

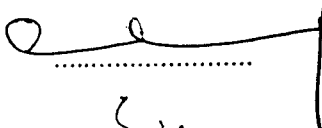
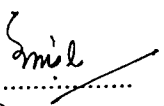
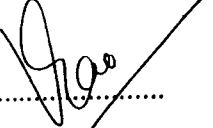
**UNITED NATIONS DEVELOPMENT PROGRAMME**  
**Project of the Government of India**

**Project Number:** IND/03/G62/AJAS/34 — 000 13049  
**Title:** Plan for of phase-out of CFCs in the Refrigeration (Mfg) Sector in India  
**Duration:** 4 years (first phase will be for 3 years)  
**Source of Funds:** AS – Implementation of the Montreal Protocol Sector Plans  
**Executing Agency:** UNDP (through the Direct Execution Modality)  
**Starting Date:** 01/03/2003  
**UNDP Inputs:** US\$ 2,000,000  
 (corresponding to the first of five funding tranches of a US\$ 2,935,986 programme)

**Brief Description:** This project will phase out all the remaining CFC consumption in the Refrigeration (Mfg) Sector in India by 31 Dec 2006. The Sector Phase-out Plan is performance-base, and while a first tranche of US\$ 2,000,000 has been approved at the 38<sup>th</sup> meeting of the Executive Committee, further funding will be made available in subsequent tranches upon achievement of the set CFC-reduction targets. If these targets are met, the total funding that will be made available to India would amount to US\$ 2,935,986. The Phase-out Plan will cover the technology conversions in all remaining eligible enterprises in the Refrigeration (Mfg) Sector except the Transport Refrigeration sub-sector (handled separately by UNIDO) and also ensure timely, sustainable and cost-effective phase-out in the Refrigeration (Mfg) Sector through a combination of investment, technical support and management components.

**Legal Context:** This project document shall be the instrument referred to in the Standard Annex to project documents as shown in Annex C and shall be governed by normal UNDP practices regarding project revisions/monitoring/evaluation and by special procurement procedures applicable to the Montreal Protocol Programme. The project will be implemented in accordance with the Agreement between the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol and UNDP signed on 21 August 1991 and the project proposal approved by the Executive Committee at its Thirty-Eighth (20-22 November 2002) Meeting in Rome, Italy, and also in accordance with the provisions of the Agreement between the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol and Government of India (Document UNEP/OzL.Pro/ExCom/38/70, Annex-X).

The annual funding tranches beginning 2003, will be released subject to confirmation that all agreed phase-out targets and consumption limits for the previous year have been achieved and a verification that the activities planned for the previous year, were undertaken in accordance with the annual implementation programme for that year. The project will be operationally closed upon submission to and acceptance by the Executive Committee, of the report of the final year's activities and achievement of the CFC phase-out targets in the Refrigeration (Mfg) Sector.

Approved by:	Signature	Date	Name and Title
UNDP		03-06-03	Maurice Dewulf Senior Deputy Resident Representative
Government		30-4-03	P.K. Deb, Joint Secy.
MOEF		7-3-03	Usha Chandrasekhar Director (Operations)



**Justice Dewitt**  
**Senior Deputy Resident Representative**

- 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
- Identification and short-listing of vendors
- International/local competitive bidding
- 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 baseline equipment

Technical assistance for these activities would be provided through UNDP international and national experts. For CY 2002, these activities would be initiated for the following enterprises/sub-sectors:

Six individually executed sub-projects covering medium-sized enterprises	64 MT ODP
Four group sub-projects covering small-sized enterprises	228 MT ODP
<b>TOTAL</b>	<b>292 MT ODP</b>

It is foreseen that the durations for the sub-projects would be set in such a way as to ensure that their completion would contribute to 100% of the verifiable annual performance target for CY 2004 (140 MT) and CY 2005 (108 MT) plus an additional about 24% of the performance target for 2006 (amounting to 44 MT) leading to a minimum phase-out of about 292 MT CFCs through the Sector Phase-out Plan. The balance of the 2006 target would be met through the second funding tranche to be obtained in 2003.

#### 4.3 Policy and Management Support Component

The implementation of the Refrigeration (Mfg) Sectoral Phase-out Plan will need to be closely aligned and coordinated with the various policy, regulatory, fiscal, awareness and capacity-building actions the Government of India is taking and will need to take in future, in order to ensure that the implementation of the Sectoral Phase-out Plan is consistent with the Country Programme principles, such as promotion of indigenization and decentralized management. Further, in view of the annual performance-based targets needed to be achieved under the terms of the Sectoral Phase-out Plan, the implementation of the Plan will need to be closely and efficiently managed and will introduce additional coordinating, reporting and monitoring activities. The following activities are envisaged, for CY 2002:

- a) Supplementing the operation of the Sector Phase-out Plan Unit (SPPU) being established under project IND/02/G66 for facilitating the management of the Sector Phase-out Plan:
  - Determination of additional personnel and logistics requirements for the SPPU.
  - Finalizing terms of reference and initiation of recruitment of additional personnel as may be required
- b) Formulation of detailed terms of reference and work plans for various activities under the Policy & Management Support component.
- c) Establishment of an operational mechanism for participation by enterprises in the Sector Phase-out Plan and for obtaining phase-out commitments from enterprises.
- d) Organization of one workshop under the Policy and Management Support Component.

More information on the operational responsibilities of the SPPU and other stakeholders for the implementation of the Plan is provided in the Operational Mechanism for Implementation (OMI) previously finalized for project IND/02/G66 – Foam Sector Phase-out Plan.

## 5. TECHNOLOGY

(See full-fledged project document approved at the 37<sup>th</sup> ExCom meeting including all phases)

## 6. FUNDING

BL	Cost Header	EX Mod	Approved Total Budget	First tranche Budget TOTAL	First tranche Budget for 2003	First tranche Budget for 2004	First tranche Budget for 2005
11.51	International Consultants	UNOPS	200,000	50,000	40,000	5,000	5,000
13.01	SPPU -- Support Staff	DEX	30,000	10,000	5,000	3,000	2,000
15.01	SPPU -- Local Travel	UNOPS	40,000	10,000	5,000	3,000	2,000
17.01	SPPU -- National Programme Manager	UNOPS	100,000	25,000	20,000	3,000	2,000
21.01	National Subcontract for technical assistance	UNOPS	150,000	40,000	30,000	5,000	5,000
21.02	Trials (will be provided from future tranches)	DEX	104,050	0	0	0	0
31.01	SPPU - Workshops and Awareness	DEX	40,000	10,000	5,000	3,000	2,000
45.01	Incremental Operating Costs (from future tranches)	DEX	0	0	0	0	0
45.02	Equipment	DEX	2,000,000	1,780,000	1,500,000	200,000	80,000
53.01	SPPU - Operational Expenditures	DEX	50,000	15,000	10,000	3,000	2,000
53.02	Contingencies	DEX	221,936	60,000	50,000	5,000	5,000
<b>99.00</b>	<b>Total</b>		<b>2,935,986</b>	<b>2,000,000</b>	<b>1,665,000</b>	<b>230,000</b>	<b>105,000</b>

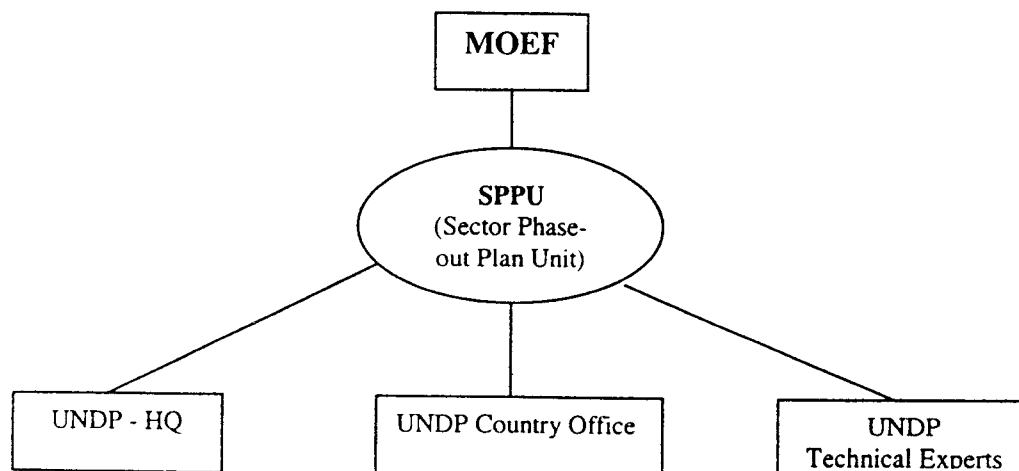
Notes: - All SPPU components amount to US\$ 260,000 for all tranches and US\$ 70,000 for the first tranche. The funding for the SPPU through the budget lines above, is supplemental to the funding provided in the project IND/02/G66 - Foam Sector Plan  
 - All amounts in US\$ and exclude UNDP's support costs

## 7. RESULTS

This first phase will eliminate about 292 MT/y of CFC consumption in the Refrigeration (Mfg) Sector in India, by end-2005.

## 8. IMPLEMENTATION MODALITY

The programme will be implemented using the Direct Execution Modality (DEX). As such, the programme will be implemented using the following structure:



The roles and responsibilities for the stakeholders would be in accordance with the Operational Mechanism for Implementation (OMI), previously finalized for the project IND/02/G66 - Foam Sector Phase-out Plan.

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

**PROJECT COVER SHEET**

<b>COUNTRY</b>	INDIA	<b>IMPLEMENTING AGENCY</b>	UNDP
<b>PROJECT TITLE</b>	Plan for Phase-out of CFCs in the Refrigeration (Manufacturing) Sector in India – except Transport Refrigeration sub-sector ( <b>Phase 1</b> )		
<b>PROJECT IN CURRENT BUSINESS PLAN</b>	Yes		
<b>SECTOR SUBSECTOR</b>	Refrigeration Refrigeration (Mfg) except Transport Ref.		
<b>ODS USE IN SECTOR</b>	Baseline (Average of 1995-97)	2,770	MT ODP
	Current (2000)	2,000	MT ODP
	From funded ongoing projects	809	MT ODP
	From remaining non-eligible enterprises	29	MT ODP
	From remaining eligible enterprises	428	MT ODP
	Net remaining	450	MT ODP
<b>PROJECT IMPACT (Total programme)</b>	(Reflecting net ODP value)	428	MT ODP
<b>PROJECT IMPACT (1<sup>st</sup> Tranche)</b>		292	MT ODP
<b>PROJECT DURATION (Total programme)</b>		48	months
<b>PROJECT DURATION (1<sup>st</sup> Tranche)</b>		36	months
<b>PROJECT COSTS</b>	Total Grant	US\$	2,935,986
<b>PROJECT COSTS (1<sup>st</sup> Tranche)</b>	Incremental Capital Costs	US\$	2,000,000
<b>LOCAL OWNERSHIP</b>			100%
<b>EXPORT COMPONENT</b>			0%
<b>FUNDING</b>		US\$	2,000,000
<b>COST EFFECTIVENESS</b>		US\$/kg/y	6.85
<b>IMPLEMENTING AGENCY SUPPORT COSTS</b>		US\$	172,971
<b>TOTAL COST OF PROJECT TO MULTILATERAL FUND</b>		US\$	2,172,971
<b>STATUS OF COUNTERPART FUNDING</b>			N/A
<b>PROJECT MONITORING MILESTONES</b>			Included
<b>NATIONAL COORDINATING BODY</b>			Ministry of Environment & Forests

**PROJECT SUMMARY**

This project will phase out all the remaining CFC consumption in the Refrigeration (Mfg) Sector in India by 31 Dec 2006. The Sector Phase-out Plan is performance-based and while a first tranche of US\$ 2,000,000 has been approved at the 38<sup>th</sup> meeting of the Executive Committee, further funding will be made available in subsequent tranches upon achievement of the set CFC-reduction targets. If these targets were met, the total funding that will be made available to India would amount to US\$ 2,935,986. The Phase-out Plan will cover the technology conversions in all remaining eligible enterprises in the Refrigeration (Mfg) Sector, except the Transport Refrigeration sub-sector (which is handled by UNIDO) and also ensure timely, sustainable and cost-effective phase-out in the Refrigeration (Mfg) Sector through a combination of investment, technical support and management components. The first phase of the program will cover establishment of the Sector Phase-out Plan Unit (SPPU) for the management and coordination of the phase-out activities and initiation of enterprise-level CFC phase-out activities in the Refrigeration (Mfg) Sector leading to elimination of about 140 MT of CFCs by 2004, 108 MT by 2005 and about 44 MT of CFCs in 2006.

**IMPACT OF THE PROJECT ON THE COUNTRY'S MONTREAL PROTOCOL OBLIGATIONS**

The approval of this project will help India in meeting its Montreal Protocol obligations, such as the phased reductions in ODS consumption as per the agreed schedules.

**PREPARED BY** Nandan Chirmulay, UNDP Expert

**DATE** February 2003

**PROJECT OF THE GOVERNMENT OF INDIA**  
**Phase-out Plan for the elimination of CFCs in the Refrigeration (Mfg) Sector in India**

## **1. PROJECT OBJECTIVES**

A. The objectives of the overall programme (all phases) are:

- a) To achieve complete phase-out of CFCs in the Refrigeration (Mfg) Sector in India by end-2006.
- b) To enable India 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 in the Refrigeration (Mfg) Sector, through development and implementation of a combination of investment, technical support and management components.

B. The objectives related to the first phase of the programme are:

- a) Establishment and operation of the Sector Phase-out Plan Unit (SPPU) for facilitating the management of the Sector Phase-out Plan:
- b) Formulation of detailed terms of reference and work plans for various activities under the Policy & Management Support component.
- c) Establishment of an operational mechanism for participation by enterprises in the Sector Phase-out Plan and for obtaining phase-out commitments from enterprises.
- d) Organization of one workshop under the Policy and Management Support Component.
- e) Implementation activities at enterprise-level, corresponding to a phase-out of about 292 ODP tones over duration of 36 months.

Another four funding tranches will be approved in subsequent years and will result in achieving the overall objective described in subparagraph A above.

## **2. INSTITUTIONAL FRAMEWORK**

(See Full-Fledged project document approved at the 38<sup>th</sup> ExCom meeting including all phases)

## **3. SECTOR BACKGROUND**

(See Full-Fledged project document approved at the 38<sup>th</sup> ExCom meeting including all phases)

## **4. PROJECT DESCRIPTION**

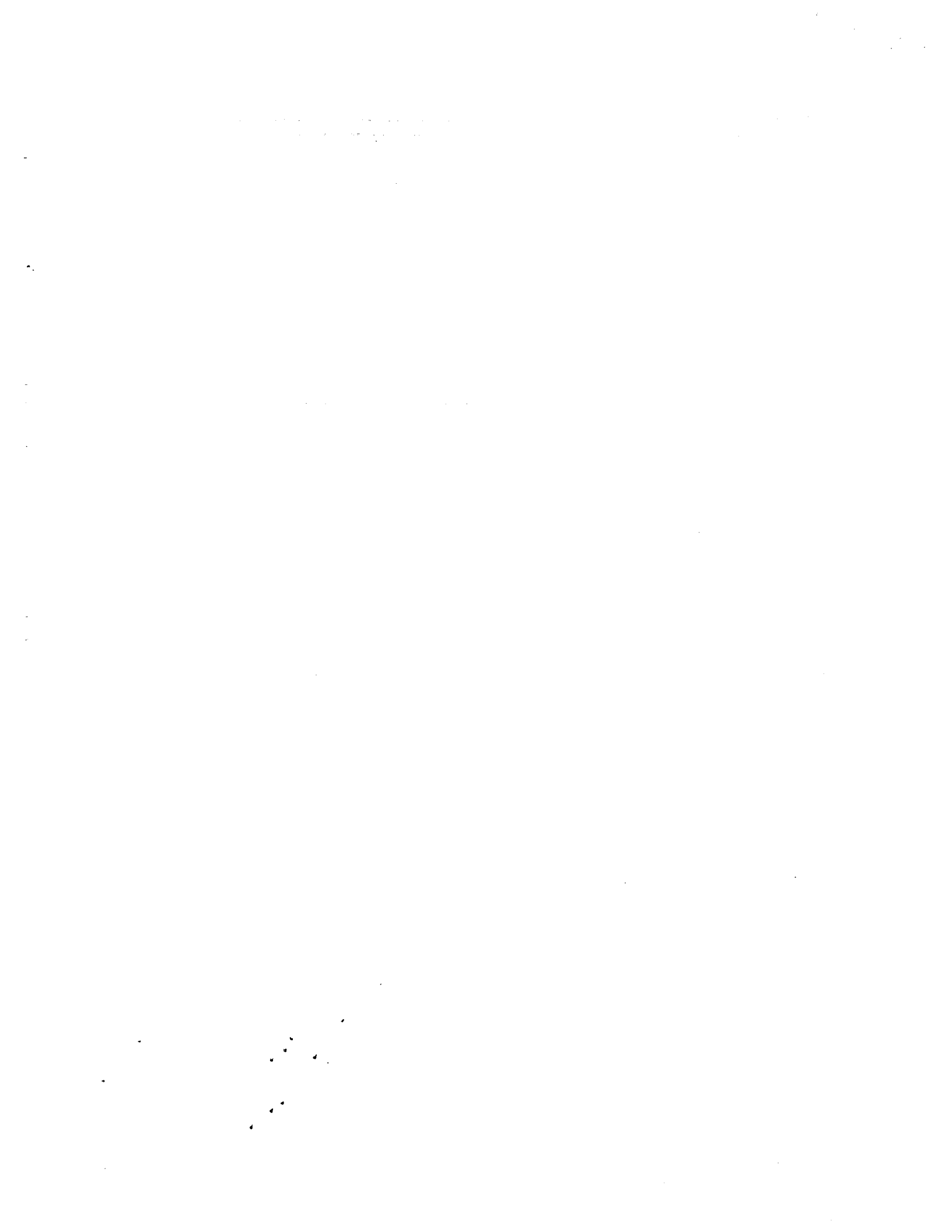
The Sectoral Phase-out Plan for elimination of CFCs in the Refrigeration (Mfg) Sector in India will be implemented through a combination of investment, technical support and management components (See Full-Fledged project document approved at the 37<sup>th</sup> ExCom meeting including all phases). The activities to be summarized in CY 2002 are summarized as below:

### **4.1 Investment Component**

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

## **9. REPORTING AND OBTAINING FUNDING FOR FOLLOWING TRANCHES.**

A yearly progress report will be prepared, showing the progress made in the project activities and reporting on the CFC-phase-out amounts that have been achieved. The information regarding the targets to be achieved on a yearly basis are stipulated in the official agreement between the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol and India - Document UNEP/OzL.Pro/ExCom/38/70, Annex-X.





**INDIA**

**FOAM AND REFRIGERATION (MFG) SECTOR PHASE-OUT PLANS**

**Operational Mechanism for Implementation**

Revised: 24 February 2003

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## 1. INSTITUTIONAL FRAMEWORK

### 1.1 INTRODUCTION

This document describes the Operational Mechanism for Implementation (OMI) for the Sector Phase-out Plans for CFCs in the Foam and Refrigeration (Mfg) Sectors in India and the roles and responsibilities of the Government of India (GOI), United Nations Development Programme (UNDP) and the prospective Recipient Enterprises (CFC consuming enterprises to be covered under this Plans).

The OMI has been prepared by UNDP in collaboration with the Ozone Cell, Ministry of Environment and Forests, Government of India (hereinafter referred to as "MOEF") for implementation of the Sector Phase-out Plans for CFCs in the Foam and Refrigeration (Mfg) Sector.

The OMI should be read in conjunction with the following documents:

Agreements between the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol - Document UNEP/OzL.Pro/ExCom/37/71, Annex-VII and UNEP/OzL.Pro/ExCom/38/70, Annex-X

- Approved project documents for the projects "IND/02/G66 - Sectoral Phase-out Plans for Elimination of CFCs in the Foam Sector in India" and "INS/03/G62 - Plans for Phase-out of CFCs in the Refrigeration (Mfg) Sector in India"

This OMI is not intended to supersede any of the existing legal and other obligations or new legal or other obligations emanating from the above documents, of the Government of India. It is to be considered as a dynamic and evolving document and may be revised as required during the course of implementation of the project.

### 1.2 BACKGROUND

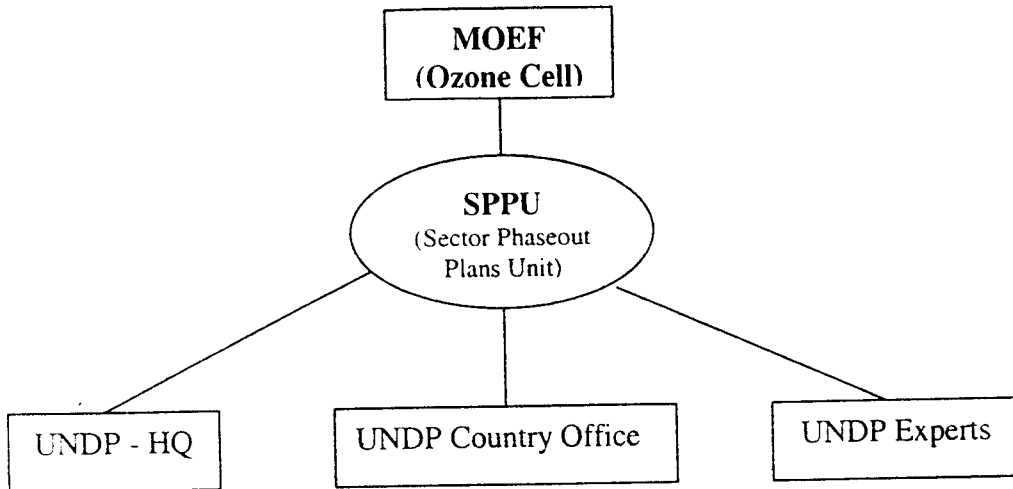
On behalf of Government of India (GOI), UNDP submitted proposals entitled "Sectoral Phase-out Plans for Elimination of CFCs in the Foam Sector in India", in July 2002 and "Plans for Phase-out of CFCs in the Refrigeration (Mfg) Sector in India" in November 2003, to the Executive Committee (ExCom) of the Multilateral Fund (MLF) for Implementation of the Montreal Protocol for the phase-out of Ozone Depleting Substances (ODS). The proposals were reviewed and evaluated by the Multilateral Fund Secretariat (MLFS) and were approved by ExCom respectively at its 37<sup>th</sup> Meeting in July 2002 and 38<sup>th</sup> Meeting in December 2002. The projects provide India with an overall framework for phase-out of CFCs in the Foam and Refrigeration (Mfg) Sectors within the time frame provided by the Montreal Protocol (by 31 December 2006) and generate additional responsibilities and obligations for GOI in implementation and management of the project. The projects comprise funding agreements over the duration of the projects and link stipulated annual CFC phase-out targets to annual funding tranches. The funding includes provisions for incremental costs for Investments, Technical Support and Policy & Management Support.

The main characteristics of the Sector Phase-out Plans for the Foam and Refrigeration (Mfg) Sectors in India are as follows:

- The responsibility for meeting the agreed annual CFC phase-out and consumption levels in the Foam and Refrigeration (Mfg) Sectors rests with GOI.
- It incorporates reporting mechanisms for GOI (MOEF/Ozone Cell) for disbursement of agreed annual funding tranches. In accordance with the agreement, Annual Implementation Programs will need to be developed for each calendar year and submitted to the last ExCom meeting in the preceding year. Through its endorsement of the Annual Implementation Programs and subject to achievement of agreed annual targets in the preceding year, ExCom will approve and release the annual grant tranches.
- It incorporates verification of achievement of annual CFC phase-out and consumption targets in the Foam and Refrigeration (Mfg) Sector and that the associated policy actions, technical support and training activities have been carried out according to the Annual Implementation Program.

### 1.3 ROLES AND RESPONSIBILITIES OF STAKEHOLDERS

This section outlines the roles and responsibilities of respective stakeholders in the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans. The major stakeholders, who will be involved in the implementation, are as in the following diagram:



#### 1.3.1. Short description / definition of the stakeholders.

##### A) Ministry of Environment and Forests (MOEF)

MOEF is the designated ministry responsible for implementation of Montreal Protocol in India. MOEF – through its Ozone Cell -- will carry out its responsibilities within the following institutional framework:

- ♦ Empowered Steering Committee: Chaired by the Secretary, MOEF, for coordination at the national level for meeting India's obligations under the Montreal Protocol supported by three standing committees:
- ♦ Technology and Finance Standing Committee (TFSC): For providing policy and technical guidance, direction and oversight to the overall Montreal Protocol program.
- ♦ Standing Committee for Small Scale Industry (SCSSI): Entrusted with advising on ODS phase-out and compliance by the crucial small industries sector
- ♦ Standing Committee for Monitoring and Evaluation (SCME): For advising on and monitoring of implementation.

B) Sector Phase-out Plans Unit (SPPU): To be established under the Ozone Cell (MOEF), with the assistance of UNDP, for management and coordination of the Sector Phase-out Plans. The detailed terms of reference for the staff for constituting the SPPU are attached as Annex-2. The SPPU will facilitate implementation of Sector Phase-out Plans.

C) UNDP-HQ / UNDP-CO: As the implementing agency for the Foam and Refrigeration (Mfg) Sector Phase-out Plans, UNDP will be implementing the programme using the Direct Execution Modality (DEX). It's Montreal Protocol Unit in New York has been actively involved in the project preparation phase, will guide the overall implementation process, guide the UNDP Country Office whenever needed, finalize / submit the yearly progress reports and defend them at the meetings of the Executive Committee of the Multilateral Fund, to obtain the subsequent funding tranches of the programme. UNDP's Country Office located in New Delhi will liaise closely with the SPPU to carry out the implementation of the project activities.

#### 1.3.2. Role of the Stakeholders.

The role of each of the stakeholders in each of the anticipated project implementation activities is provided in the following table. Each stakeholder's involvement is indicated as high "h", medium "m" or low "l". The stakeholder bearing responsibility for a given activities is indicated with a capital "H".

ACTIVITY	MOEF	UNDP-HQ	UNDP-CO	SPPU	Experts
Ownership of the programme and leader of the programme, all monitoring functions	H				
Setting up operational procedure for participation of recipient enterprises	H			l	l
Overall responsibility for monitoring and supervision of implementation activities with the assistance of UNDP	H	h		h	m
Project Preparation Activities, business Plansing, Plans visits of consultants, negotiate with MLF Secretariat and ExCom, liaison with MOEF.	M	H	l		H
Inform MLF Secretariat and ExCom about status in yearly progress report for MLF	M	H	l		H
Obtain funding from MLF Treasurer, finalization of prodoc, negotiating implementation arrangements	L	H	l		l
Drafting TOR's and managing for SPPU and consultants	L	H	l		m
Managing of SPPU activities and consultants		m	H		
Cooperation with UNDP-Experts		l	l	H	H
Recruitment International consultants		H	l		
Recruitment National consultants / payments of nat. personnel / F10		H	H		l
Obtain signatures for prodocs / yearly tranches	M	m	H		
Process budget revisions		m	H		
Organize/participate in supervision missions, monitoring meetings / standing committees / TPR's	H	l	H	h	m
Enforcement of the ODS Regulations in relation to this project	H			m	m
Supervision of other activities, such as public information and awareness initiatives, training programs, as needed.	M			H	m
Provide advice and resolve eligibility issues related to MLF	L	H			m
Establishing mechanism of RC participation in the Sector phase-out Plans and in determining the sequence of RC participation	L		l	H	m
Provide Technical advise to recipient enterprises on industrial conversion process					H
Carry out visits at these enterprises on a regular basis and report on progress				H	H
Preparation of specifications, terms of reference and vendor shortlists			l	H	H
Preparation of Invitations to Bid (ITBs), carrying out international/local competitive bidding exercises for equipment/services + opening of bids			H	h	H
Finalization of vendor selections, evaluation of bids/vendors			h	H	H
Submission of documentation related to procurement-preparation			l	H	
Contracts Committee (local or HQ depending on size)		H	m		
Issuance of Purchase Orders & payment to vendors / recipients			H	h	l
Arranging customs clearance of internationally procured equipment			H	l	l
Ensuring local distribution of equipment to the recipient enterprises			l	m	H
Ensuring implementation of the Local Works needed to install equipment				l	H
Ensuring production start-up with CFC-free technology, Test Trials				l	H
Monitoring and supervising enterprise-level CFC phase-out and baseline equipment disposal, including any required inspection visits to RCs				h	H
Carrying Out payments for incr. Operational costs if applicable			H	l	
Collection of official affidavits/SOC upon respective enterprise phaseout protocols	L			H	H
Arranging verification audits of Annual Implementation Programs		H	l	h	H
Providing inputs for preparation of Annual Implementation Programs / progress reports to UNDP		m	l	H	m
Review of yearly progress reports, and action Planss, negotiate with MLF Secretariat and ExCom on obtaining next funding tranche, finalization of yearly prodoc corresponding to tranche.	L	H	l	h	H
Cooperating with supervision and audit verification teams or with independent reviewers appointed by ExCom, to verify the findings of the audits	H	m	l	H	m

H: high involvement and having lead responsibility for the activity concerned

h: high involvement

m: medium involvement

l: low involvement

### 1.3.3 Role of the Recipient Enterprises

While the recipient enterprises are not considered as a stakeholder in carrying out the implementation of the project per sé, they also play a key-role as the recipient of the project activities. The obligations and responsibilities of each of the recipient enterprises participating in the Sector Phase-out Plans will include the following:

- Designating a contact person for the project
- Undertaking to be available for interacting and cooperating with Ozone Cell/SPPU and UNDP
- Providing all documentation and declarations as may be required by MOEF for participation in the Sector Phase-out Plans in the prescribed format
- Agreeing to the specifications, terms of reference and vendor shortlists prepared by UNDP/SPPU experts
- Preparing the sites and completing all required local works for installation of equipment procured and provided to the enterprise under the terms of participation in the Sector phase-out Plans
- Ensuring the installation and commissioning of all equipment and services including all changes to the production operations for ensuring phase-out of CFCs, in cooperation with the suppliers and in accordance with the terms of reference provided
- Undertaking to irrevocable phase-out of CFCs upon completion of the project and in accordance with the agreed schedule
- Ensuring that the CFC-based baseline equipment replaced under the project is irrevocably rendered unusable with CFCs
- Undertaking to maintain production and other related records and make them available for review and verification as may be required
- Providing inputs to SPPU and UNDP for preparing project completion reports as may be required Accepting supervision/inspection teams from SPPU/MOEF, relevant government agencies and UNDP, as well as designated experts and verification/audit teams
- Complying with all laws and regulations related to the Montreal Protocol promulgated by GOI including the ODS (Regulation) Rules
- Participating in workshops/meetings as called for by SPPU/UNDP

## 2. OPERATIONAL PROCEDURES

### 2.1 ANNUAL IMPLEMENTATION PROGRAMS

#### 2.1.1 Preparation

For each year of the duration of the Sector Phase-out Plans, UNDP, in cooperation with the SPPU, will prepare an Annual Implementation Program for the calendar-year period and following its review and clearance by Ozone Cell/MOEF, will submit it to the last ExCom meeting of the preceding year. Upon approval by ExCom, the annual grant tranche will be transferred from the MLF to UNDP. Disbursement of funds from UNDP will be subject to release of funds from MLF. The Annual Implementation Program will include:

- Review of the preceding year's Annual Implementation Program, detailing realization of CFC phase-out targets, progress of implementation of all activities and status of disbursements
- Monitoring indicators
- Details of activities proposed to be carried out
- Amounts and schedule of disbursements
- Request for funding allocation from annual grant tranche
- Confirmation by UNDP that the preceding year's targets have been satisfactorily met

#### 2.1.2 Inputs from SPPU

SPPU will provide the following inputs to UNDP for the Annual Implementation Programs:

#### Reporting for the preceding year:

- Actual CFC phase-out achieved at enterprise level
- Agreed remedial actions for the current year, in the event CFC phase-out targets in the preceding year were not met
- Report on all other activities undertaken

#### Plans for the current year:

- CFC phase-out expected from participating enterprises
- Annual grant tranche for the year and budget estimates for each of the activities
- Projected disbursement schedules and amounts
- Monitoring Indicators

### 2.1.3 Verification and certification

#### By Ozone Cell/MOEF

Ozone Cell/MOEF will commission independent technical auditors, such as Chartered Engineers or similar authorized entities to verify and certify that all project inputs have been provided at enterprise level, the agreed CFC phase-out has been established and all other obligations have been met by the recipient enterprise(s). The terms of reference for such audit will be developed in consultation with UNDP.

#### By UNDP

UNDP shall carry out final inspection, verification and certification of the project inputs at enterprise level to establish completion of all activities and disposal of replaced CFC-based equipment and to establish that the agreed CFC phase-out has been achieved. UNDP shall also carry out independent verification and certification of all other activities envisaged in the annual implementation program.

## 2.2 PROCUREMENT

The international and local procurement of equipment and services required in the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans, jointly by UNDP and SPPU, through an integrated Procurement Support Group comprising of designated representatives and experts from SPPU and UNDP. The procurement procedures are described in more detail in Annex-3. The respective distribution of responsibilities for procurement activities would be as below:

### 2.2.1 SPPU Responsibilities

- Preparation and finalization of terms of reference, scope, specifications of and vendor short-lists for equipment & services to be procured, in consultation with the respective recipient enterprises and with the support of designated UNDP technical experts
- Objective and transparent techno-commercial evaluation of bids received from the vendors and recommendation of the technically acceptable vendor offering the lowest prices

### 2.2.2 UNDP Responsibilities

- Issuance of Invitations to Bid to the short-listed vendors as advised by SPPU
- Opening of Bids and sending the bids to SPPU for evaluation
- Issuance of Purchase Orders/Contracts to the selected vendors
- Effecting payments to the selected vendors in accordance with the terms of the purchase orders/contracts, upon authorization by SPPU
- Arranging customs clearance and delivery of internationally procured equipment to the respective recipient enterprises

## 2.3 DISBURSEMENT

The disbursement of the funding for the Foam and Refrigeration (Mfg) Sector Phase-out Plans is governed by the agreement between GOI and the Executive Committee (UNEP/OzL.Pro/ExCom/37/71). The flow of funds for the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans is summarized below:

### 2.3.1 From MLF to UNDP

Upon ExCom approval of the Annual Implementation Program, the approved grant tranche for each year will be transferred from the MLF to UNDP subject to fund availability at MLF. This will include all project funds covering the incremental capital costs for the investment and policy & management support components, the approved incremental operating costs and agency fees.

### 2.3.2 From UNDP to SPPU

The approved funding tranche for each year, covering the Policy and Management Support Component in the Foam and Refrigeration (Mfg) Sector Phase-out Plans, would be disbursed by UNDP to SPPU in accordance with UNDP financial rules and procedures, upon submission by SPPU to UNDP, the required requisitions for activities to be undertaken by SPPU under the Foam and Refrigeration (Mfg) Sector Phase-out Plans. The salaries of SPPU staff and SPPU capital and operational expenses shall be disbursed by UNDP in accordance with the contractual terms and applicable UNDP rules and procedures.

### 2.3.3 From UNDP to Suppliers

UNDP will effect payments to international and local suppliers of equipment and services, procured under the Foam and Refrigeration (Mfg) Sector Phase-out Plans, in accordance with the agreed contractual terms and in line with procurement procedures for the Foam and Refrigeration (Mfg) Sector Phase-out Plans detailed in Annex-3, upon endorsement by SPPU.

### 2.3.4 From UNDP to Recipient Enterprises

All eligible reimbursements of expenses and eligible incremental operating costs as approved in the Foam and Refrigeration (Mfg) Sector Phase-out Plans, shall be disbursed directly by UNDP to the recipient enterprises, upon receiving an endorsement from SPPU that the endorsed amounts are reasonable and eligible and that the required supporting documentation in accordance with the agreed terms between Ozone Cell/MOEF and the recipient enterprises has been provided and reviewed.

## 3. MONITORING & REPORTING

The Ozone Cell/MOEF will have the overall responsibility for monitoring the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans. The monitoring indicators for outputs at the national and enterprise levels would be as below:

### 3.1 NATIONAL LEVEL MONITORING INDICATORS

- Annual domestic production level of CFCs
- Annual domestic consumption of CFCs in the Foam and Refrigeration (Mfg) Sector
- Annual maximum permissible consumption level of CFCs in the Foam and Refrigeration (Mfg) Sector
- Annual CFC phase-out targets as prescribed in the Annual Implementation Program
- Annual CFC phase-out actually achieved in the Foam and Refrigeration (Mfg) Sector
- Annual fund disbursements from the Sector Phase-out Plans
- Data reporting obligations under Article-7 of the Montreal Protocol



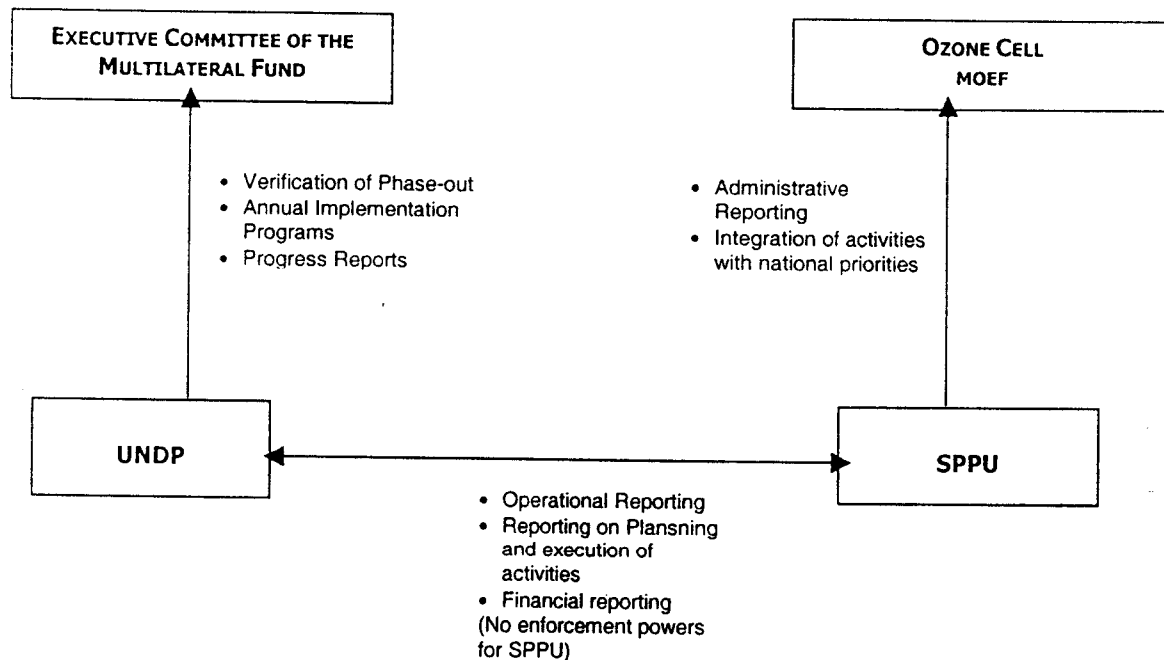
- Promulgation of any new policies and regulations pertaining to the Foam and Refrigeration (Mfg) Sector phase-out Plans
- Implementation status and effectiveness of policies and regulations pertaining to the Foam and Refrigeration (Mfg) Sector Phase-out Plans

### 3.2 ENTERPRISE LEVEL MONITORING INDICATORS

- Baseline CFC consumption figures for enterprises with ongoing (under implementation) conversion projects under the Montreal Protocol
- Baseline CFC consumption figures for enterprises participating in the Sector Phase-out Plans
- CFC phase-out targeted at enterprise levels, in the Annual Implementation Programs
- CFC phase-out achieved at enterprise level

### 3.3 ADMINISTRATIVE REPORTING

The following figure illustrates the proposed administrative reporting mechanism:



## ANNEX-1

### FORMAT FOR PARTICIPATION AGREEMENT WITH RECIPIENT ENTERPRISES TO BE COVERED UNDER THE FOAM AND REFRIGERATION (MFG) SECTOR PHASE-OUT PLANS

Ozone Cell  
Ministry of Environment & Forests  
New Delhi, India

Dear Sirs,

#### PHASE-OUT OF CFCs IN THE MANUFACTURE OF (SUB-SECTOR) FOAM AND REFRIGERATION (MFG)

In connection with the above we hereby confirm the following:

- 1) a) We presently consume polyurethane chemicals in our production of (sub-sector) Foam and Refrigeration (Mfg). We procure these chemicals mainly from local chemical suppliers who have been helping and advising us regarding the usage of these chemicals to enable us to maintain the properties of our end products and meet our customer's requirements economically. We understand that these polyurethane chemicals contain CFCs, which have to be phased out in future, as per international agreements.
- b) We have been assured by our chemical suppliers that they will be able to supply us the alternative chemicals that will give us the desired quality of end products. We understand that our present technology and process may not be suitable for working with the alternative chemicals and that we may be eligible to receive equipment suitable for handling the alternative chemicals, which may be made available to us under the supervision of MOEF/UNDP.
- c) We are agreeable to participate in a group/sectoral project covering enterprises similar to us producing Foam and Refrigeration (Mfg), with the aim of phasing out CFCs. Under this project, we understand that we may be eligible to receive equipment, trial materials, training, technical assistance, etc.
- d) We agree to accept the equipment and selected conversion technology recommended by UNDP/MOEF as per specifications to be developed by them. We also agree that MOEF/UNDP may make any required technical decisions affecting the technology selection, to ensure that project objectives are achieved and the selected technology can be applied in accordance with established industrial standards and practices for operation and environmental & occupational safety.
- e) We understand and accept that the Government of India and UNDP will make a determination of the amount of funding we will be eligible to receive, in order to effect phase-out of CFCs.

- 2) We confirm the following baseline information about our enterprise:

Consumption of CFC-based chemicals: \_\_\_\_\_ MT (for CY 2000)  
Baseline equipment/process: Hand-mixing/Low-pressure dispenser/High-pressure dispenser  
Date of Establishment/Registration:  
Date of commencement of commercial production:  
Name of Proprietor/Partner/Managing Director:  
Address of Registered Office/Proprietor/Partner:  
Address of factory where CFC phase-out will be implemented:

- 3) We hereby undertake:
  - a) To bear any costs required for successful conversion to fully CFC-free technology over and above the approved funds.
  - b) To discontinue the use of CFCs and to dispose all redundant baseline equipment replaced under the project, upon project completion and to allow monitoring inspections by Government of India and/or UNDP or their designated representatives during project implementation and after project completion, to verify the same.
  - c) To assume all liabilities which may arise throughout the conversion process.

This letter may be treated as our formal application and confirmation of our baseline data, for seeking assistance from the Multilateral Fund of the Montreal Protocol for phasing out of CFCs in our manufacturing process.

**(Signed)**  
**Authorized Signatory**

## ANNEX-2

### TERMS OF REFERENCE FOR SPPU STAFF

#### 1. NATIONAL PROGRAMME MANAGER

The mandate of the Sector Phase-out Plans Management & Coordination Unit (SPPU) would be to assist the Ozone Cell, Ministry of Environment and Forests (MOEF) and UNDP for implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans, involving CFC phase-out at CFC-consuming enterprises in the Foam and Refrigeration (Mfg) Sector, through a combination of Investment and Policy & Management Support components, and to facilitate achievement of the CFC phase-out schedule in the Foam and Refrigeration (Mfg) Sector in India, in accordance with the agreement between GOI and MLF Executive Committee (UNEP/OzL.Pro/ExCom/37/71, Annex-VII). UNDP is the designated implementing agency for this project and will provide the required technical and infrastructural support for the implementation of the Sector Phase-out Plans. The Coordinator of the SPPU will have overall operational responsibility for the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans.

#### Duties and responsibilities

The Coordinator will be responsible for regular review and implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans and is expected to discharge the following functions:

- Supervise the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans under the guidance of Director, Ozone Cell and UNDP.
- Work in close coordination with UNDP experts and recipient enterprises
- Act as an interface between UNDP, MOEF and other relevant organizations/departments on activities relating to the SPPU.
- Assist Ozone Cell in verification of baseline CFC consumption levels and CFC phase-out at the enterprise level
- Prepare periodic reports for the Ozone Cell to be submitted to various stakeholders including MOEF and UNDP
- Assist Ozone Cell in implementation and enforcement of policies and regulations as per the ODS (Regulation) Rules, 2000.
- Assist UNDP in preparing the Annual Implementation Programs
- Manage and monitor activities performed by the other SPPU professional and general staff.
- Perform other duties within the purview of the project as assigned by Ozone Cell/UNDP.

#### Qualifications and Experience

- A Master's degree in Environment/Life Sciences, Engineering or Chemistry is required. A Doctoral or Management degree is desirable.
- Minimum fifteen years working experience in Government, Public Sector, Multilateral Organizations or NGOs is required.
- Minimum ten years experience in management and administration of environmental projects and activities.
- Thorough knowledge and understanding of the Montreal Protocol financial mechanism and the Multilateral Fund policies, guidelines and procedures.

#### Salary

Negotiable based on qualifications and experience

#### Duration

One year (renewable)

#### Location



**2. OPERATIONS ASSISTANT**

(Terms of reference to be developed)

**3. OFFICE ASSISTANT**

(Terms of reference to be developed)

## ANNEX-3

### PROCUREMENT PROCEDURES

The following is a brief description of the elements of the procedural regime, which would be followed for international and local procurement of equipment and services required for the implementation of the Foam and Refrigeration (Mfg) Sector Phase-out Plans:

#### INTRODUCTION

The procurement activities will be carried out by UNDP supported by an integrated Procurement Support Group (PSG). The PSG team will comprise of the following:

- Coordinator of the SPPU
- One designated UNDP staff experienced in procurement
- One designated UNDP international technical expert
- One designated UNDP national technical expert
- One designated UNDP program staff

The Procurement Support Group will assist the SPPU in arranging the international and local procurement of equipment and services required for executing the Foam and Refrigeration (Mfg) Sector Phase-out Plans in a transparent and accountable manner. The various procurement actions will be initiated upon signature of the project document by GOI and UNDP and receipt by UNDP of the annual disbursement tranche from MLF

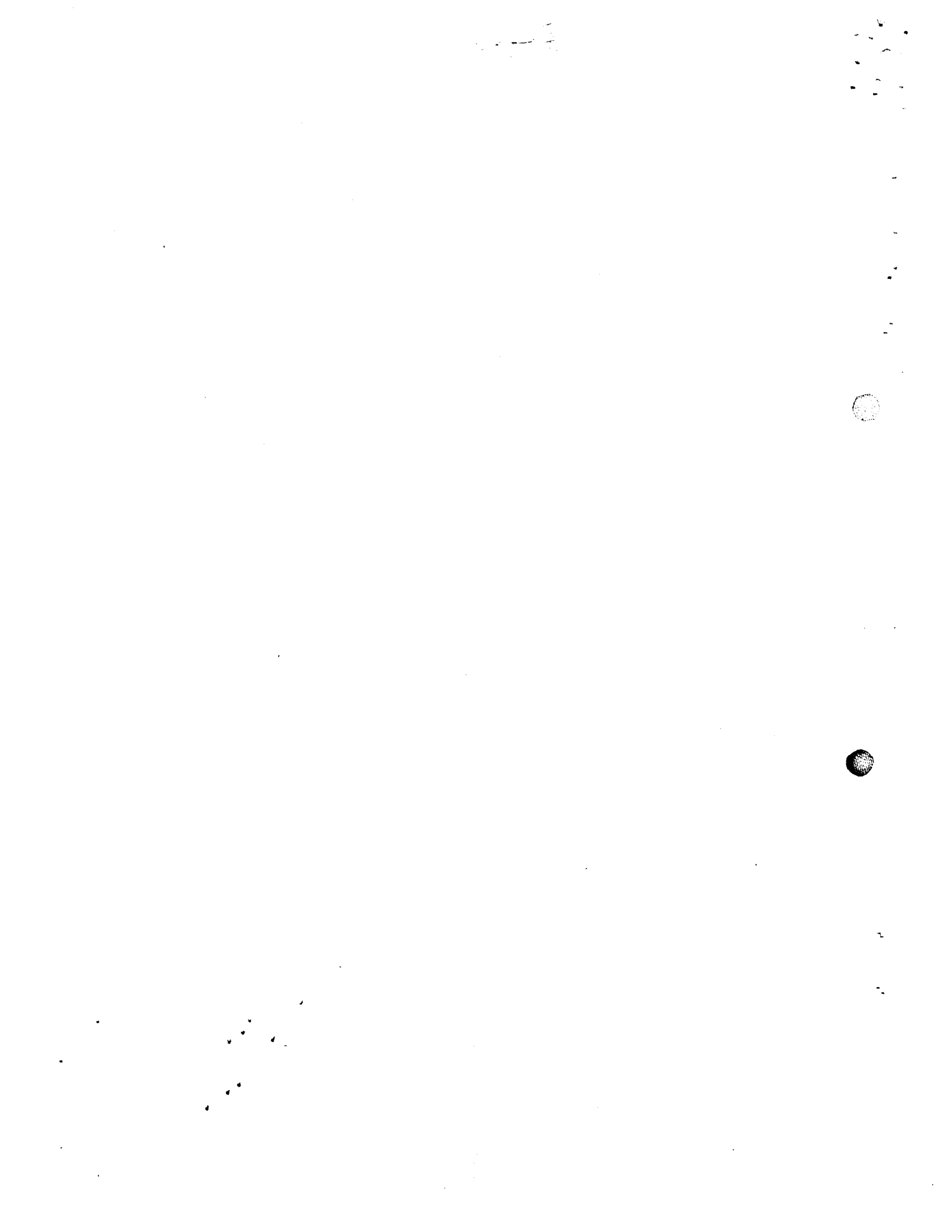
#### INTERNATIONAL PROCUREMENT

- The technical requirements of conversion to non-CFC technology at each enterprise, would be assessed by UNDP experts. Based on the same, the scope, technical specifications of the equipment and short-list of vendors would be developed by UNDP experts. A minimum of five reputed international vendors from a minimum of three countries will be short-listed. The specifications shall be clear and unambiguous to the maximum extent possible and shall incorporate the most cost-effective technical options, required for effecting CFC phase-out. The PSG will endorse the specifications and vendor short-lists.
- Concurrence of the recipient enterprises, to the specifications and vendor short-lists may be obtained by SPPU to the extent possible.
- The SPPU will formally forward the specifications and vendor short-lists to UNDP's procurement office.
- UNDP's procurement office will issue the Invitations to Bid (ITB) to the short-listed vendors, and may at its discretion to additional vendors. The vendors shall be provided a minimum of 21 days from the date of issuance of the ITB for submitting the bids. No extensions to the date for submitting the bids will be granted under any circumstances, except Force Majeure.
- On the stipulated date of submission of the Bids, the UNDP procurement office shall conduct a public opening of bids and forward the bids to the PSG.
- The PSG will then prepare a report consisting of an objective and independent techno-commercial evaluation, analysis and comparison of the bids received and recommendation of the successful bidder. The technically acceptable bidder offering the lowest prices shall be recommended. Some of the factors to be considered in such an evaluation are, the compliance of the bid with the specifications, reliability of the supplier with regard to product quality, industry reputation and financial stability, local availability of spare parts and service, etc.
- The SPPU will formally forward the bid evaluation report(s) along with recommendations to UNDP's procurement office.
- UNDP's procurement office will issue the purchase order/contract to the recommended vendor.

## **LOCAL PROCUREMENT**

All procedures would be similar to international procurement with the following exceptions:

- The vendor short-list will comprise of a minimum of three reputed indigenous vendors
- The vendors shall be provided a period of minimum of fifteen days from the date of issuance of the ITB, for submission of bids





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

**PROJECT COVER SHEET**

<b>COUNTRY</b>	INDIA	<b>IMPLEMENTING AGENCY</b>	UNDP, UNIDO	
<b>PROJECT TITLE</b>	Plan for Phase-out of CFCs in the Refrigeration (Manufacturing) Sector in India			
<b>PROJECT IN CURRENT BUSINESS PLAN</b>	Yes			
<b>SECTOR</b>	Refrigeration (Manufacturing)			
<b>SUBSECTOR</b>	All sub-sectors (excl. Servicing &MAC)			
<b>ODS USE IN SECTOR</b>	Baseline (Average of 1995-97)	2,770	MT ODP	
	Current (2001)	1,373	MT ODP (excl. Svvg & MAC)	
	From approved ongoing projects	809	MT ODP	
	From remaining non-eligible enterprises	29	MT ODP	
	From remaining eligible enterprises	535	MT ODP	
	Net remaining	564	MT ODP	
<b>PROJECT IMPACT</b>	Reflecting the net ODP value	535	MT ODP	
	Including approved ongoing projects	1,344	MT ODP	
<b>PROJECT DURATION</b>	4 years			
<b>PROJECT COSTS</b>		<u>UNDP portion</u>	<u>UNIDO portion</u>	<u>Total</u>
	Incremental Capital Costs	US\$ 2,714,050	612,000	3,326,050
	Contingencies	US\$ 221,936	61,200	283,136
	Incremental Operating Costs	US\$ 0	0	0
	Total Project Costs	US\$ 2,935,986	673,200	3,609,186
<b>REQUESTED GRANT</b>	US\$	<b>2,935,986</b>	<b>673,200</b>	<b>3,609,186</b>
<b>COST EFFECTIVENESS</b>	US\$/kg/y	6.86	6.28	6.74
<b>IMPLEMENTING AGENCY SUPPORT COSTS</b>	US\$	255,950	84,052	340,002
<b>TOTAL COST OF PROJECT TO MULTILATERAL FUND</b>	US\$	3,191,936	757,252	3,949,188
<b>LOCAL OWNERSHIP</b>	100%			
<b>EXPORT COMPONENT</b>	0%			
<b>STATUS OF COUNTERPART FUNDING</b>	N/A			
<b>PROJECT MONITORING MILESTONES</b>	Included			
<b>NATIONAL COORDINATING BODY</b>	Ministry of Environment & Forests			

**PROJECT SUMMARY**

This Phase-out Plan will eliminate all the remaining eligible CFC consumption in the Refrigeration (Manufacturing) Sector in India upon completion. The Phase-out Plan will be implemented through four annual implementation programmes and together with the implementation of the approved ongoing projects, will result in the complete phase-out of CFCs in the Refrigeration (Manufacturing) Sector in India in four years. The Phase-out Plan will cover technology conversions in the remaining eligible enterprises in the Refrigeration (Manufacturing) Sector, excluding the MAC sector, and ensure timely, sustainable and cost-effective phase-out through a combination of investment, technical support and policy/management support components. The refrigeration (Servicing) sector is being addressed through a separate phase-out plan being submitted to the 38<sup>th</sup> EC Meeting. The total eligible incremental costs and the requested grant for the Plan for phase-out of CFCs in the Refrigeration (Manufacturing) Sector in India are US\$ 3,609,186.

**IMPACT OF THE PROJECT ON THE COUNTRY'S MONTREAL PROTOCOL OBLIGATIONS**

The approval of this project will help India in meeting its Montreal Protocol obligations, such as the phased reductions in ODS consumption as per the agreed schedules.

<b>PREPARED BY</b>	UNDP (in consultation with MOEF and UNIDO)	<b>DATE</b>	July 2002
<b>REVIEWED BY</b>	Dr. Hubert Creyf (Foams), Dr. Lambert Kuijpers (Refrigeration)	<b>DATE</b>	August 2002

**PROJECT OF THE GOVERNMENT OF INDIA**  
**Plan for phase-out of CFCs in the Refrigeration (Manufacturing) Sector in India**

## **1. PROJECT OBJECTIVES**

The objectives of this project are:

- a) To achieve complete phase-out of CFCs in the Refrigeration (Manufacturing) Sector in India within four years.
- b) To enable India 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 in the Refrigeration (Manufacturing) Sector, through development and implementation of a combination of investment, technical support and policy/management support components.

## **2. INSTITUTIONAL FRAMEWORK**

India ratified the Vienna Convention in March 1991 and the Montreal Protocol in June 1992. In 1993, India prepared a detailed Country Programme to phase out ODS in accordance with its national industrial development strategy and in line with the Montreal Protocol control schedule. The Country Programme was aimed at ensuring that the phase out will be effected without undue economic burden to both consumers and industry and provided India with the opportunity to access the Montreal Protocol Financial Mechanism. The guiding principles of the Country Programme are, to minimize economic dislocation as a result of ODS phase-out, minimize industrial obsolescence, maximize indigenous production, promote one-step phase-out and to emphasize decentralized management.

The Government of India has entrusted the work relating to ozone layer protection and implementation of the Montreal Protocol, to the Ministry of Environment and Forests (MOEF), which is the coordinating Ministry in India for all matters concerning the Montreal Protocol. The MOEF has set up an Ozone Cell, as the national unit to manage and coordinate India's country programme for ODS phase-out.

The MOEF has established an empowered Steering Committee, which comprises of high-level representation from other line ministries and is primarily responsible for formulating and implementing policies and procedures pertaining to India's compliance with the Montreal Protocol. The Steering Committee is supported by three Standing Committees, namely the Technology and Finance Standing Committee (which reviews and endorses ODS phase-out proposals and activities), Standing Committee for Small Scale Industry (which is entrusted with advising on ODS phase-out and compliance by the crucial small industries sector) and Standing Committee for Monitoring and Evaluation (which advises and monitors implementation).

Recognizing the importance of establishing an effective policy framework for the successful implementation of the Country Programme, MOEF has initiated an aggressive action plan to create such a framework to reinforce the various ODS phase out measures:

### **2.1 Regulatory Measures**

- a) The Steering Committee, since its inception, has instituted an elaborate legal procedure for review and endorsement of project proposals, for submission to the Multilateral Fund for funding. Each enterprise seeking assistance is required to make a formal application to MOEF in a prescribed format along with legally binding documentation and certifications for establishing its eligibility, CFC consumption and financial viability. Each proposal is reviewed by the Technology and Finance Standing Committee for technical and policy issues and if acceptable, recommended for acceptance and formal endorsement.

- b) Trade in controlled substances with countries not party to the Montreal Protocol has been prohibited.
- c) Export of Annex A and Annex B substances to Non-Article 5 Parties has been prohibited.
- d) The import and export of all Annex A and Annex B substances are subject to licensing.

## 2.2 Fiscal Measures

- a) Full exemption from payment of Customs and Excise tariffs on capital goods required to implement ODS phase out projects funded by the Multilateral Fund. The exemption from Customs and Excise tariffs has been extended to ODS phase-out projects, which were eligible for funding under the Multilateral Fund, whether or not such enterprises actually sought assistance from the fund. This will also cover projects submitted for retroactive financing. The benefit was available subject to the condition that enterprises should give a clear legal commitment to stop using ODS in all future manufacturing operations after the projects were implemented.
- b) The duty exemptions were also extended to items of recurring use, including non-ODS alternatives for a duration for which, incremental operating costs were committed by the Multilateral Fund in approved projects.
- c) The duty exemptions were also extended to capital goods required for establishing new capacity with non-ODS technology.
- d) Indian financial institutions have been advised not to finance/refinance new ODS producing/consuming enterprises.
- e) The Tariff Advisory Committee (a statutory body under the Insurance Act, 1938) has decided to grant suitable discounts on fire insurance premiums if alternative agents are used to replace halons.

## 2.3 Legislation

In exercise of the powers conferred under sections 6, 8 and 29 of the Environment Protection Act of 1986, Government of India formulated the draft Ozone legislation called the Ozone Depleting Substances Rules, which were published in the Gazette of India in 1998 for public comments and also circulated in the industry for advance intimation and comments. These have since been officially notified and have formally come in to effect from January 2000. The provisions of this comprehensive legislation are summarized as below:

### *ODS Production*

- Mandatory registration with MOEF
- Restriction on production levels as per "base level" and specified time-bound reductions.
- Prohibition on creating new capacity or expansion of capacity
- Export restricted to countries who are signatory to the Montreal Protocol

### *ODS Consumption*

- Ban on new capacity or expansion of capacity for production of ODS based equipment.
- Mandatory registration with designated authorities
- Declaration requirement in prescribed format, to the seller, at the time of procurement of ODS

### *ODS Trade*

- Mandatory registration for Exporters & Importers with designated authorities

- No sales without license to persons/organizations which have not intimated the Government of India about use of ODS based equipment (including compressors).

#### *General*

- Mandatory registration for reclamation and destruction of ODS. All registrations will be valid for specified periods, after which, they are required to be renewed.
- Every person who produces, uses, imports, sells, stocks, reclaims or destroys ODS has to maintain records and file reports as specified.
- Every entity, which has received technical and/or financial assistance from any international agency or financial assistance from Government of India including duty exemptions, is required to maintain records and file reports as specified.

### **3. SECTOR BACKGROUND**

#### **3.1 Background of the Refrigeration Sector**

The range of products manufactured in the sector includes, household refrigerating appliances such as domestic refrigerators and freezers, commercial refrigeration equipment such as display cabinets, bottle coolers, chest freezers, hot and cold water dispensers, visi-coolers, ice-candy machines, water coolers, reach-in refrigerators, walk-in coolers and freezers, industrial refrigeration equipment such as cold storage, process chilling and transport refrigeration units, and commercial air conditioning applications such as central air conditioning systems and mobile air conditioning units. The sector has experienced substantial growth in the past decade, due to the trade liberalization and tariff reduction policies, increased rural electrification, increased emphasis on agriculture-based food processing industries, consistent growth in the per capita income, indigenous availability of chemicals, all round growth and diversification in the various industrial sectors and applications, particularly in sectors such as automotive, transportation, construction, etc., growing predominance of the service industry, the relatively low market penetration of domestic, commercial and industrial appliances and expansion due to the replacement market. The sector, with the exception of domestic refrigerators and to some extent central air conditioning plants, comprises of a large number of small/medium sized enterprises and tiny/unorganized enterprises, which could pose a challenge to be reached, educated and addressed in respect of the ODS phase-out. CFCs are consumed as blowing agents (CFC-11) and refrigerants (CFC-12, R-502, etc) in the manufacture of refrigeration and air-conditioning products.

India will need to make tremendous efforts to comply with the next control step of the Montreal Protocol, i.e. 50% reduction by 2004/2005. The Indian industry will also need to comply with the new legislations. The sector phase-out approach would contribute to such compliance in a timely and cost-effective manner.

#### **3.2 Structure of the Refrigeration Sector**

There exist capacities in India for manufacturing the chemicals and components required by the Refrigeration (Manufacturing) Sector.

##### 3.2.1 Supply Industry

##### *Compressors*

There are a few manufacturers, both indigenous and multinational, of hermetic and semi-hermetic refrigeration compressors in India; the domestic demand of compressors is met through these manufacturers and complemented with imports from North America, Europe, Japan and Southeast Asia. Three indigenous manufacturers have been assisted by MLF for conversions and for facilitating CFC phase-out in the downstream users.

## ***Chemicals***

Refrigerants and blowing agents required in manufacturing refrigeration appliances, equipment and systems, are manufactured in India and the domestic requirements are met mainly through indigenous sources. The other refrigeration system components are partly produced indigenously and partly imported.

## ***Equipment and tooling***

There are a few indigenous manufacturers in India, of the processing equipment and tooling required for this sector. These manufacturers are engaged in fabricating and assembling low-pressure polyurethane foam dispensers, refrigerant charging and evacuation equipment and other tooling. Most of the major multinational equipment manufacturers are represented in India, however, given the size and geography of the country, the level of technical support and after-sales service available from them is quite inadequate. The presence of indigenous manufacturers is directly related to the relatively high investment costs of imported equipment, to the unsatisfactory quality and level of support available and to the high cost of spare parts and consumables.

On the whole, 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.

### **3.2.2 User Industry**

In the domestic refrigeration sub-sector, there are a few large manufacturers of household refrigerators and freezers, who either have license or joint venture agreements multinational corporations or have wholly owned subsidiaries. There are also a few indigenous manufacturers of domestic refrigeration equipment. Seven manufacturers have been assisted under the MLF.

The commercial refrigeration sub-sector comprises of a large number of predominantly small and medium-sized enterprises, which are geographically scattered and with relatively little access to sophisticated technology and practices. These enterprises are typically characterized by very low levels of investments in plant and machinery and resulting labor-intensive operation. Many enterprises opt for locally assembled and/or custom-built foam dispensers, typically single-ratio and low-pressure type, to minimize investments. Many also engage in hand-mixing/pouring operations. The refrigerant charging and evacuation operations are predominantly carried out by semi-automatic equipment or by manual kits.

The transport refrigeration sub-sector comprises of manufacturers of refrigerated bodies for trucks and trailers and refrigerated containers. As a critical element in the cold chain, this sub-sector serves an important function.

Although general awareness about quality assurance, training, environment and safety-related issues exists, it does not receive much emphasis in practice, due to low levels of operating capital, because of the low scale of operation and the pressures on profitability exerted by the very competitive domestic market as well as relatively cheap imports. In general, the knowledge of the latest chemicals and technologies is limited in these enterprises.

There is a significant existing population of domestic and commercial refrigeration appliances and equipment and also of mobile air conditioning units. Due to the rapid economic growth in the past two decades, there is a significant number of office buildings and complexes served by central air conditioning centrifugal chillers, which require servicing. As a result, there is a large and fast growing servicing sector comprising of a large number of servicing establishments.

### 3.3 History of ODS Phase-out

The baseline ODS consumption for all sectors in India, as reported by the Government of India is as tabulated below:

**Table-1**  
India: Baseline ODS Consumption (1995-97)

SECTOR	1995 (MT)	1996 (MT)	1997 (MT)	Average (ODS MT)	Average (ODP MT)
Aerosols	1,626	1,788	983	1,466	1,466
Foams	6,203	6,384	6,812	6,466	6,466
Refrigeration	2,521	2,818	2,973	2,770	2,770
Solvents	154	26	12	64	53
Halons	295	234	221	250	1,245
<b>TOTAL</b>	<b>10,799</b>	<b>11,250</b>	<b>11,001</b>	<b>11,016</b>	<b>12,000</b>

The Refrigeration and Air Conditioning Sector in India accounts for about 25% of India's baseline CFC consumption. Since 1994, until December 2001, a total of 40 investment projects in the Refrigeration (manufacturing) Sector have been funded under the Montreal Protocol mechanism, implemented by UNDP, UNIDO or the World Bank. The detailed list of investment projects approved in this sector until end-2001 is attached in Annex-1. The summary of approved investment projects is as below:

**Table-2**  
India Refrigeration Sector - Historical investment project approvals as of December 2001

Refrigeration Sub-Sector	Category of enterprises	Number of approved Projects	CFC Phase-out Target (ODP MT)	Approved Funding (US\$)	Overall CE (US\$/kg)
Domestic	Large	7	1,742	11,209,134	6.44
Commercial/other	Medium or small	33	602	7,318,068	12.16

The seven enterprises in the domestic refrigeration are large manufacturers and constitute the entire indigenous domestic refrigeration sub-sector in India. The 33 approvals in the commercial refrigeration sub-sector (and other sub-sectors) covered a total of 60 enterprises. All of the enterprises in the commercial refrigeration (and other sub-sectors) were predominantly small and medium-sized, most of them with a CFC consumption of less than 20 MT/y. Only 2 out of the 60 enterprises had a baseline CFC consumption of more than 20 MT/y. Of the total 60 enterprise covered, 44 enterprises had a baseline CFC consumption of less than 10 MT/y. The distribution of the approved investment projects based on enterprise size is tabulated below:

**Table-3**  
India - Commercial Refrigeration (and other) Sub-sectors  
Distribution of investment project approvals as of December 2001 by enterprise size

Baseline CFC Consumption range (MT/y)	Number of enterprises	Distribution (% of total CFC consumption)
0 to 5	37	33.2
5 to 10	8	12.3
10 to 20	13	47.1
Above 20	2	7.4
Total	60	100.0

Thus, 45 out of 60 (75%) of the enterprises covered, had a CFC consumption of less than 10 MT/y. This is consistent with the observations in section 3.2.2), particularly with those related to the modest levels of investments, training, technical assistance, knowledge base and awareness available to these enterprises.

The Montreal Protocol programme in India has addressed primarily the domestic refrigeration sub-sector and to some extent the commercial refrigeration sub-sector. In addition to achieving the ODS phase-out targets, it has created a degree of awareness among the industry, of the need for incorporating environmental objectives in their investment and operational decisions. The technical assistance and training inputs received through the projects have also enhanced to some extent, the capacity at the enterprise level to address technical and environmental issues. However, the source of the remaining consumption in the Refrigeration (Manufacturing) sub-sector is from predominantly small and medium-sized enterprises characterized as described in the user industry structure (section 3.2.2) by modest levels of investments, training, technical assistance, knowledge base and awareness available to these enterprises. Moreover, since the enterprises are scattered and difficult to access, the progress of the programme in this sector on the whole, has been modest.

### 3.3.1 Historical Phase-out Approach

Of the total of 60 enterprises covered by the investment project approvals in the commercial refrigeration sub-sector (and other sub-sectors), 40 enterprises were part of five group projects. All enterprises covered were essentially small or medium-sized with individual baseline CFC consumption levels less than 10 MT/y. most of them with less than 5 MT/y. This represents 66% of the total number of enterprises, 45.5% of the total funded baseline CFC consumption in the sub-sector and about 51.2% of the total approved funding. Thus, the group approach seems to be effective in terms of coverage and CFC phase-out, though it has not necessarily been fully effective in mitigating the infrastructural barriers, such as technology awareness, technical assistance, training, etc. due to the relatively limited amounts of resources approved for these activities, which are considered crucial in sustaining the viability of the enterprises and the CFC phase-out. A sector-wide phase-out approach therefore needs to be selected to address the remaining CFC consumption in this sector, addressing these concerns and considering that:

- That the Refrigeration (Manufacturing) Sector has made relatively modest progress in CFC phase-out
- Only the phase-out of CFCs in new products in all remaining manufacturing enterprises in this sector will primarily limit CFC use in this sector and provide the Government with the control and confidence needed to assure India's compliance with the Montreal Protocol control milestones and assist the enterprises in compliance with the present and forthcoming legislations.

### 3.3.2 Historical Technology Choices

Five of the seven approved projects in the domestic refrigeration sub-sector selected cyclo-pentane technology for conversion of their foam operations. All remaining approved projects selected HCFC-141b based systems. The choices have been guided primarily by the scale of operations and costs. For the refrigerant operations, enterprises of all (except one) approved projects in the sector have chosen HFC-based technology, being the only cost-effective and viable technology available.

### 3.3.4 Future CFC phase-out Action Plan

The Government of India plans to address the remaining CFC consumption in the Refrigeration and Air Conditioning Sector through submission of a sector-wide phase-out plans beginning 2002 as below:

- Sector Phase-out Plan for Refrigeration Manufacturing (November 2002)
- Sector Phase-out Plan for Refrigeration Servicing (November 2002)

### 3.4 Survey of the Refrigeration (Manufacturing) Sector

The approved non-investment project, Strategy and Action Plan for ODS Phase-out in the Foam Sector in India, was approved in July 1994. At this time, the implementation of the Montreal Protocol programme in India had just commenced. The objectives and scope of work envisaged under this project were:

- To collect information on the sector (leading to identification of users, categorization of the users, technology selection, etc.)
- To prepare an ODS phase-out strategy (covering awareness creation and information dissemination, capacity building, etc.)
- To prepare and implement an action plan for ODS phase-out (addressing management, timeframe and estimated costs of phase-out, SMEs and informal sectors, etc.)

The project was initially envisaged to be executed nationally, through the Department of Chemicals, Ministry of Petrochemicals, Government of India. However, until 1997, not much progress was made. The approved project document was not signed until this point. In the intervening period (from July 1994 until 1997) substantial progress was made in the Foam and Refrigeration (Manufacturing) Sectors through preparation, approval and implementation of several projects through the World Bank and UNDP. Thus, the original scope of this project, which presumed that a strategy would be in place before implementation of ODS phase-out activities, needed to be modified to reflect the changed scenario. The Government of India requested UNDP to propose a revised scope of activities for the project, which would enable identification of residual ODS users through direct contact, workshops and publicity, which would lead to formulation of investment projects covering the foam and refrigeration sectors and enable development of the appropriate action plan for ODS phase-out. UNDP developed the revised scope of the activities under this project in collaboration with Government of India, as below:

- Identification all upstream suppliers to the Foam Sector.
- Interaction with and information dissemination to the residual ODS users in the Foam and Refrigeration (Manufacturing) Sectors through newspaper announcements and workshops.
- Identification of all residual ODS users in the Foam and Refrigeration (Manufacturing) Sectors

UNDP/UNOPS in collaboration with MOEF, arranged for newspaper announcements for facilitating information dissemination and to locate residual ODS users in June 1998. The first identification and technical assistance workshop for residual ODS users in January 1999 which resulted in successful identification of a large section of residual ODS users in the Foam and Refrigeration (Manufacturing) sectors, fruitful interaction with them and led to the preparation of several projects. UNDP/UNOPS continued the identification work of ODS users and for maintaining sustainability and ensuring local capacity development, retained the services of a local consulting firm in agreement with MOEF. Through the UNDP international and local experts, the work of surveying and identifying remaining CFC users continued and resulted in a steady submission and approval of investment projects. The second identification and technical assistance workshop for residual ODS users, preceded by field contacts and publicity, was held during November 2000. The workshop resulted in further identification of CFC users in the Foam and Refrigeration (Manufacturing) sectors.

The surveying work of the Foam and Refrigeration (Manufacturing) sectors continued with enterprise contacts and plant visits, based on the information and knowledge base generated through the workshops and through the responses to the various publicity actions, carried out under this project. During the first half of 2002, additional assistance for the survey was provided by AIACRA (All India Air Conditioning & Refrigeration Association) and its affiliated and subsidiary associations and chapters.

The survey and identification work of residual CFC users in the foam sector was completed in April 2002 and for refrigeration (manufacturing) sector was largely completed in June 2002. Most residual CFC users are now identified and their baseline information obtained.