UNITED NATIONS DEVELOPMENT PROGRAMME
Project of the Government of India
PROJECT DOCUMENT

Project Number:	**IND/REF/42/INV/371/A/AS/34 – 41376**
Project Title:	**National CFC Consumption Phase Out Plan (NCCOPP) focusing on the Refrigeration Servicing Sector – UNDP Component**
Duration:	**6 years**
Source of Funds	**AS – Implementation of the Montreal Protocol Sector Plans**
Executing Agency:	**UNDP (Direct Execution)**
Estimated Starting Date:	**15 September 2004**
UNDP Inputs:	**US$ 277,200 (first of six funding tranches of a $1,522,260 programme)**

Brief Description: This project is one component of the National CFC Consumption Phase-Out Plan (NCCOPP) approved at the 42nd Meeting of the Executive Committee of the Multilateral Fund. While the lead agency for NCCOPP is GTZ, UNDP implements the aerosols, foam and the commercial refrigeration manufacturing sectors (except for the refrigeration transportation sector which is implemented by UNIDO). Remaining CFC consumption that is covered under NCCOPP corresponds to the refrigeration servicing sector, and this project document is only related to this latter part. Furthermore, several implementing agencies participate in the refrigeration servicing sector (Germany, Switzerland, UNEP and UNDP). The role of each agency is spelled out in the attached formal agreement between the Government of India and the Executive Committee and further refined in a Memorandum of Understanding (attached) between the various agencies established in New Delhi in May 2004. UNDP's role for the servicing sector is to act as a facilitator in the procurement and distribution of equipment kits to Refrigeration Servicing Enterprises (RSEs) that undertook training in one of the project's Training Cells (TCs), as well as training equipment kits for the TCs (not during this first phase) and India's Industrial Training Institutes (ITIs), including consolidating the list of RSEs who would receive the equipment kits, with the exception of 2004 and 2005 which will be carried out by GTZ. The work related to the identification of the TC/RSEs for training activities will not be carried out by UNDP.

Legal Context: This project document shall be the instrument referred to in the Standard Annex to project document as shown in Annex 5 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 under DEX and in accordance with the Agreement between the Executing Committee of the Multilateral Fund for the implementation of the Montreal Protocol and UNDP signed on 21 August 1991, and the 2004 Annual Implementation Programme approved by the Executive Committee at its Forty-second Meeting (29 March – 2 April 2004) held in Montreal, Canada, 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 the Government of India (Document UNEP/OzL.Pro/ExCom/42/54 Annex XIII).

The annual funding tranches beginning 2005, 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.

On behalf of the	Signature	Name and Title	Date
UNDP		Resident Representative	17/11/04
Government (DEA)		P.K. Deb, Jt. Secy.	5.11.04
MOEF		Usha Chandrasekhar Director, Ozone Cell Ministry of Environment & Forests Government of India New Delhi	17.9.04

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

PROJECT COVER SHEET

COUNTRY	INDIA	IMPLEMENTING AGENCY	UNDP
PROJECT TITLE	**National CFC Consumption Phase-Out Plan (NCCOPP) focusing on the Refrigeration Servicing Sector (UNDP Portion only -- Phase 1)**		
IMPLEMENTATION MODALITY		DEX (Direct Execution)	
SUBSECTOR		Refrigeration Servicing Sector	
ODS USE IN SECTOR		See Overall Sector Plan	
PROJECT IMPACT (Total programme)		See Overall Sector Plan	
PROJECT DURATION (Total programme)		6 Years (2004 – 2009)	
PROJECT DURATION (1st and Present Phase)		1 year	
PROJECT COSTS (all Agencies for all 6 Years)		US$ 6,338,120	(indicative only)
PROJECT COSTS (UNDP portion for all 6 Years)		US$ 1,522,260	(indicative only)
IMPLEMENTING AGENCY SUPPORT COSTS (UNDP portion for all 6 years)		US$ 114,171	(indicative only)
PROJECT COSTS (UNDP portion, 1st Phase)		US$ 277,200	
COST EFFECTIVENESS		NA	
IMPLEMENTING AGENCY SUPPORT COSTS (Phase 1)		US$ 20,790	
TOTAL COST OF UNDP's 1st PHASE TO MLF		US$ 297,990	
COUNTERPART FUNDING		**All refrigeration servicing enterprises will contribute 40% of value of the equipment kit. For the 1st phase these contributions are expected to add up to US$ 19,320 for 105 kits which comes in addition to the US$ 277,200 MLF grant.**	
PROJECT MONITORING MILESTONES		Included	
NATIONAL COORDINATING BODY		Ministry of Environment & Forests (MOEF)	

PROJECT SUMMARY

This project is one component of the National CFC Consumption Phase-Out Plan (NCCOPP) which was approved at the 42nd Meeting of the Executive Committee of the Multilateral Fund. While the lead agency for NCCOPP is GTZ, UNDP implements the aerosols, foam and the commercial refrigeration manufacturing sectors (except for the refrigeration transportation sector which is implemented by UNIDO). Remaining CFC consumption that is covered under NCCOPP corresponds to the refrigeration servicing sector, and this project document is only related to this latter part. Furthermore, several implementing agencies participate in the refrigeration servicing sector (Germany's GTZ, Switzerland's INFRAS, UNEP and UNDP). The role of each agency is spelled out in the attached formal agreement between India and the Executive Committee and further refined in a Memorandum of Understanding (MOU attached) between the various agencies established in New Delhi in May 2004. UNDP's role for the servicing sector is to act as a facilitator in the procurement and distribution of equipment kits to Refrigeration Servicing Enterprises (RSEs) that undertook training in one of the project's Training Cells (TCs), as well as training equipment kits for the TCs (not during this first phase) and India's Industrial Training Institutes (ITIs) including consolidating the list of RSEs who would receive the equipment kits, with the exception of 2004 and 2005 which will be carried out by GTZ. The work related to the identification of the TC/RSEs for training activities will not be carried out by UNDP.

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 CFC consumption as per the agreed schedules.

PREPARED BY Jacques Van Engel, UNDP-MPU **DATE** May 2004

PROJECT OF THE GOVERNMENT OF INDIA
NATIONAL CFC CONSUMPTION PHASE-OUT PLAN (NCCOPP)
FOCUSING ON THE REFRIGERATION SERVICING SECTOR

(UNDP PORTION ONLY -- PHASE 1)

Note: As many agencies are involved, the document uses quite a number of acronyms. A list of those is thus provided in the end of this document.

1. PROJECT OBJECTIVES

This project is one component of the National CFC Consumption Phase-Out Plan (NCCOPP) which was approved at the 42nd Meeting of the Executive Committee of the Multilateral Fund. While the lead agency for NCCOPP is GTZ, UNDP implements the aerosols, foam, and the commercial refrigeration manufacturing sectors (except for the refrigeration transportation sector which is implemented by UNIDO). Remaining CFC consumption that is covered under NCCOPP corresponds to the refrigeration servicing sector, and this project document is only related to this latter part. Furthermore, several implementing agencies participate in the refrigeration servicing sector (Germany's GTZ, Switzerland's INFRAS. UNEP and UNDP). The role of each agency is spelled out in the attached formal agreement between India and the Executive Committee and further refined in a Memorandum of Understanding between the various agencies established in New Delhi in May 2004 (MOU attached). UNDP's role for the servicing sector is to act as a facilitator in the procurement and distribution of equipment kits to:

- the Refrigeration Servicing Enterprises (RSEs)
- the Training Cells (TCs) (will not be needed during this first phase of the project)
- India's Vocational Centers (Industrial Training Institutes – ITIs)

The work related to the identification of the TCs. conducting the training activities will not be carried out by UNDP. However, the consolidation of the list of RSEs who should receive an equipment kit will be undertaken by GTZ for 2004 and 2005, UNDP will take over this role starting 2006.

Another five funding phases will be approved in subsequent years and will result – in cooperation with the efforts of all stakeholders and Implementing Agencies -- in achieving the overall CFC phase out in the refrigeration servicing sector.

Important note related to the flexibility clause. The MOU (Annex 1) stipulates that agencies may be asked to fund activities at the borderline of their pre-defined tasks, e.g. UNDP might be required to fund training. While this is unlikely to happen during the first phase of the project, this enlargement / shifting of scope may be requested any time, with the concurrence of the Core Group, and would then result in a comprehensive budget revision.

2. INSTITUTIONAL FRAMEWORK

(See project document approved at the 42nd ExCom Meeting including all agencies and all phases, Annex 2)

3. SECTOR BACKGROUND

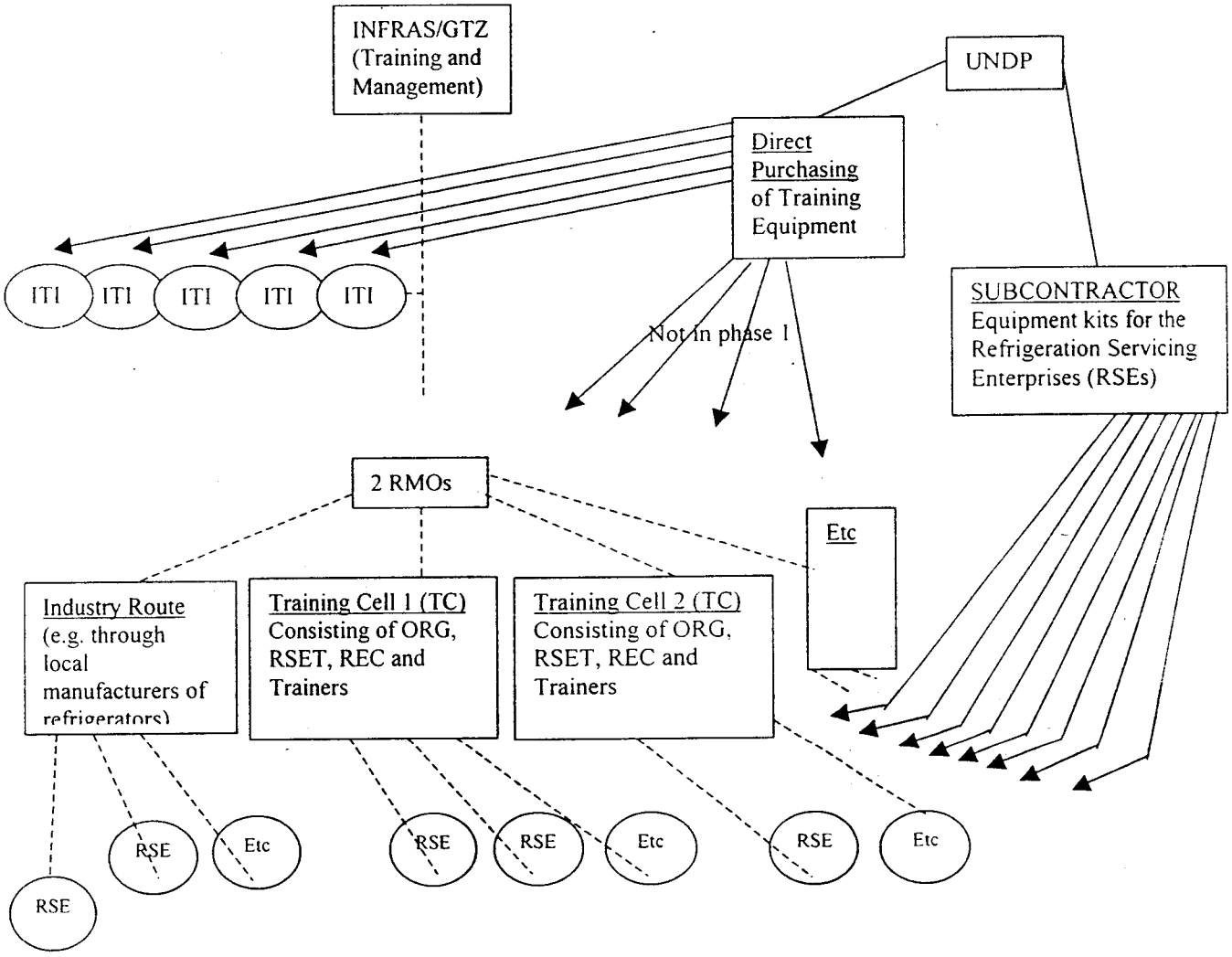
(See project document approved at the 42nd ExCom Meeting including all agencies and all phases)

4. PROJECT DESCRIPTION

The "Agreement between India and Executive Committee for Multilateral Fund for the National Phase-out of CFC Consumption in India focusing on the Refrigeration Servicing Sector" (Annex 3) envisages complete phase-out of CFC consumption in India by 1 January 2010 in compliance with Montreal Protocol schedules. The

Government of India has the overall responsibility for management and implementation of the Agreement. The Government of Germany has been designated as the Lead Implementing Agency. The Government of Switzerland, UNDP, UNEP and UNIDO have been designated as Cooperating Implementing Agencies, under the lead of the Government of Germany. The key activities to be taken up under this project are training of service technicians, equipment support to select RAC servicing firms, and awareness generation.

The training activities will be by and large organized on the pattern of training under the previous "HIDECOR" project, supported by the Government of Switzerland. The HIDECOR has trained 8,000 Refrigeration Servicing Enterprises (RSEs) in a geo-focus of 6 South-Western states. The key common features with the HIDECOR model are as follows:



(a) INFRAS will subcontract two Regional Management Organizations (RMOs). One of them in the North East will identify 6 new Training Cells (TCs) and oversee the activities thereof, which are described below.

(b) Training will be conducted through industry route as well as through specifically identified and established training cells (TCs). The exact number of persons to be trained in 2004/2005 through each route and their State-wise distribution will be determined and finalized by early June 2004. The overall training target 2004/2005 is 1500.

(c) Typically, each Training Cell (TC) will comprise of:

- An Organiser (ORG)
- A Refrigeration Servicing Enterprises Training Institute (RSET)
- A Recruiter (REC)
- A set of Trainers.

Each of these entities has a distinct role, similar to those used in the framework of the previous HIDECOR project. The training would be provided to the Refrigeration Servicing Enterprises (RSEs).

(d) The trainers belonging to the identified RSET and other external trainers will be trained through a Training of Technician (TOT) programme. Further, the first two programmes conducted by a training cell will be hand-held with the help of independently nominated Refrigeration / AC experts. Any of the training programmes may be monitored at the discretion of the RMO.

(e) The training material to be used will be similar to that developed for HIDECOR with a few adaptations to the specific needs of NCCOPP. The translated versions (developed under HIDECOR or newly translated) may also be used by the training cells, if appropriate in their region.

(f) Not more than two persons per Refrigeration Servicing Enterprise (RSE) will be considered for training.

(g) A first period of the programme running from June to September 2004 will consist of the identification by the RMO appointed by INFRAS of the TCs including their respective ORG, REC, RSET and set of trainers in 6 North-Eastern states. During a second period running from mid October to November 2004 will consist of organizing the Training of the Trainers (TOT) and the preparation of the first-hand held training with the Training Cells (TCs). During a last period forming part of this first phase of the project and running from December 2004 through March 2005, 1 to 2 additional hand-held training and 2 regular training sessions will have been held by each of the newly established TCs under supervision of the RMO. (In 4 TCs that have already been established in the North-East, regular training programmes may commence earlier).

(h) As indicated in paragraph 1 and as shown in the above diagram, UNDP's role is to act as a facilitator in the procurement and distribution of training equipment for the Vocational Schools (ITIs) and in future phases of the project to TCs as well. In addition, equipment kits will be provided to Refrigeration Servicing Enterprises (RSEs) which were either trained in one of the project's TCs or in a programme delivered through an established "industry route" (e.g. part of a servicing network of a large refrigeration manufacturing enterprise).

5. DETAILED IMPLEMENTATION ARRANGEMENTS

During a steering meeting held in May 2004 in New Delhi, clear preference was given and endorsed by Ozone Cell, Ministry of Environment and Forests, to use the Direct Execution modality (DEX). UNDP India Country Office has received approval from its Regional Bureau for Asia and the Pacific (RBAP) to undertake the DEX modality.

(a) Related to the training related equipment, INFRAS through GTZ will communicate to UNDP how many sets of equipment will be needed and what each kit should contain (based on their experience with HIDECOR experience with adjustments). UNDP would then undertake the bidding exercise and purchase the equipment via UNDP India Country Office. During the first phase, the equipment would be for the ITIs. In subsequent phases the equipment would also be for the TCs through an RMO (or industry-route). In those cases, UNDP's procurement will include the local transportation cost of shipment to TCs through their respective RMOs. In all cases, UNDP's procurement will include the cost of transportation up to the final recipient of the equipment. The amount for this procurement is estimated at US$ 153,000.

(b) The other major component for UNDP will consist of the equipment kits which are meant to be distributed to about 105 Refrigeration Servicing Enterprises (RSEs) throughout the country (1st phase). In subsequent phases, it is anticipated that the same or higher number of kits will have to be purchased and distributed. This will be a labour-intensive task because 40% of the cost of the equipment kit must be borne by the RSEs themselves. While UNDP will undertake the procurement function, the mechanism being proposed for the collection of the 40% counterpart funding and the distribution of the equipment kits will therefore be handled by a subcontractor (Principal Distributor) in the following fashion:

- UNDP would purchase the equipment kits directly but the distribution will be undertaken by a "Principal Distributor (PD)" under a subcontract.
- The PD would be selected through a competitive bidding process. All bidders must demonstrate that they have an extensive distribution network in India and some basic technical knowledge in refrigeration in order to qualify.
- UNDP would be requested to purchase a certain amount of equipment kits of various types (e.g. basic, medium, elaborate). A Concept Note on Equipment Support Scheme (ESS) for the Refrigeration Service Enterprises has been developed by GTZ/INFRAS as a framework for the equipment support scheme. Equipment specifications of the three types of kits and the Terms of Reference of the PD will be further elaborated under the Concept Note.
- The estimated price of the various kits reflected in the Concept Note, based on HIDECOR's past experience in the sector, will serve as a reference in budgeting. The actual equipment costs will be determined by the competitive bidding process.
- No customs duties, excise tax would apply on this type of equipment imported by UNDP. For locally made equipment, the PD would obtain applicable regulations on duties in this regard with MOEF's assistance.
- Customs clearance and inland transportation to a warehouse facility will be undertaken by UNDP.
- The PD contracted by UNDP will be responsible for the collection of the 40% counterpart funding from participating RSEs. Upon receipt of the counterpart funding and confirmation of deposit into an Escrow Account, UNDP will authorize release of the equipment kits to the PD for distribution.
- PD will be responsible for inland transportation, insurance, handling charges etc. for delivery of the equipment kits from the central warehouse facility to the sites of the RSEs.
- For the services performed by the PD, the PD will be compensated for a fee for the collection of counterpart funding and for each equipment kit delivered to the RSEs.
- All major equipment within the equipment kit that will be distributed must have a special sticker (to be provided by GTZ) with serial number to allow for monitoring of its use.
- All equipment kits will include an information brochure and/or a poster (to be provided by GTZ).
- Starting 2006, based on the Concept Note, guidance from MOEF, interaction with the industry network as appropriate, awareness workshops by UNEP, UNDP will establish a consolidated list of enterprises willing to participate in the procurement scheme. GTZ will undertake this function for 2004 and 2005.
- Refrigeration Servicing Enterprises (RSEs) would apply for the purchase of a kit if they can produce a certain number of documents such as:
    - Beneficiary is a firm with proof of its existence
    - Statement that the Refrigeration Servicing Enterprise (RSE) did not already receive a kit before
    - Must consume a certain amount of CFC's per year (tentatively set at 50 kg/RSE)
    - Pre-payment (by check or other means) covering 40 % of package cost of equipment kit (cost of equipment, customs clearance, insurance, inland transportation, handling fee of PD etc.)

- The budget for the subcontract is as follows:

Line-Item	TOTAL	2004	2005
Up to 105 kits @ US$ 687* for average kit	72,135	36,135	36,000
Spares (6%)	6,804	3,400	3,404
Customs clearance, warehousing, local transport and insurance (10%)	11,781	6,000	5,781
Delivery, handling and administrative costs (20%)	22,680	11,340	11,340
Total before 40% counterpart funding	113,400.00	56,875	56,525
Deductions (part of 40% counterpart funding)	(19,320.00)		(19,320.00)
	94,080	**56,875**	**37,205**

*** Average cost provided by GTZ/INFRAS**

6. FUNDING

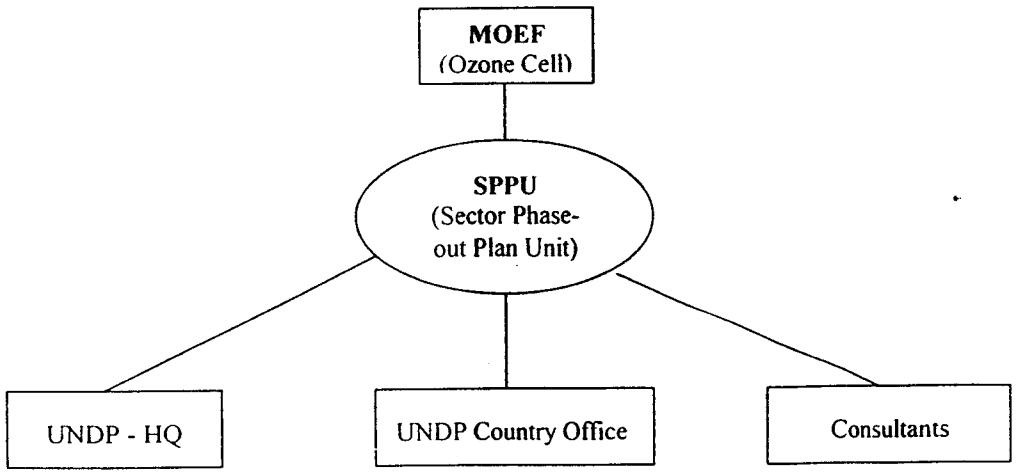
Line-Item	TOTAL	2004	2005
Consultancies	5,000	5,000	
Travel for Steering Committees	5,000	5,000	
Subcontract related to Equipment kits	94,080	56,875	37,205
Equipment for Training Cells (see footnote)	0	0	0
Training Equipment for ITIs (75% of 60 units)	153,000	100,000	53,000
Contingencies & Sundries	20,120	10,000	10,120
TOTAL	**277,200**	**176,875**	**100,325**

Footnote: Not envisaged during this first phase of the programme

7. IMPLEMENTATION MODALITY

The current section applies to the UNDP-portion of the NCCOPP only.

As already mentioned, the programme will be implemented using the Direct Execution modality (DEX). As such, the programme will be implemented using the following structure. It should be noted that a Sector Phase-out Plan Unit (SPPU) is already established and staffed with funding from the ongoing foam and refrigeration manufacturing sector programmes.



The attached Operational Mechanism for Implementation (OMI) (Annex 4) developed under IND/02/G66 – Foam Sector Phase-out Plan and IND/03/G62 – Refrigeration (Manufacturing) Sector Phase-out Plan, that has been successfully applied to facilitate implementation of these two sector plans, will serve as a framework for implementation of UNDP activities under this project, to the extent relevant and applicable, generally in line with the role and responsibilities of various actors as described in the OMI.

Subject to availability of funding and agreement by MOEF and other agencies, future phases of this project may envisage limited financial support to SPPU.

8. REPORTING AND OBTAINING FUNDING FOR FOLLOWING PHASES.

A yearly progress report must be prepared by GTZ, showing the progress made in the project activities and reporting on the CFC-phase-out amounts that have been achieved. UNDP will provide inputs to these reporting requirements.

9. ANNEXES

Annex 1 Memorandum of Understanding
Annex 2 Project proposal: National CFC Consumption Phase-out Plan
Annex 3 Agreement between India and the Executive Committee of the Multilateral Fund for the National Phase-out of CFC Consumption in India focusing on the Refrigeration Service Sector
Annex 4 Operational Mechanism for Implementation
Annex 5 SBAA

Glossary of Acronyms used in the document:

CFC	Chloro Fluoro Carbons
GTZ	German Technical Cooperation Agency
ExCom	Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol
DEX	UNDP Direct Execution modality
INFRAS	Swiss Technical Cooperation Agency
ITI	Industrial Training Institute
HIDECOR	Swiss funded servicing sector programme preceding NCCOPP
MOEF	Ministry of Environment and Forests
MOU	Memorandum of Understanding
NCCOPP	National CFC Consumption Phase-Out Plan
ORG	Organizer of a TC
RAC	Refrigeration and Air Conditioning
RBAP	UNDP's Regional Bureau of Asia and the Pacific
REC	Recruiter of a TC
RMO	Regional Management Organization
RSE	Refrigeration Servicing Enterprise
RSET	Refrigeration Servicing Enterprise Training Institute of a TC
SPPU	UNDP-related Sector Plan Phase-out Unit in New Delhi
TC	Training Cell
TOT	Training of the Trainers
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization

Annex 1

India National CFC Consumption Phase-out Plan

MoU for Agency Cooperation and Organisation of Work for the National CFC Consumption Phase-Out Plan focussing on the Refrigeration Service Sector (NCCOPP)

Preamble.

On behalf of the Ozone Cell within the Ministry of Environment and Forests, Government of India, several bilateral donors and implementing agencies were charged with the preparation and subsequent negotiation of a National CFC Consumption Phase-out Plan focussing on the refrigeration service sector (NCCoPP). These donors and bilateral agencies are GTZ on behalf of the bilateral donor Germany, charged for this project with the function of a lead agency, and the cooperating agencies UNDP, UNEP and UNIDO as well as Infras, the latter on behalf of the bilateral donor Switzerland. On April 2nd the project and an associated funding level of 6,338,120 USD for the project components "Refrigeration and Air Conditioning Service Sector Plan" (GTZ, Infras, UNDP, UNEP) and "Customs and Policy Strategy" (UNEP) was approved by the 42nd Meeting of the Executive Committee of the Multilateral Fund on the basis of an agreement between the MLF and the Government of India. This agreement integrates the existing projects "Sectoral phase-out plan for elimination of CFCs in the foam sector (approved at 37th Meeting of the Executive Committee; UNDP)" and "Plan for phase-out of CFCs in the refrigeration (manufacturing) sector (approved at 38th Meeting of the Executive Committee; UNDP, UNIDO)" into NCCoPP.

In consultation with Ozone Cell this MoU has been negotiated and agreed upon between the agencies and bilateral donors mentioned above to facilitate the implementation of the NCCoPP. *(This change has been suggested by the 1st Core Group Meeting; to be finalized and approved by the 2nd Core Group Meeting)*

Definition(s)

In the following, "agency" refers both to the two bilateral agencies (GTZ for Germany, Infras for Switzerland) as well as to UNDP, UNEP and UNIDO. The following assumes that the overall project "National CFC Consumption Phase-Out Plan focussing on the Refrigeration Service Sector", abbreviated "NCCOPP", consists of several separate activities.

(a) **Validity**

Additional funding has been provided with the approval of the plan for the activities

- Refrigeration and Air Conditioning Service Sector Plan, RACSSP, and
- Customs and Policy Training Project.

Existing activities with existing responsibilities have been associated with the NCCOPP:

- Sectoral phase-out plan for elimination of CFCs in the foam sector (approved at 37th Meeting)
- Plan for phase-out of CFCs in the refrigeration (manufacturing) sector (approved at 38th Meeting)

This MoU covers all activities related to RACSSP and Customs and Policy Training Project, as well as the reporting requirements related to remaining activities under the foam and refrigeration manufacturing plans. *(This change has been approved by the 1st Core Group Meeting)* Remaining activities are those activities where funding has not been provided before the 42nd meeting of ExCom, and those activities where the agency responsible informs the lead agency that there is remaining funding from their activities funded prior to the 42nd meeting of ExCom which could be redistributed under the same mechanisms as laid out below.

The approved Agreement between India and the Multilateral Fund is annexed to this MoU. This Agreement and subsequent decisions of the ExCom directly related to this Agreement form the basis for this MoU. In case any of the terms in this MoU is in conflict with this Agreement or such subsequent decisions directly relating to it, the Agreement and the Subsequent decisions directly relating to it supersede the terms in this MoU.

(b) Agreed terms

1) The funding approved from the 42nd ExCom will be shared as defined in the approval.

2) Any two agencies can agree to a shift/ transfer between their shares, provided the lead agency agrees and India does not disagree, and provided the agreement between MLF and India leaves room for such a change or the MLF agrees. In case of such a transfer between agencies shares, their principle area of work (see next para) remains unchanged.

3) The concept of fixed agency shares in combination with the flexibility clause might require agencies to fund activities at the borderline of their usual tasks. E.g., UNDP might be required to fund trainings, or UNEP might have to purchase training equipment. GTZ will aim to minimize such cross-financing through flexible use of GTZs funds, but some cross-financing might still occur. All agencies agree that within the limits of their respective purchasing regulations, such cross-financing would be acceptable. The necessary technical expertise, i.e. TORs, expert evaluation of the deliveries etc. would typically be performed by the agency responsible for the principle area of work. Example: Germany funds trainings in Tamil Nadu, Switzerland provides TORs, and ensures the quality, Germany pays upon the Swiss assurance that the specifications have been fulfilled. Details will be defined in the annual business planning exercise as per 10) below.
   Note: Costs for technical expertise for these tasks are not covered by the support costs.

4) The principle responsibilities are agreed to be
   a) The **Government of Switzerland** and Infras as its Bilateral Agency is responsible for all training activities and the identification of equipment needs.
      i. Switzerland is responsible for the development of training materials for commercial and household refrigeration technician training.
      ii. Under the responsibility of Switzerland (TORs, supervision), new training cells will be identified and established.
      iii. In addition to the above, Switzerland is responsible for the training in all states and territories. The responsibilities include conducting training, identifying and reporting of equipment needs in beneficiary enterprises

and supporting equipment delivery to them, performing the necessary capacity building as well as other outreach functions.

iv. Switzerland will also provide first information about possible equipment beneficiaries and their requirements based on the information gathered through training preparation and training.

b) **UNDP**

i. UNDP is within the *service sector* phase-out activities responsible for *investment activities* on the basis of pre-defined technical requirements and beneficiaries; the pre-definition will be carried out by Germany - GTZ Proklima if not otherwise specified in the respective Annual Implementation Programme;

ii. UNDP is responsible for all *refrigeration manufacturing phase-out* activities. Within this joint responsibility, UNDP is specifically and solely responsible for the refrigeration manufacturing phase-out activities in all other sub-sectors of this activity except the sub-sector of transport refrigeration;

iii. UNDP is solely responsible for all phase-out activities in the foam sector.

c) **UNEP**

i. UNEP, within the service sector phase-out activities, will provide support through its Compliance Assistance Programme (CAP) within its existing mandate and resources available in the region and through its global information clearinghouse;

ii. UNEP will be solely responsible for the implementation of the customs and policy training activities as defined in the project proposal, based on activities shown in the Annual Implementation Programme;

iii. UNEP will be within the service sector phase-out activities responsible for the implementation of the necessary awareness activities as defined in the Annual Implementation Programme.

d) **UNIDO** is jointly with UNDP responsible for all phase-out activities in the transport refrigeration sub-sector.

e) **Germany** will monitor and coordinate, liaise with Ozone Cell, the PMU and the MLF, perform capacity building for the Ozone Cell and will concentrate on the remaining areas (additional investment, retrofits, ...) as well as support the other agencies where necessary.

The definition of "responsibilities" in this context is that the respective agency ensures the quality of the work performed under their responsibility through defining the needs, establishing TORs, ... Typically, but not necessarily, this agency will also fund the associated implementation measures. Details will be discussed in the annual work plan discussions (see paragraph 5).

5) The exact definition for the tasks to be carried out will take place in the annual work planning process, which is tentatively planned for each September.

a) The work planning process will define the tasks for the upcoming year, associate them with estimated funding and define which agencies are responsible to carry them out. It is planned to have a mid-term review of the activities as well.

b) The activity year will start in April and end in March, in line with the window for technician training ranging from September to March (off-season).

c) The business plan will be discussed in the Core Group chaired by Ozone Cell, Secretariat by GTZ-Proklima, having as permanent members aside from Chair and Secretariat the PMU and the other agencies. There can be invitees such as experts, stakeholders, ... Voting rights are with the permanent members only.

6) In case of non-performance of the project and subsequent reduction of agreed funding tranches by ExCom, the funding reduction will be distributed along the following principles:

a) Reduction because of failure of any agency to deliver agreed activities: The responsible agency will cover the reduction from its share. Note: The business plan will note if certain activities of one agency are needed as a input for subsequent activities of another, and when the mutually agreed delivery of those activities will be. In case that such input is delivered too late, the associated reduction will be covered by the agency with late input delivery.

Reduction because of failure to achieve sustainable reductions in CFC consumption, while agreed activities have been performed: Proportional decrease of the funding for all agencies.

7) The MLF is requesting India as well as Germany to agree to a consolidated reporting of all ongoing projects in India, in particular of the CFC phase-out plans. Germany will facilitate that process, based on a report to be prepared and submitted by GTZ, further to obtaining mutual agreement between the Ozone Cell and the lead agencies UNDP and GTZ about the data to be reported.

8) This MoU can be amended as needed on the basis of Core Group decisions insofar as the amendments have no impact on its substantive content. These amendments can then be annexed to the MoU. *(This change has been approved by the 1st Core Group Meeting).*

PROJECT COVER SHEET

COUNTRY:	India
IMPLEMENTING AGENCY:	Germany (Lead) Switzerland, UNDP, UNEP
PROJECT TITLE:	National CFC Consumption Phase-out Plan
PROJECT IN CURRENT BUSINESS PLAN(s):	Included in Business Plans 2002, 2003, 2004
SECTOR/SUB-SECTOR	Refrigeration / Service
ODS USE IN SECTOR [year]:	1502 ODP tons [2001]
PROJECT IMPACT	Total Phaseout of CFC-12 consumption in India Eligible consumption: 847 ODP tons
REMAINING ODS USE IN SECTOR [2010]:	0
PROJECT DURATION:	72 Months
PROJECT COSTS (MLF related part of project):	
Share of remaining tons eligible for funding of consumption in sub-sector	58.34 %
Remaining eligible project cost	US$12,656,670
REQUESTED FIRST TRANCHE:	US$ 1,272,288
LOCAL OWNERSHIP:	100 %
EXPORT COMPONENT:	0%
REQUESTED MLF GRANT:	US$ 12,656,670 (to be released in tranches for the entire sector plan)
IMPLEMENTING AGENCY SUPPORT COST:	US$ 1,201,998 (entire sector plan)
FIRST TRANCHE AGENCY SUPPORT COST:	US$ 120,189
TOTAL COST OF PROJECT TO MLF:	US$ 13,858,668 (entire sector plan)
COST OF FIRST TRANCHE TO MLF:	US$ 1,392.477
OVERALL COST-EFFECTIVENESS (MLF PART)	US$ 8.43/ kg ODP US$ 14.94/kg eligible ODP
ADDITIONAL FUNDING:	Government of Switzerland (task specific) Equivalent services value: US$ 1'250'869
PROJECT MON. MILESTONES INCLUDED:	Yes
NATIONAL COORDINATING AGENCY:	Project Coordinator / Ozone Cell, MoEF

PROJECT SUMMARY

This phase-out plan, being the last MLF funded undertaking dealing with CFC consumption, will support the Government of India in eliminating entirely India's CFC consumption. The remaining consumption in the refrigeration sector will be dealt with in one component of the plan through a number of training and equipment support measures enabling good practice and retrofit. Expected natural retirement of equipment will further support reduction in CFC-12 consumption. Starting with a significant outreach effort, the component implementation will last until 2009. A second component, the policy and customs training strategy, will provide much-needed assistance to the Government of India to ensure optimum outreach of all measures and will be finished in 2007. Any other funding necessities for remaining CFC consumption in India would be covered under this plans through the flexibility provided through the agreements between the Government of India and the MLF.

IMPACT OF PROJECT ON COUNTRY'S MONTREAL PROTOCOL OBLIGATIONS

The project will entirely phase out CFC consumption in India.

Component Service Sector Strategy: Prepared by: S. Sicars, GTZ-consultant (lead), in cooperation with MoEF, Switzerland, UNDP, UNEP, local experts and stakeholders: Aug. 18, 02, updated April 15th, 03 September 10th, 03 and February 26nd, 04; Reviewed by Martien Janssen, Re/Gent Consultancy, The Netherlands on Aug. 23, 02

Component Policy and Customs Training: Prepared by UNEP in cooperation with MoEF. local experts and stakeholders

Glossary of Acronyms used in the document:

CFC	Chloro Fluoro Carbons
GTZ	German Technical Cooperation Agency
ExCom	Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol
DEX	UNDP Direct Execution modality
INFRAS	Swiss Technical Cooperation Agency
ITI	Industrial Training Institute
HIDECOR	Swiss funded servicing sector programme preceding NCCOPP
MOEF	Ministry of Environment and Forests
MOU	Memorandum of Understanding
NCCOPP	National CFC Consumption Phase-Out Plan
ORG	Organizer of a TC
RAC	Refrigeration and Air Conditioning
RBAP	UNDP's Regional Bureau of Asia and the Pacific
REC	Recruiter of a TC
RMO	Regional Management Organization
RSE	Refrigeration Servicing Enterprise
RSET	Refrigeration Servicing Enterprise Training Institute of a TC
SPPU	UNDP-related Sector Plan Phase-out Unit in New Delhi
TC	Training Cell
TOT	Training of the Trainers
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization

Component 1

SECTOR STRATEGY

FOR PHASE-OUT OF CFC-12 CONSUMPTION

IN THE

INDIAN REFRIGERATION AND AIR CONDITIONING

SERVICE SECTOR

PREPARED FOR

OZONE CELL, MINISTRY OF ENVIRONMENT AND FORESTS, INDIA

WITH TECHNICAL ASSISTANCE FROM

GTZ, GERMANY

BUWAL, SWITZERLAND

UNDP

UNEP

August 2002 with updates

April 2003, September 2003, January/February 2004

1 LIST OF CONTENTS:

2 GENERAL INFORMATION

The objective of this refrigeration service sector plan for India is to assist the Government of India to meet its compliance target for the CFC-12 consumption in 2007, and to ensure the complete phase out of India's CFC-12 consumption in the service sector before 2010. A total consumption of 1502 ODP tons (of that 876.2 ODP tons eligible) of CFC-12 will be phased out under this sector plan. This project is the last project dealing with CFC-12 consumption in the refrigeration sector, leading to a complete phase-out of CFC-12 use in the refrigeration sector as well as in all other uses except for MDIs.

Dealing mainly with the refrigeration service sector, this project is the final CFC consumption phase-out project in India. Through the efforts under this phase-out plan and others approved before, India will be able to fully comply with the phase-out of CFC consumption as required by the Montreal Protocol, including consumption phase-out associated with chillers or MDI.

To achieve these objectives, the Refrigeration Service Sector Phase-out Plan proposes

1. To facilitate the CFC-12 phase out in India on the basis of already existing policies and regulations as well as financial support available to this project, and to include within this project the phase-out of CFC-12 consumption in potentially remaining small-scale assemblers of refrigeration equipment.
2. To support responsible use of refrigerant by training, equipment support, recovery and recycling, retrofit and technical assistance activities including replacement of CFCs during equipment repair, in order to minimize, and eventually eliminate, the use of CFCs

The plan includes necessary technical assistance components for strengthening the capacity of the country to carry out investment, regulations and awareness activities. It also proposes an implementation modality, including a monitoring component, to ensure the successful and effective implementation of this Refrigeration Service Sector Phase-out Plan.

The monitoring component is crucial to achieving the overall objective of this Refrigeration Service Sector Phase-out Plan, as the monitoring will ensure effective placement of resources and disbursements will be linked to confirmation of achievement of CFC reduction targets.

The plan is a unique document, developed to a large extent in India, with vivid support from Indian stakeholders, based on an – for MLF projects - unusual amount of data. Networking based on an Indo-Swiss-German project in the refrigeration sector and experience from a Swiss funded refrigeration training support programme formed an important basis for this work, and increased the accuracy and quality of it.

The structure and size of the remaining actors in the Indian refrigeration sector, which are largely small and micro enterprises, have been investigated in detail. The skill and equipment level, the low consumption associated with each company and the limited cooperation within the sector are based on national, often cultural circumstances which can and should not be changed for the implementation of a sector plan.

The refrigeration service sector provides a sizeable amount of jobs for school dropouts, people who have often learned their professions over decades with no or minimum pay associated, now being too old to start this process afresh. The costs of upgrading these entrepreneurs sufficiently that they can continue to earn enough for living belong also to the incremental costs directly associated with CFC phase-out. Both the political determination of the government to avoid placing them out of work as well as the legal aspects disallow for any attempts to force smaller entrepreneurs into larger companies just for the sake of most effective use of funds. Consequently, the challenge of this sector plan is to phase out a considerable amount of consumption in a vast number of enterprises with minimum socio-economic impact. .

The CFC consumption in the Indian refrigeration sector and in particular in the service sector is extremely widespread, and the amount of "low hanging fruits", i.e. enterprises with a sizeable consumption is low; less than 100 companies have a consumption above 500 kg CFC-12 per year, reaching a total of not even 7% of the consumption targeted within this plan. To phase out the first 10% of the CFC targeted in this plan, 250 enterprises have to cease completely to use CFC-12; the next 10% require already another 800 enterprises, and the ratio is worsening. This leads to consequences concerning measures to be implemented. E.g., while recovery and recycling (R&R) plays an important role, it can not be the main thrust under this plan due to the widespread use and the proven limited saving potential of R&R. Instead, responsible use of CFC through a bundle of measures such as minimizing charging weight, proper pressure testing and leak detection, and avoidance of presently frequent failures will minimize CFC consumption. To adhere to such practices is not only a question of awareness or even training: in almost all cases, the necessary tools are not available to adhere to good practices.

A tremendous problem in terms of CFC consumption are the domestic refrigerators in the country. India's production has increased significantly over the past decade, often with rates of about 15% to 20% per year. While the average lifetime of a refrigerator in industrialized countries is estimated at 13 to 15 years, it is typically even longer in a country like India. The older the refrigerators get, the more frequent they have to be repaired. The survey indicates a consumption of more than 800 tons for domestic refrigeration alone, and the average age of the CFC refrigerators is increasing while the number in use will decrease only very slowly due to the small production numbers 15 years ago. A number of good service practices and the supply of the necessary tools will reduce the CFC consumption during the service. At the moment it is estimated that more than 30 million CFC refrigerators being used, their service demand is expected to peak only in 2006 at 22% more than today and decline afterwards slowly. The stop in manufacturing on January 1st, 2003 will lead to a decrease, but only a gradual one, and even in this scenario CFCs for service would be needed until 2017, with 19 million CFC refrigerators still existing in 2010. Given the importance of a refrigerator for food preservation and, thus, public health, and the sizable portion of the annual income of many Indians needed to purchase a refrigerator, the strategy will also focus on establishing the infrastructure in terms of equipment and training needed for conversion and subsequent

service of retrofitted refrigerators, including measures to provide sufficient access to equipment and tools.

The beneficiary will contribute to the efforts by burying a small portion of the training and equipment costs, which will through a revolving mechanism be used to co-finance further implementation measures. Additional support will be provided by Switzerland through the Indoa-Swiss HIDECOR project, carrying out certain implementation related tasks (training, ...) without costs for the Sector Plan.

The intention of service enterprises to acquire und utilize new skills and equipment – independent of the associated costs – is directly linked to the awareness about the issue of ozone depletion and the unavoidable change resulting from the obligations India has under the Montreal Protocol. Consequently, an awareness component has been drafted for this sector plan, increasing the awareness about the service capabilities of service enterprises and thus stimulating demand for equipment and training, but also targeted at the service enterprises directly and the access roads to reach them. A newsletter distributed to those who have been supplied with training and equipment will not only advertise the non-consumption of CFCs, but will also form an incentive for more enterprises to join and, finally, will be the means to continuously influence the target group directly. Finally, important stakeholders, in particular the government structures in the states, are being addressed through workshops, and the important inter-state network capacity for implementation is being strengthened.

In order to effectively implement this project, a strong implementation structure is necessary, which should at the same time not be overly costly. Implementation falls into three different functions: The start up, which includes identifying the necessary access roads, detailing the demand even further, establishing subdivisions in different parts of India. The second function is the ongoing management once the system has been established, and the third is the monitoring of the impact.

In the startup phase, significant additional work is necessary because of the size of the country, the wide variety in cultures within, and the numbers of enterprises dealt with. Local availability of equipment and the control of its quality has to be ensured, an outreach structure needs to be established, suitable training institutes all over India need to be identified. In this phase, the reduction in CFC consumption will be relatively low, while the expenses are significant even assuming the majority of the work being performed in India.

During implementation, the management structure needs to be small and flexible. One responsible project manager reporting to the Director Ozone Cell, Ministry of Environment and Forests, will be sufficient. He will - based on requests from a steering committee headed by said director and consisting inter alia of representatives of the implementing agencies - issue requests for different implementation activities carried out by the implementing / bilateral agencies, keep track of costs spend, and initiate the necessary monitoring activities to be carried out by external experts. In addition, he ensures information exchange with MoEF and other sector plans, in particular the production sector phase-out. The project manager will be supported by one additional person with higher education. This manager will be hired

during 2003 and will stay until the end of 2009 to finalize the reporting duties under this plan. The overall responsibility for the implementation lies exclusively with Ozone Cell, MoEF.

3 IMPACT OF THE PROPOSAL

This proposal will completely phase out the use of CFC 12 in the refrigeration service sector. A total consumption of 1502 tons of consumption (of that 876.2 tons eligible) will be eliminated in this sector, which includes any possibly remaining consumption in the refrigeration assembly sub-sector.

The CFC-12 refrigeration service sector plan is meant to phase out completely the remaining CFC-12 and will be also the last Multilateral Fund project phasing out CFC consumption in India. Parallel to this project, a number of existing projects belonging to the refrigeration sector and targeting other areas of its consumption have been approved and are presently being implemented; intensive coordination between the different projects ensured that they exactly fit into India's need pattern, and that no double counting takes place.

A detailed survey has been carried out to determine the consumption in the enterprises forming the refrigeration service sector, largely consisting of service enterprises and institutionalized large owners of ODS equipment employing their own service technicians. A detailed overview over the use of CFC-12 by segment is provided in the table 5 in chapter 5.9.

India obliges to completely phase out the use of CFC-12 in the refrigeration service sector under this project. In addition, India obliges to completely phase-out CFCs as per Montreal Protocol requirements under this and other already approved Multilateral Fund projects, without the need for any future funding by the Multilateral Fund.

4 DATA COLLECTION AND VALIDATION

4.1 General

In order to obtain a sufficient overview over the refrigeration sector and its consumption, two independent assessments of the consumption have been carried out.

A horizontal census-like survey covered cities inhabited in total by more than 50% of India's urban population, covering all major cities completely as well as representative samples of towns down to as few as 10'000 inhabitants. The survey covered all of India's States. This census-like survey, attempting to identify and visit every refrigeration service providing enterprise in the towns borders, was extrapolated utilizing a classified breakdown of the cities into different classes, as well as the regional patterns found in the survey. The survey covered all of India's States. A detailed questionnaire was used to obtain a variety of information. Due to the magnitude of the survey, the amount of data obtained per enterprise was limited. This survey provides an overview over all enterprises which predominant business is refrigeration or air-conditioning and which could be identified during the off-peak season (survey carried out December-March). It is important to note that the survey did not include the

- roadside technicians working only during the summer time (peak) in refrigeration service, in off-peak time earning their income with other professions
- institutional users of refrigeration equipment which have predominantly other objectives of their operation, which need refrigeration or air conditioning as means for their production and have established their own service department. This group includes e.g. chemical and other manufacturing companies, Indian Railways, State Tourist Boards with a/c buses etc.

A vertical survey gave a detailed assessment of the different sub-sectors, based on expert visits at several company sites, detailed discussions with a number of experts in multiplying organizations (compressor manufacturers, service coordinators of household refrigerator manufacturers, ...), manufacturing data and lifetime information.

Approach and results of both surveys are presented in chapters 4.7 to 4.9 below.

4.2 Responsibility for ODS Phaseout in India

Chlorofluorocarbons (CFCs), among them CFC-12, are mainly used as refrigerants in refrigeration and air-conditioning industry, as blowing agent in polyurethane foams, as solvents in electronic and metal industries, and as aerosol propellants. CFCs are chemically stable, non-toxic and non-inflammable but have an adverse impact on the environment in the long run, depleting the ozone layer and thus allow harmful ultra violet radiations from the sun to reach the earth's surface. The Montreal Protocol stipulates that CFCs are to be completely phased out by 2010 in certain countries, among them India.

The CFC phase out in India is implemented and monitored by the Ministry of Environment and Forests (MOEF) with the Ozone Cell as the nodal unit.

4.3 CFC availability in India

4.3.1 Production of CFCs

As per the Montreal Protocol, Indian Plants producing CFCs will have to completely phase out manufacturing CFCs by the year 2010. Currently, there are four CFC producers in India. The CFC producers are represented jointly by Refrigerant Gas Manufacturers Association (REGMA). As per the agreement between REGMA and MOEF, each enterprise is prescribed an annual quota for the CFC production by MOEF.

As per the agreement under the Montreal Protocol with Multilateral Fund. India has agreed to freeze the country production level of CFCs to that of production in 1999, which is 22,588 Tons and to reduce the production on a linear basis. Details of the annual production, phase out are provided in the table 1 below.

Table 1: India's maximum production obligation for all Annex A Group I substances as per Montreal Protocol and maximum production quota as per agreement with the Executive Committee of the Multilateral Fund

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Maximum production [ODP tons] as per MP obligation	22'588	22'588	22'588	11'294	11'294	3'389	3'389	3'389	0
Production quota [ODP tons] as per agreement with MLF	16'941	15'058	13'176	11'294	7'342	3'389	2'259	1'129	0

4.3.2 Consumption of CFCs

India has been a CFC exporting country for many years, resulting in a lower consumption than production. Consequently, the maximum allowed CFC consumption (based on historical consumption figures) under the Montreal Protocol is smaller than the maximum allowed CFC production and represents therefore the restricting factor in CFC availability in the country. The respective maximum consumption figures are given in table 2.

Table 2: India's maximum consumption obligation for all Annex A Group I substances as per Montreal Protocol

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Maximum consumption [ODP tons]	6'681	6'681	6'681	3'340	3'340	1'002	1'002	1'002	0

4.4 Legal situation

4.4.1 Ozone Depleting Substances (Regulation and Control) Rules 2000

In accordance with the National Strategy for ODS phase-out the Ministry of Environment and Forests, Government of India, has notified the "Ozone Depleting Substances (Regulation and Control) Rules 2000", covering various aspects of production, sale, consumption, export and import of ODS. These Rules were notified in the Gazette of India on July 19, 2000.

Some of the important provisions of the Rules are as follows:

- Authority has been specified to *issue license for all imports and exports of ODS* and products containing ODS. The export of CFCs to Non-Article 5 countries has been banned.
- The Rules *prohibit the use of CFCs in the manufacturing of refrigeration products* as well as various other products from *1.1.2003* onwards. Exempted are use in metered dose inhalers and for other medical purposes. HCFCs can be used as interim substitute to replace CFC, these are allowed to be used up to 1.1.2040.
- The Rules also provide for *compulsory registration of* ODS producers, *manufacturers of ODS based products, as well as importers, exporters, stockist and sellers of those*, the same provision being *applicable to manufacturers, importers and exporters of compressors*. They are also *required to maintain records and file periodic reports* for monitoring production and use of ODS.
- In addition to agreements between the beneficiaries of MLF (Multilateral Fund) projects and the government, enterprises which have received financial assistance from the MLF

for switchover to non-ODS technology have to register the date of completion of their project and declare that the equipment used for ODS has been destroyed. *Creation of new capacity or expansion of capacity of manufacturing facilities of ODS and ODS based equipment has been prohibited.*

- The Rules define the phase-out dates for the consumption of ODS in India as provided in table 3.

Table 3: Phase-out dates as per ODS rules

Name of Activity	Phase-out Date
Manufacture of Aerosol products or pressurized dispensers (excluding metered dose inhalers for medicinal purpose).	1-1-2003
Manufacture of polyol for foam products	1-1-2003
Manufacture of foam products including foam part of Domestic Refrigerator.	1-1-2003
Manufacture of Fire Extinguishers or Fire Extinguishing Systems.	1-1-2001
Manufacture of Mobile Air-Conditioners and charging at Automobile industry	**1-1-2003**
Manufacture of other Refrigeration and Air-Conditioning products (excluding compressors – repair market)	**1-1-2003**
Servicing of fire extinguishers and fire extinguishing systems.	1-1-2010
Manufacture of Metered Dose inhalers for medicinal purposes.	1-1-2010
Manufacture of different products using HCFC	**1-1-2040**
Use of methyl bromide except preshipment & quarantine	1-1-2015

4.4.2 Relation to Policy and Customs Training Strategy

The Policy and Customs Training Strategy/Project prepared by UNEP and submitted jointly with the Service Sector Plan foresees a number of measures which will be coordinated with the Service Sector Plan.

Contrary to the situation in most countries, the coordination between Service Sector Plan and the Policy and Customs Training Strategy/Project does only to a smaller extent refer to the customs training planned. India's situation as one of the leading CFC-12 producers with no legal CFC-12 imports decreases the significance of reporting procedures for the Service Sector Plan in comparison to those countries where imports are used to cater the consumption needs of the service sector. Enforcement on the borders is nevertheless necessary to preserve

the relatively high CFC-12 price level in the market, since illegal imports threaten that price level and would subsequently complicate the efforts to minimize CFC-12 use.

The Service Sector Plan is highly interlinked with the structures of the Government of India and the State Governments. Consequently, the related officials and their superiors need to be informed about the overall objective of ODS phase-out, but also about some basics information about chances and responsibilities under the Service Sector Plan. This is the basis which the Service Sector Plan will use for sustainable monitoring of implementation, CFC consumption reductions etc., but also for improvements in the availability of alternatives and for a more widespread availability of information. The following departments being addressed under the Policy and Customs Training Strategy/Project are especially important for the implementation of the Service Sector Plan:

- The Ministry of Chemicals and Petro-chemicals is responsible for implementation of the Petroleum Act, 1934 and Petroleum Rules 1976 etc. which have provisions relating to handling of various classes of petroleum products, some of which are substitutes to CFC-12. The responsibility of the Ministry for inputs on logistics associated with petrochemical products is a further link with potential CFC-12 replacements.
- The Explosives Office is responsible for dealing with potentially hazardous substances used as non-OD substitutes. This department needs to be sensitized to the need for conversion to CFC-12 alternatives and related policies, similar to the ministry of Chemicals and Petr-chemicals above.
- The State Pollution Control Boards (SPCBs) will fulfill some roles in the monitoring of the implementation of the Service Sector Plan, in particular from 2005 onwards when the implementation reaches a large scale.
- Similarly, officials of the Industries Department can monitor implementation of the Service Sector Plan in small, medium and large industries.
- Information and publicity departments play important roles in creating public awareness through newspapers, radio, T.V, and other means of mass communication, and need to be aware of national and state contact institutions for the Service Sector Plan.
- In order to ensure that ODS use is minimized in existing defense related refrigeration systems, it is necessary to train some officials.
- The Industrial Training Institutes under the Ministry of Labour are already reorienting their training contents to ensure that trainees are advised in the adequate use of CFC-12, recovery and recycling, retrofit and CFC-12 substitutes. The related authorities in the States need urgently further input to provide the necessary leeway for the ITI principals to fully support the Service Sector Strategy.

The timing of the training foresees training of officials of central ministries, state governments and district officials from mid of 2004 until end of 2006. This allows training of those officials in parallel to the increase of activities under the Service Sector Plan, ensuring

optimum preparation and responsiveness of the officials for the needs of and tasks under the Service Sector Plan.

Both UNEP as a project partner of the Service Sector Plan as well as the Ozone Cell in its coordinating role will ensure that the information needs of the Service Sector Strategy will be reflected in the respective activities of the Policy and Customs Training Strategy/Project.

Specific information dissemination, task assignment and monitoring of the activities of officials performed under the Service Sector Plan are addressed under that plan. The awareness component under the Service Sector Plan (see chapter 5.6) addresses specifically only the awareness of refrigeration technicians and their supply chain.

4.4.3 Measures supporting introduction of alternative technology

The Government of India has decided to grant full exemption from payment of Customs and Excise duties on capital goods required for ODS phase out projects funded by the Multilateral Fund already in 1995. The Government extended the benefit of Customs and Excise duty exemptions for ODS phase-out projects which were eligible for funding under the Multilateral Fund, whether or not such enterprises actually sought assistance from the fund. The benefit is available subject to the condition that enterprises give clear commitment to stop using ODS in all future manufacturing operations after the projects are implemented.

The benefit of duty exemption has been extended for new capacity with non-ODS technology as early as 1997; in the same year, Indian financial institutions have decided not to finance/re-finance new ODS producing/consuming enterprises. This provided an early incentive to establish new ODS-alternative manufacturing capacity in the country and helped to facilitate the ODS-phase-out in the manufacturing of goods.

It is planned that these benefits will be extended to the Refrigeration Service Sector under similar conditions, thus supporting the acquisition of servicing equipment over and above what can be supported by a MLF funded project.

4.5 General remarks about the structure of the refrigeration sector

The consumption of CFCs in refrigeration occurs during manufacturing (and/or assembly) and subsequent servicing needs. Depending on the population of the equipment, service quality and age of the products, service needs can be significantly higher than the CFC needs in the manufacturing sector. The Indian refrigeration sector comprises of the following sub-sectors:

a) Domestic Refrigeration
b) Commercial Refrigeration
c) Unitary air conditioning (typically uses HCFC-22 only in such equipment)
d) Mobile Air-conditioning (MAC) . This may be subdivided into four sub-sections as follows:
    - Car AC servicing
    - Bus AC Servicing

- Train AC Servicing
- Passenger Ships/ Boats AC Servicing

e) Transport Refrigeration
f) Cold storage and Food Processing Equipment
g) Industrial Refrigeration Servicing.
h) Large size (Industrial Chillers) Equipment

The service sector provides supports to all of those segments. In most cases, the enterprises service several of these segments, being nevertheless focused mainly on one. A higher skill and equipment level is needed for the service of larger and more complex systems, which are also by far less widespread. The above list is sorted approximately by required skill/equipment level, the lowest level being a), the levels f) to h) being almost identical in terms of requirements.

4.6 Situation in the refrigeration equipment manufacturing sector

4.6.1 Domestic refrigeration industry

This industry in India is about 35 year old. Considered as luxury item, with limited sales of about 0.2 million up to early 80's, the domestic refrigerator industry really started growing from 1980-81. At present there are 6 major players and the established capacity of the industry is about 3.8 million but about 2.5 million units were manufactured in 1997-98. At present the domestic refrigerator industry produces about 3 million units annually. Some of the refrigerator manufacturers are fully integrated manufacturing both appliances and compressors; others outsource their compressors.

All these manufacturers were using CFC-11 as foam blowing agent for insulation and CFC-12 as refrigerant. With funding from the MLF most of them have changed to non-ODS foam blowing agent and have chosen cyclopentane as the alternative foam blowing agent.

All the domestic refrigerator manufacturers were using CFC-12 as refrigerant and have already or are presently converting to non-ODS substitutes. Most of them have chosen HFC-134a as the alternative refrigerant. One manufacturer, Godrej, has opted for hydrocarbon substitute for CFC-12.

Certain other factors concerning this sub-sector needs to be mentioned as they influence local design changes.

Refrigerators manufactured in India range in capacities from 65 litres to 380 litres. Refrigerators with semi-automatic defrost system are more common. No frost refrigerators have made recent appearance particularly in large size models. Refrigerators with single door, single evaporator, two temperature type with out side condensers are more common. Two or more door refrigerators with skin type condenser have made their appearance but only in larger sizes. They have to function sometimes at very high ambient temperature of more than 45°C over sustained periods. The supply voltage fluctuates widely (range 150 V to 280 V) and

although over size motors and voltage stabilizers (built in) attempts to minimize effects, burn outs are quite frequent.

Refrigerators are common only in urban areas, penetration level in rural areas is very low. There is rapid growth in the industry and it is undergoing a major change in structure.

The complete refrigerator manufacturing industry within the country is converting before January 1st, 2003 as per ODS Rule 2000 requirement.

4.6.2 Commercial refrigeration industry

The Commercial Refrigeration sector was a large consumer of ODS consisting of small and medium enterprises manufacturing visi coolers, water coolers, chest freezers, display cabinets, ice candy machines, soda fountains etc. often designed as per customers requirement. This sector consists of both organized and unorganized sub-sectors in varied proportions. They use both hermetic and open type compressors from indigenous sources.

This sector was using CFC-11 for foam insulation and CFC-12 as refrigerant but are rapidly changing over to R-141b as interim foam blowing agent and R-134a as refrigerant assisted by MLF funding.

So far 29 projects in Commercial Refrigeration have been identified including three group projects in this sub-sector and with a total of 43 enterprises and their ODS phase out involving a total of 460.8 MT of ODP were approved. Out of these, 20 projects are completed and the remaining are under implementation and will be completed soon. Final umbrella projects are under preparation for the complete phase out of ODS from this sector, to be submitted to the 38th ExCom by UNIDO and UNDP. .

4.6.3 Mobile Air Conditioner (MAC) industry

In India, mobile air conditioners have been popular mainly in the urban areas but the market for MACs has been growing rapidly. Traditionally, CFC12 has been used as a refrigerant in Car ACs in the country. For the last few years, HFC134a refrigerant is being used in most of the recently introduced cars in India. However, Maruti, a leading car manufacturer has still been using CFC12 refrigerant in car ACs in its popular car models, namely, *Maruti 800, Zen and Esteem.*

There are currently three major manufacturers of MACs in India, with combined capacity of 250,000 MAC units per year. The MAC sector has been using CFC 12 as a refrigerant but is also gradually phasing out the CFC and instead using HFC 134a..

4.6.4 Other uses

There are a variety of other uses in the refrigeration sector which also require service, in particular larger refrigeration equipment in industry, food processing, storage etc. The chillers used in India will be covered under the "India Chiller Sector Strategy" by The World Bank.

4.7 Horizontal Survey Service Sector

4.7.1 Scope and objective

The broad objectives of the survey include:

- Identification of agencies/units, both formal and informal, which service RAC equipment.
- Understand the preparedness of these service units in managing phase out in the RAC service sector and to adopt new non-ODS technology.
- Understand the support required for managing the phase out.

The scope of work to achieve the objectives listed above is detailed below.

- Assessment of agencies/units, both formal and informal, which service RAC equipment in terms of:
    - Identification of servicing units
    - Geographic distribution including spread into large cities and urban areas
    - Type of operations (whether service only, service cum assembly etc.)
    - Types of customers catered to by the enterprises (individuals, businesses, factories etc.)
    - Status of registration.
- Profile and scale of operations and profile of individual servicing units
- Servicing practices followed
- Tools used by the agencies
- Fees charged for different types of services
- Procurement of refrigerant (ODS and non-ODS)
- Credit and financing mechanisms used for the business
- Training programs attended/skill development mechanisms for technicians
- Whether equipment based on ODSs is retrofitted with non-ODS technologies
- Level of awareness of the Montreal Protocol and its impact on servicing sector
- Awareness on ODS regulations and its expected impact
- Servicing skills with use of non-ODS alternative refrigerants
- Training requirement for better practices and servicing equipment based on non-ODS alternatives.
- Intention of the firm to upgrade equipment to meet market demand through good skills and practices.
- Other key issues faced.

The above information has been captured through structured questionnaires. A professional organization for market research, ORG-MARG, carried out the survey.

4.7.2 Geographic coverage

The survey was carried out India wide in all towns up to class-I (classification see table 4) i.e. with a population of more than 500'000. The rest of towns i.e. up to class-IV was selected by