

#### 4. PROJECT DESCRIPTION

The Sectoral Phase-out Plan for elimination of CFCs in the Foam Sector in India will be implemented through a combination of investment, technical support and management components.

##### 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:

- 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
- 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

The approach for implementing the investment component in the remaining eligible and unfunded enterprises in the foam sector (listed in Annex-2) is proposed to be through a combination of individual and group sub-projects as below:

Rigid foam (general insulation)	Five individually executed sub-projects	56.7 MT ODS Phase-out
Rigid foam (thermoware insulation)	Twelve individually executed sub-projects	116.5 MT ODS Phase-out
Rigid foam (spray/insitu insulation)	One group sub-project	114.2 MT ODS Phase-out
Rigid foam (SMEs)	Two group sub-projects, each covering 20 enterprises	94.1 MT ODS Phase-out
Flexible molded and integral skin foam	Twenty individually executed sub-projects One group sub-project covering 8 enterprises	230.3 MT ODS Phase-out
Chemical systems houses	Six individually executed sub-projects	N/A
<b>TOTAL</b>		<b>611 MT ODP</b>

This approach draws on previous implementation experience and has been designed based on the size, level of organization, location and customer base of enterprises concerned and also based on ease and convenience for execution and management.

It is foreseen that the durations for the sub-projects would be set in such a way as to ensure that the verifiable annual performance targets as may be required for the Sectoral Phase-out Plan, would be more conveniently quantifiable and achievable.

CFC phase-out in ineligible enterprises is expected to take place through the control, which the Government will have through regulatory actions. Any additional unaccounted or unidentified eligible enterprises will be identified and accommodated within the resources approved for this sector phase-out plan.

Given the generally small size of the remaining enterprises in the sector, with inadequate in-house technical capabilities, the need for adequate investments for plant and process changes, supported by investments on adequate technical assistance, trials and training, is critical and will involve proportionately larger investments covering the following:

#### 4.1.1 Plant and process investments

- a) New formulations suitable for the selected alternative technology will be required. These will be available from existing chemical suppliers. No specific investments are foreseen for handling of raw chemicals.
- b) The use of new formulations will lead to a marginal change in mixing ratios and increased viscosity leading to reduced flowability of the chemical mixture. In case of rigid foam conversions, the HCFC-141b based foam will have an increased thermal conductivity in relation to that produced with CFC-11, which is being replaced. The existing manual mixing process or locally assembled low-pressure foam dispensers will not be able to handle the new formulations without adversely affecting the cell structure and thereby the thermal conductivity of the foam. Hand mixing is also not recommended from an occupational health and safety standpoint. New high or medium-pressure foam dispensers as applicable, of equivalent effective capacity, which will provide a finer cell structure and help minimize the deterioration of thermal conductivity of the foam, and also minimize the occupational health and safety risks, will therefore be needed to replace the existing dispensers/hand-mixing process. In case of spray/in situ foam applications, where high-pressure foam equipment exists in the baseline, retrofitting of this equipment to enable it to handle HCFC-141b based systems will need to be carried out. In case of flexible molded and integral skin foam conversions, the existing foam equipment will need to be retrofitted to handle the new formulations.
- c) For rigid foam conversions, the HCFC-141b based foam will have an increased molded density with respect to the CFC-11 based foam, resulting in increased requirement of chemicals. This increase will be partially offset by the savings resulting from the more efficient handling of chemicals due to introduction of new foam dispensers. In case of flexible molded and integral skin foam conversions, while density increases may not be a source of process issues by using optimized formulations, these formulations are expected to introduce additional costs.
- d) For facilitating conversion of the baseline at the six remaining small system houses, adequate investments on plant and process will need to be made.

#### 4.1.2 Technical assistance

Technical assistance will be required to be provided through international experts and, when available, national experts to ensure a smooth transition to the new replacement technology. The experts would need to be process specialists and their functions will include overall technical supervision of conversion projects and technical coordination between equipment/chemical suppliers, recipient enterprises and the implementing and/or executing agency. Their specific responsibilities include:

- a) Technical assistance for preparing specifications of equipment to be procured in the sub-project
- b) Technical equipment bid evaluation from suppliers during the competitive bidding process
- c) Technical guidance to the recipient enterprise during start-up with the new equipment and process
- d) Resolving technical issues with the phase-in of the new equipment and processes
- e) Technical evaluation of the results of production and product quality trials jointly with the recipient enterprise
- f) Technical project commissioning including final technical inspection of equipment and process for establishing completion and compliance with project objectives such as the destruction of the baseline CFC-based equipment where applicable, verification of depletion of CFC stocks, and verifying that the non-CFC production process is in operation
- g) Technical evaluation of enterprise reimbursement claims on equipment, raw materials, local works and other items and certification of the same
- h) Technical clearance of project completion, so that the project assets can be handed over and the project closed.
- i) Technical assistance for completion and other reporting requirements.

### 4.1.3 Product and Process Trials

Trials will be required to validate the new/retrofitted equipment as well as the production process using the new chemical systems, specifically to establish their performance and suitability for the conversion in accordance with specifications and project objectives. Trials will also be needed to evaluate and establish satisfactory end product properties. Trial costs will cover the cost of chemicals, raw materials, components, consumables and utilities required during site preparation and commissioning.

### 4.1.4 Application and Process Training

Training will be needed to acquaint the production personnel in the enterprise with the new equipment, formulations and processes. Training will also be required to address safety and industrial hygiene issues, such as flammability, ventilation, and health hazards and to institute the required industrial practices as applicable to the replacement technology.

## **4.2 Technical Support Component**

Since the Sectoral Phase-out Plan will address the entire Foam Sector, the industry as a whole and the Government will need to be supported through provision of a technical support component for ensuring that their phase-out actions and initiatives are not only technically sound but also sustainable, and consistent with the important principles of the Country Programme, which are to prevent industrial dislocation and obsolescence. The Technical Support component will assist the Government and the industry for the following:

- a) Establishment quality and performance standards for each product and application within the sector
- b) Interaction with the user industry for providing technology assistance for sustainability of foam applications, through technical workshops and meetings
- c) Establishment of a training, certification and licensing program for foam technicians and operators

## **4.3 Management Component**

The implementation of the Foam 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 Foam Sector Phase-out Plan will be managed by a dedicated Management Unit, comprising of a coordinator to be designated by the Ozone Cell and supported by representatives and experts from the implementing/executing agencies and the necessary support infrastructure. The management component of the Foam Sectoral Phase-out Plan will include the following activities, for the duration of the Plan:

- a) Establishment and operation of the Management Unit
- b) Coordination of the Plan implementation with the various Government policy actions pertaining to the Foam Sector
- c) Awareness creation of the Foam Sectoral Phase-out Plan and the Government initiatives in the Sector among state-level regulatory environmental bodies as well as consumers and public, through workshops, media publicity and similar information dissemination measures as necessary
- d) Verification and certification of CFC phase-out in completed sub-projects within the Plan
- e) Reporting of implementation progress of the Plan
- f) Establishment and operation of a decentralized mechanism for monitoring and evaluation of Plan outputs, in association with state-level regulatory environmental bodies.

## 5. TECHNOLOGY

The selection of the alternative technology for conversion in the various foam sub-sectors, would be governed by the following considerations:

- a) Proven and reasonably mature technology
- b) Cost-effective conversion.
- c) Availability of the systems at favorable pricing.
- d) Critical properties that have to be obtained in the end product (such as thermal conductivity, dimensional stability, closed cell content, surface and skin properties and strength)
- e) Compliance with established (local and international) standards on safety and environment.

The technology selected would also need to be easily adaptable at the (generally small-sized) recipient enterprises, which predominantly would be participating in this project.

### 5.1 Rigid polyurethane foams

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

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

#### *Interim Technologies*

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

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

#### *Permanent Technologies*

Pentane based (n-, iso-, cyclo) systems require extensive safety related provisions/investments due to their flammability. Due to safety considerations, the use of pre-blended systems is not viable and additional investments for in-house pre-mixing are required. Cyclopentane has miscibility limitations with polyols. The molded densities and insulation values are still inferior to those obtained with HCFC-141b. The advantages are their relatively lower operating costs; they are environmentally relatively safe (no ODP/GWP or health hazards) and constitute a permanent technology. Hydrocarbons are thus, the preferred conversion technology for large and organized users, where safety requirements can be complied with and investments can be economically justified. In the present scenario, since most of the enterprises are small or medium-sized, application of hydrocarbon-based systems is not considered feasible.

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

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

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

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

## 5.2 Flexible molded polyurethane foams

The presently available/emerging CFC-phase-out technologies for flexible molded polyurethane foams are:

CLASSIFICATION	LIQUID TECHNOLOGY	GASEOUS TECHNOLOGY
Low ODP technologies (Interim)	HCFC-141b, HCFC-141b + water	HCFC-22 + HCFC-142b/141b
Zero ODP technologies (Permanent)	Water, Pentanes, LCD, HFCs	HFCs (134a)

### *Interim Technologies*

HCFC-22 has residual ODP. This technology requires investments on in-house blending facilities due to the low boiling point and is not a favored option due to availability of environmentally safer alternatives.

HCFC-141b has a boiling point near ambient temperatures and the technology is technically mature. No major changes in the auxiliary equipment/tooling in the production program are needed. However, HCFC-141b has residual ODP and is an aggressive solvent. This is not a favored option due to availability of other environmentally safe alternatives.

### *Permanent Technologies*

Pentane based systems have not been widely commercially used for such applications. They require extensive safety related provisions/investments due to their flammability. Due to safety considerations, the use of pre-blended systems is not viable and additional investments for in-house pre-mixing are required. Pentane based systems are not available locally. The advantages are their relatively lower operating costs; they are environmentally relatively safe (no ODP/GWP or health hazards) and constitute a permanent technology.

Gaseous HFCs have been used successfully but are not applied widely due to cost and availability factors.

Liquid carbon dioxide technology is a recent development, allowing injection of liquefied carbon dioxide to the chemical mixture. This technology offers the same environmental benefits as water-based systems, and allows production of foams with lower densities while maintaining product quality. However, the initial investments required are quite high, with complicated process controls and a substantial learning curve.

The conversion to water-based systems is relatively cost-effective and environmentally sound (zero-ODP/GWP, no health or safety hazards). Water-based systems have acceptable processing characteristics and are reasonably mature. Polyols suitable for water-based formulations, with or without pre-mixed additives are locally available. Therefore, the phase-out technologies for cold-cured molded flexible polyurethane foams in India, have for all practical purposes, converged to all-water blown high resilience foams using MDI technology. For these reasons, this technology will be applied for this sub-sector.

### 5.3 Integral skin polyurethane foams

Integral Skin polyurethane foams are characterized by a high-density outer skin and a low-density core. In addition to blowing the foam, blowing agents are required to perform auxiliary functions such as skin formation and decrease of viscosity. The presently available/emerging CFC-phase-out technologies, for integral skin polyurethane foams are:

CLASSIFICATION	LIQUID TECHNOLOGY	GASEOUS TECHNOLOGY
Low ODP technologies (Interim)	HCFC-141b, HCFC-141b + water	HCFC-22 + HCFC-142b/141b
Zero ODP technologies (Permanent)	Water, Pentanes, HFCs (245, 365)	HFCs (134a)

#### *Interim Technologies*

HCFC-22 has residual ODP. HCFC-22 has been seen to cause frothing in some similar applications in tropical environments. This technology also requires investments on in-house blending facilities due to the low boiling point and is not a favored option.

HCFC-141b has a boiling point near ambient temperatures and the technology is technically mature. No major changes in the auxiliary equipment/tooling are needed. Pre-blended HCFC-141b based systems are locally available. However, HCFC-141b has residual ODP and is an aggressive solvent.

#### *Permanent Technologies*

Pentane based systems have been recently commercially used for such applications, however the technology is not widely available. They require extensive safety related provisions/investments due to their flammability. Due to safety considerations, the use of pre-blended systems is not viable and additional investments for in-house pre-mixing are required. Pentane based systems are not available locally. The advantages are their relatively lower operating costs; they are environmentally relatively safe (no ODP/GWP or health hazards) and constitute a permanent technology.

Gaseous HFCs have been used successfully but have not been applied widely due to cost and availability factors.

Water-based systems are environmentally sound (zero-ODP/GWP, no health or safety hazards), have acceptable processing characteristics and have been commercially applied in recent years. However, water-based systems and the necessary technical support are not locally available. The costs of the systems are also prohibitive at present.

Based on the above, as interim replacements, HCFC-141b based systems satisfy market requirements on aesthetics and performance and are considered the most acceptable. HCFC-141b based systems are locally available. HCFC-141b (and partial water) based systems, as an interim step will be applied as the conversion technology in the sub-projects, until technologies for safe CFC-free alternatives, become mature and commercially viable. These can be then implemented with no additional investments.

### 5.3 Technology Selection

Based on the selection parameters for the technologies for various sub-sectors described earlier, the selection of the CFC replacement technologies in the remaining enterprises from the various foam sub-sectors can be summarized as below:

Sub-sector	CFC Consumption (MT)	Technology Selected
Rigid foam	382	HCFC-141b + partial water-based systems
Flexible molded foam	230	Water-blown systems

### 5.4 Additional Justification for HCFC technology

The implementing agency experts Prior to the preparation of this proposal appraised the prospective recipient participating enterprises in the rigid polyurethane foam sub-sector and had detailed discussions with the technical and managerial personnel of the enterprises, regarding the choice of technology for replacing the existing CFC-based technology, under the project. The enterprises were briefed in detail about the following:

1. An overview of the available interim (low ODP) and permanent (zero ODP) replacement technologies.
2. The techno-economic impact of each technology on the products manufactured, and the processes and practices employed by them.
3. The possible implication of each technology, in terms of its known impact on environment, health and safety, such as ozone depleting potential, global warming potential, occupational health, fire and explosion hazards.
4. It was emphasized to them that HCFC technologies are interim in nature due to their residual ODP and therefore may continue to adversely affect the environment, though at a lower scale than CFCs.
5. It was further explained that HCFCs use may become restricted under present or future international conventions and may also need to be phased out at a future date, and any investments required for their phase-out and for conversion to safer technologies, may have to be borne by them.

The enterprises indicated their preference for selection of HCFC-141b based technology, in their manufacture of rigid polyurethane foam insulation products. The specific justifications offered by them are as below:

Water-based systems were considered, but are unsuitable due to the unsatisfactory insulation values, density and other end-product properties, which will affect their competitiveness.

They considered hydrocarbon-based systems unsuitable due to the following factors:

- a) The fire, explosion and security hazard and compliance with local safety regulations involved in the storage and handling of hydrocarbons, in view of their flammability. In the present premises of these enterprises such compliance is not possible. At the present time, it would not be cost-effective or viable for them to relocate their manufacturing facilities to ensure such compliance.
- b) Since hydrocarbons cannot be pre-mixed in polyols due to the safety hazard they present in transportation, additional investments on in-house premixing equipment will be required. Considering their low volume of production, such investments are not economically viable.
- c) In view of safety considerations, additional and continuous monitoring of plant operations by statutory authorities will be needed. The plant operators will need additional retraining for safety practices. The insurance premiums will increase. This will add to the burden of recurring costs.

In view of the above, the enterprises manufacturing rigid polyurethane foam, selected HCFC-141b (+ partial water) based systems, as the conversion technology, which will ensure quick phase-out of most of the ODP, while maintaining products competitive and the properties at acceptable levels.

## 6. INCREMENTAL COSTS

The incremental capital and operating costs for the Foam Sectoral Phase-out Plan are calculated based on the guidance provided by the various EC Decisions and precedents and agreements reached with MLF during recently approved projects in this Sector from India. The total costs worked out are as below:

Incremental Capital Costs:	US\$ 4,440,000
Contingencies:	US\$ 414,000
Incremental Operating Costs:	US\$ 570,577
<b>Total:</b>	<b>US\$ 5,424,577</b>

The basis and detailed calculations for the various cost elements are presented in Annex-7 to Annex-9.

## 7. COST EFFECTIVENESS

The Cost Effectiveness (ratio of the total incremental costs to the net ODP phased out per year post-project) of this project works out to US\$ 8.88/kg/y. This has been calculated from the net incremental project costs of US\$ 5,424,577 and the net CFCs (reflecting the net ODP value) of 611.12 MT, to be phased out upon completion. Detailed calculations are provided in Annex-9.

## 8. FINANCING

The total requested grant funding is US\$ 5,424,577.

## 9. IMPLEMENTATION

### 9.1 Performance and Disbursement Schedule

Year	ODS phase-out target (MT)			Remaining ODS Consumption (MT)	Disbursement (US\$)
	From approved ongoing projects	From Sectoral Phase-out Plan	Total		
2002	221	0	221	1,655	1,500,000
2003	397	0	397	1,434	1,750,000
2004	298	210	508	1,037	1,500,000
2005	100	301	401	529	450,000
2006	0	128	128	128	224,577
<b>TOTAL</b>	<b>1,016</b>	<b>639</b>	<b>1,655</b>	<b>1,655</b>	<b>5,424,577</b>

#### Notes:

- The first disbursement of US\$ 1,500,000 is due upon Plan approval (assumed by July 2002).
- The annual performance progress report for each year will be due for submission in the first quarter of the following year.
- The disbursement for each year shall be made in advance, due in the first quarter, upon receipt and acceptance of the annual performance progress report for the preceding year and implementation plan for the current year.



## 9.2 Management

The overall management of the Plan will be carried out as described in Section 4.3 by Government of India and the actual implementation and execution will be arranged by UNDP.

## 10. RESULTS

This project will eliminate the use of CFCs in the Foam Sector in India

### ANNEXES

- Annex-1: List of Approved Investment Projects in the Foam Sector in India
- Annex-2: List of Remaining Eligible Enterprises in the Foam Sector in India
- Annex-3: List of Remaining Non-eligible Enterprises in the Foam Sector in India
- Annex-4: List of Remaining Enterprises in other Foam Sub-sectors not consuming CFCs
- Annex-5: List of Upstream Suppliers
- Annex-6: Format of Letter of Participation and Commitment from Enterprises
- Annex-7: Incremental Capital Costs
- Annex-8: Incremental Operating Costs
- Annex-9: Cost-effectiveness Calculations
- Annex-10: Environmental Assessment
- Annex-11: Agreement between India and the Executive Committee
- Annex-12: Technical Review

**ANNEX-1**  
**INDIA FOAM SECTOR: LIST OF APPROVED INVESTMENT PROJECTS (UNTIL MARCH 2002)**

Sr. No	Agency	Name	ODP	Grant (US\$)	CE
<b>A. Sub-Sector: Rigid Foam (General)</b>					
1	IBRD	Polynate Foams Pvt. Ltd. (under SPAP)	20.0	278,000	13.90
2	IBRD	Shree Precoated Steels Ltd. (under SPAP)	0.0	0	Canceled
3	IBRD	Blue Star Ltd. (under SPAP)	13.0	224,000	17.23
4	UNDP	Supertek International	10.6	83,202	7.85
5	UNDP	Standard Electric Appliances	10.0	78,136	7.81
6	UNDP	Sunpra Ltd.	20.0	414,000	20.70
7	IBRD	Industrial Foams Pvt. Ltd. (under SPAP)	35.0	320,000	9.14
8	IBRD	SDC Polyurethane Products Ltd.	24.0	160,971	6.71
9	UNDP	Inalsa Ltd.	28.9	123,000	4.26
10	UNDP	Omkar PUF Insulation	10.6	59,000	5.56
11	UNDP	Beardsell Ltd.	21.2	129,000	6.08
12	UNDP	Lloyd Insulations (India) Ltd.	76.7	500,000	6.52
13	IBRD	Polyproducts	18.5	140,190	7.58
14	UNDP	Deccan Engineering Enterprises	8.3	64,000	7.67
15	UNDP	Best Plastronics P. Ltd.	19.5	129,000	6.63
16	UNDP	Blowkings	17.6	132,000	7.51
17	UNDP	Delta Foams Engineering Co.	12.0	85,000	7.08
18	UNDP	Super Urethane Products P. Ltd.	39.1	284,000	7.26
19	UNDP	Viral Corporation	11.8	84,000	7.13
20	UNDP	Reliable Rotomoulders P. Ltd.	8.7	63,000	7.24
21	UNDP	Panna International	9.7	48,000	4.96
22	UNDP	Malanpur Entech P. Ltd.	18.9	148,000	7.83
23	UNDP	Ras Polybuild Products P. Ltd.	17.7	128,000	7.22
24	UNDP	Sintex Industries Ltd.	10.9	62,980	5.79
25	UNDP	Duab International	13.4	104,490	7.83
26	UNDP	Galaxy FRP P. Ltd.	18.5	144,808	7.83
27	UNDP	Nav Texfeb P. Ltd.	32.4	163,982	5.06
28	UNDP	Santech Industries	14.7	115,101	7.83
29	UNDP	Saddle Poly Products P. Ltd.	15.2	119,087	7.83
30	UNDP	Enertech Engineering P. Ltd.	15.8	123,109	7.81
31	UNDP	UNC Plast Industries	11.4	89,607	7.83
32	UNDP	Essa Aircons Ltd.	13.9	108,837	7.83
33	UNDP	Caryaire Equipments India P., Ltd.	17.0	133,509	7.83
34	UNDP	Lear Insulation Engineering P., Ltd.	10.6	82,567	7.82
35	UNDP	Nandadeep Fibrotech P., Ltd.	11.3	88,526	7.83
36	UNDP	Poly Glass Fibre Industries P., Ltd.	17.1	134,238	7.83
37	UNDP	Polyrub Industries	12.5	97,953	7.83
<b>TOTAL</b>			<b>667</b>	<b>5,243,293</b>	<b>7.86</b>

<b>B. Sub-Sector: Rigid Foam (SMEs)</b>					
1	UNDP	SME-I (30 enterprises)	290.0	1,404,000	4.84
2	UNDP	SME-II (28 enterprises)	105.7	699,139	6.61
3	UNDP	SME-III (24 enterprises)	97.7	777,198	7.95
4	UNDP	SME-IV (17 enterprises)	55.3	417,740	7.49
<b>TOTAL</b>			<b>549</b>	<b>3,298,077</b>	<b>6.01</b>

**Annex-1: Approved projects in the foam sector (cont'd)**

Sr. No	Agency	Name	ODP	Grant (US\$)	CE
<b>C. Sub-Sector: Rigid Foam (Thermoware)</b>					
1	IBRD	Milton Polyplas (India) Ltd. (under SPAP)	15.0	236,000	15.73
2	IBRD	Panorama Plastics (under SPAP)	8.0	120,950	15.12
3	IBRD	Vikram Plastics (under SPAP)	15.0	236,000	15.73
4	UNDP	Varivar Plast Products P., Ltd.	12.3	96,184	7.82
5	UNDP	O.K. Industries	10.7	66,227	6.19
6	UNDP	Eagle Flasks Industries Ltd.	20.0	365,000	18.25
7	IBRD	Ishwar Arts (under SPAP)	8.0	120,950	15.12
8	IBRD	Ishwar Ashish Plastics P. Ltd. (under SPAP)	8.0	120,950	15.12
9	IBRD	Milton Plastics Ltd. (under SPAP)	30.0	456,500	15.22
10	UNDP	Bharat Plastic Products	25.0	96,000	3.84
11	UNDP	Mahavir Enterprises	19.4	94,500	4.87
12	UNDP	Asha Handicrafts (formerly Asian Advertisers)	19.4	122,500	6.31
13	IBRD	Arihant Thermoware Ltd.	0.0	0	Canceled
14	IBRD	Cello Plast	21.0	141,320	6.73
15	IBRD	Cello Thermoware Ltd.	17.4	129,420	7.44
16	IBRD	Wimco Pen Co.	18.5	119,290	6.45
17	UNDP	Amar Enterprises	16.2	120,000	7.42
18	UNDP	Bharat Plast	10.6	71,000	6.69
19	UNDP	Bharat Cottage Industries	7.8	61,000	7.78
20	UNDP	Nissan Thermoware P. Ltd.	15.4	111,000	7.21
21	UNDP	Bluplast Corporation	10.1	76,000	7.51
22	UNDP	Alaska Industries	17.6	128,000	7.29
23	UNDP	Jaypee Technoplast P. Ltd.	18.5	139,860	7.56
24	UNDP	National Flask Industries Ltd.	36.9	203,870	5.52
25	UNDP	Jayson Industries	12.9	88,900	6.89
26	UNDP	Ajay Corrugating and Plastics P. Ltd.	10.3	80,805	7.83
27	UNDP	Ganga Thermoware	10.1	78,864	7.81
28	UNDP	Bansal Plastic Industries	20.4	68,829	3.37
29	UNDP	Shree Nath Plastics	13.9	61,370	4.42
30	UNDP	Devisons P. Ltd.	15.3	114,940	7.54
31	UNDP	N.D. Plastics	12.9	101,289	7.85
32	UNDP	Ashoka Metals	12.5	68,066	5.45
33	UNDP	Tokyo Plast International, Ltd.	30.5	196,394	6.44
34	UNDP	Mayur Jugs P., Ltd.	16.9	119,412	7.07
35	UNDP	Crystal Electronics and Plastics	18.3	123,343	6.74
36	UNDP	National Plastics	36.2	212,481	5.88
37	UNDP	Ramakrishna Moulders	15.7	78,479	4.99
38	UNDP	M-Plast	13.0	93,279	7.15
39	UNDP	Naorang Plast	13.5	53,171	3.94
40	UNDP	Sanjay Industries	15.7	99,277	6.32
41	UNDP	Crown Industries	22.5	113,110	5.02
42	UNDP	Evershine Plastic Industry	16.2	80,060	4.95
43	UNDP	Roome Plastics P., Ltd.	18.1	100,546	5.56
44	UNDP	Apollo Steelcrafts	13.7	76,925	5.63
45	UNDP	SR Polymers and Printers	19.6	95,002	4.83
46	UNDP	Prince Plastoware Ltd.	9.4	74,010	7.87
47	UNDP	Solvay Moulding P., Ltd.	26.1	196,885	7.55
48	UNDP	Bhatia Plastics	11.1	87,070	7.83
<b>TOTAL</b>			<b>786</b>	<b>5,895,028</b>	<b>7.50</b>

**Annex-1: Approved projects in the foam sector (cont'd)**

Sr. No	Agency	Name	ODP	Grant (US\$)	CE
<b>D. Sub-Sector: Flexible Molded/Integral Skin Foam</b>					
1	IBRD	Tranquil Rubber Sales Pvt. Ltd. (under SPAP)	17.0	215,250	12.66
2	IBRD	Vijayjyot Seats Ltd.	49.0	335,500	6.85
3	IBRD	Polyflex (India) P. Ltd.	40.0	222,400	5.56
4	IBRD	Alfa Foams (under SPAP)	19.0	219,900	11.57
5	UNDP	Primrose Multiplast P. Ltd.	9.6	117,105	12.20
6	IBRD	Kurlon (under SPAP)	27.0	253,200	9.38
7	IBRD	Madras Polymoulds (under SPAP)	10.0	167,700	16.77
8	IBRD	Pfeda Synthetics (P) Ltd.	30.0	335,728	11.19
9	IBRD	Bharat Seats Ltd.	55.0	514,563	9.36
10	IBRD	PUR Polyurethane Products P. Ltd.	17.0	187,864	11.05
11	UNDP	Autofit P., Ltd.	0.0	0	Canceled
12	UNDP	Kaygee Foams P., Ltd.	33.0	217,250	6.58
13	UNDP	Preto Foams	11.5	167,100	14.53
14	IBRD	Roloforms Polymer Ltd.	26.0	162,400	6.25
15	UNDP	Amit Polyseats Ltd.	19.3	243,000	12.59
16	UNDP	Meenakshi Polymers Pvt. Ltd.	15.0	214,000	14.27
17	UNDP	Punjab Scooters Ltd.	39.0	312,200	8.01
18	UNDP	Krishna Fabrications Ltd.	13.0	164,000	12.62
19	UNDP	K.B. Poly Industries P. Ltd.	10.0	149,000	14.90
20	UNDP	Venus Auto P. Ltd.	21.0	137,250	6.54
21	UNDP	Siddhi Polymer P. Ltd.	7.5	75,250	10.03
22	UNDP	Shri Krishna Polyurethane Industries P. Ltd.	19.2	192,875	10.07
23	UNDP	Legend Interiors	9.0	124,000	13.73
24	UNDP	K. J. Polymers P. Ltd.	30.0	127,550	4.25
25	UNDP	Coolwels Automobile Engineers	15.8	133,221	8.46
26	UNDP	Premium Mouldings and Pressings P., Ltd.	17.7	138,432	7.82
27	UNDP	Reactive Polymers Ltd.	29.6	298,905	10.10
28	UNDP	Jaiswal Industries	13.1	152,070	11.64
29	UNDP	Delite Foam and Polymers	11.2	188,832	16.86
30	UNDP	Harjas Plastic and Metal Components P. Ltd.	20.2	246,386	12.20
31	UNDP	Raipur Agencies	16.3	144,567	8.87
32	UNDP	Pyarelal Coir Products Ltd.	18.5	167,381	9.07
33	UNDP	R.H. Industries	11.3	153,895	13.68
34	UNDP	Pinnacle Industries Ltd.	13.0	186,392	14.34
35	UNDP	Nindra Foams	11.0	148,804	13.53
36	UNDP	SR Poly-steel P. Ltd.	14.9	144,299	9.72
37	UNDP	Enkay Foam P., Ltd.	16.6	162,339	9.78
38	UNDP	Alka International Ltd.	18.5	173,155	9.36
39	UNDP	Netplast Ltd.	18.0	177,224	9.85
40	UNDP	Sun Steering Wheels. Ltd.	15.6	144,379	9.26
41	UNDP	Sawhney Seating Systems	27.9	241,619	13.73
42	Italy	Oto Industries P., Ltd.	12.7	139,716	11.00
43	UNDP	Viking Engineers P. Ltd.	13.3	144,900	10.94
44	Italy	Flexo Foam P., Ltd.	19.4	185,241	9.55
45	Italy	Sutlej Coach Products P., Ltd.	18.0	187,400	10.41
46	Italy	Maivika Polymers	20.0	196,510	9.83
47	UNDP	Nu-Foam Rubber Industries P., Ltd.	15.6	160,150	10.23
48	Germany	Pramukh Poly Products	27.0	224,812	8.33
49	Germany	Precision Engineering Tools & Components	22.0	200,282	9.31
<b>TOTAL</b>			<b>964</b>	<b>9,296,096</b>	<b>9.64</b>

**Annex-I: Approved projects in the foam sector (cont'd)**

Sr. No	Agency	Name	ODP	Grant (US\$)	CE
<b>E. Sub-Sector: Rigid Foam (Spray/Insitu)</b>					
1	UNDP	Puff Insulators	10.6	83,150	7.83
2	UNDP	P.K. Construction Co.	10.6	74,172	7.00
3	UNDP	Baba Insulator	14.4	59,096	4.11
4	UNDP	R.S. Insulators	10.3	54,800	5.32
5	UNDP	Spray Group - I	211.1	1,094,567	5.19
6	UNDP	Spray Group - II	178.4	759,165	4.26
<b>TOTAL</b>			<b>435</b>	<b>2,124,950</b>	<b>4.88</b>

<b>G. Sub-Sector: Flexible Slab-stock Foam</b>					
1	IBRD	Duroflex Coir Industries P. Ltd. (under SPAP)	10.0	100,800	10.08
<b>TOTAL</b>			<b>10</b>	<b>100,800</b>	<b>10.08</b>

<b>G. Sub-Sector: EPE/EPS Foam</b>					
1	UNDP	Camphor and Allied Products Ltd.	120.0	280,000	2.33
2	IBRD	Real Polymers	35.0	276,200	7.89
3	IBRD	Kunststoff Polymers Ltd.	0.0	0	Canceled
4	IBRD	Shroff Textiles Ltd.	25.0	197,200	7.89
5	UNDP	Vora Cork Industries	39.6	264,500	6.68
<b>TOTAL</b>			<b>220</b>	<b>1,017,900</b>	<b>4.64</b>

<b>H. Sub-Sector: Phenolic Foam</b>					
1	UNDP	Bakelite Hylam Ltd.	58.0	367,000	6.33
<b>TOTAL</b>			<b>58</b>	<b>367,000</b>	<b>6.33</b>

<b>I. Sub-Sector: Polyol Production/System House</b>					
1	IBRD	UB Petroproducts Ltd.	0.0	200,000	NA
2	IBRD	Manali Petrochemicals Ltd.	0.0	219,000	NA
3	IBRD	Expanded Incorporation	0.0	502,130	NA
4	UNDP	Polymermann (Asia) P.Ltd.	0.0	385,000	NA
5	UNDP	Shivathene Linopack	0.0	209,000	NA
<b>TOTAL</b>			<b>0</b>	<b>1,515,130</b>	<b>NA</b>

<b>J. Sub-Sector: Multiple</b>					
1	UNDP	U-Foam P. Ltd.	35.0	328,500	9.39
2	UNDP	Joti Foam Products P. Ltd.	37.6	174,290	4.64
<b>TOTAL</b>			<b>73</b>	<b>502,790</b>	<b>6.93</b>

<b>GRAND TOTAL (158 Investment Projects)</b>			<b>3,762</b>	<b>29,361,064</b>	<b>7.81</b>
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**ANNEX-2**  
**INDIA – FOAM SECTOR: LIST OF REMAINING ELIGIBLE ENTERPRISES**

**Table 2.1: Rigid foam (general insulation) sub-sector**

No	Enterprise name	Location	Year established	Products	CFC Consumption (MT)	Baseline equipment
1	Aakriti Ice Box Co.	Delhi	1989	Insulated boxes	12.1	1 LPD – Local
2	HR Innovations	Mumbai	1991	Insulated doors	9.7	1 LPD – Polycraft
3	Kakar Trading Co.	Delhi	1987	Slabs, pipe/sect	11.0	1 LPD – Local
4	Patton Tanks	Calcutta	1982	Insulated tanks	7.8	1 LPD – Klowpur
5	Suchi Foams	Ahmedabad	1994	Panels	16.1	1 LPD – Klowpur
<b>TOTAL</b>					<b>56.7</b>	<b>5 LPDs</b>

**Table 2.2: Rigid foam (thermoware insulation) sub-sector**

No	Enterprise name	Location	Year established	Products	CFC Consumption (MT)	Baseline equipment
1	Aakar Industries	Noida	1991	Thermoware	11.3	1 LPD – Local
2	Anmol Plast	Delhi	1991	Thermoware	10.6	1 LPD – Local
3	Atul Marketing	Delhi	1992	Thermoware	6.5	1 LPD – Local
4	Balaji Plastics	Delhi	1987	Thermoware	8.0	1 LPD – Local
5	CL Plastics	Delhi	1988	Thermoware	11.0	1 LPD – Local
6	Indus Plast	Sahranpur	1990	Thermoware	9.8	1 LPD – Local
7	Jupiter Engineering	Vapi	1991	Thermoware	9.5	1 LPD – Cannon
8	Mukesh Plastic Engineering	Delhi	1984	Thermoware	8.5	1 LPD – Local
9	Neelam Plastic Industries	Mumbai	1973	Thermoware	9.6	1 LPD – Local
10	Payal Products	Delhi	1987	Thermoware	9.2	1 LPD – Local
11	Pradeep Polymers	Delhi	1993	Thermoware	10.7	1 LPD – Local
12	Thermoplast Industries	Mumbai	1995	Thermoware	11.8	1 LPD – Local
<b>TOTAL</b>					<b>116.5</b>	<b>12 LPDs</b>

**Table 2.3: Rigid foam (spray/insitu insulation) sub-sector**

No	Enterprise name	Location	Year established	Products	CFC Consumption (MT)	Baseline equipment
1	Alpha Insulation	Ahmedabad	1991	Spray/Insitu	6.5	1 HPD – Polycraf
2	Amijit Enterprises	Mumbai	1994	Spray/Insitu	5.8	1 HPD – Polycraft
3	Bright Insulations	Delhi	1979	Spray/Insitu	7.6	1 HPD – Polycraft
4	Enecon Engineers	Mumbai	1987	Spray/Insitu	7.5	1 HPD – Polycraft
5	Insulations India	Vapi	1988	Spray/Insitu	9.5	1 HPD – Gusmer
6	Insultech Enterprises	Yamunangr	1989	Spray/Insitu	6.5	1 HPD – Polycraft
7	Jaya Enterprises	Mumbai	1995	Spray/Insitu	8.4	1 HPD – Gusmer
8	Kwality Insulations	Deihi	1990	Spray/Insitu	8.5	1 HPD – Polycraft
9	Narmada Insulations	Deihi	1993	Spray/Insitu	10.5	1 HPD – Polycraft
10	Om Insulations	Mumbai	1995	Spray/Insitu	8.0	1 HPD – Gusmer
11	Pravin Enterprises	Vadodara	1991	Spray/Insitu	8.5	1 HPD – Polycraft
12	Professional Insulations	Gurgaon	1990	Spray/Insitu	10.8	3 HPD – Gusmer
13	ISD Polyurethane Enterp	Ghaziabad	1987	Spray/Insitu	6.5	1 HPD – Polycraft
14	Wico	Vadodara	1993	Spray/Insitu	9.5	1 LPD – Klowpur
<b>TOTAL</b>					<b>114.2</b>	<b>15 HPDs, 1 LPD</b>

**ANNEX-2 (Cont'd)**
**India – Foam Sector: List of Remaining Eligible Enterprises**
**Table 2.4: Rigid foam (SMEs) sub-sector**

No	Enterprise name	Location	Year established	Products	CFC Consumption (MT)	Baseline equipment
1	Advance FRP	Mumbai	1983	RPUF General	2.5	Hand mixing
2	AG Insulators	Noida	1994	RPUF General	2.1	Hand mixing
3	Arci Engineers	Mumbai	1985	RPUF General	2.4	Hand mixing
4	Babylon Plast	Mumbai	1995	Thermoware	2.4	Hand mixing
5	Beegee Enterprises	Dadanagar	1993	Thermoware	1.9	Hand mixing
6	Bhagwati Plastics	Delhi	1993	Thermoware	2.3	Hand mixing
7	Bharat Traders	Mumbai	1992	RPUF General	2.5	Hand mixing
8	Bhoopatya Associates	Chennai	1986	RPUF General	2.5	Hand mixing
9	Chemisol Industries	Vapi	1991	RPUF General	2.0	Hand mixing
10	Citizen Industries	Ahmedabad	1991	Thermoware	2.2	Hand mixing
11	Craftway Engineers	Mumbai	1990	Thermoware	2.4	Hand mixing
12	Eaphael Industries	Delhi	1981	Thermoware	2.6	Hand mixing
13	Emcee	Ludhiana	1981	RPUF General	2.0	Hand mixing
14	Ethos Systems	Ahmedabad	1995	RPUF General	2.2	Hand mixing
15	Gautam Industries	Delhi	1991	Thermoware	2.0	Hand mixing
16	Gem Ply Systems	Mumbai	1993	RPUF General	2.9	Hand mixing
17	HPN Industries	Bangalore	1991	RPUF General	2.0	Hand mixing
18	Jain Plast	Mumbai	1994	Thermoware	2.4	Hand mixing
19	Jay Vee Cee Corporation	Mumbai	1995	RPUF General	2.5	Hand mixing
20	Jonex Rubber Industries	Jalandhar	1989	RPUF General	2.0	Hand mixing
21	Malabar Thermoware	Bangalore	1994	Thermoware	3.0	Hand mixing
22	Mayur Extrusions	Sarigam	1992	Thermoware	3.0	Hand mixing
23	Modern Flask	Mumbai	1990	Thermoware	2.4	Hand mixing
24	Nissan Doors	Mumbai	1985	RPUF General	2.2	Hand mixing
25	Palmline Plastics	Mumbai	1994	Thermoware	2.5	Hand mixing
26	Pawan Procast	Mumbai	1995	RPUF General	1.8	Hand mixing
27	Polyfoam Industries	Mumbai	1995	RPUF General	1.8	Hand mixing
28	Ram Enterprises	Bangalore	1994	RPUF General	2.2	Hand mixing
29	Reliance Engineers	Mumbai	1987	RPUF General	2.4	Hand mixing
30	Sanjay Metals	Mumbai	1994	Thermoware	2.2	Hand mixing
31	Sharda Construction	Mumbai	1994	RPUF General	2.5	Hand mixing
32	Sharp Industries	Mumbai	1989	RPUF General	2.5	Hand mixing
33	Sheth Fabricators	Mumbai	1992	RPUF General	2.8	Hand mixing
34	Shreya Insulations	Bilimora	1990	RPUF General	2.7	Hand mixing
35	SM Polymers	Faridabad	1994	RPUF General	2.0	Hand mixing
36	Spark Allied Industries	Bangalore	1992	RPUF General	2.2	Hand mixing
37	SS Enterprises	Mumbai	1995	Thermoware	1.7	Hand mixing
38	Sri Venkateshwara Ind	Bangalore	1995	RPUF General	2.0	Hand mixing
39	Toshbro Industries	Daman	1994	RPUF General	2.7	Hand mixing
40	Tristar	Mumbai	1994	RPUF General	2.5	Hand mixing
<b>TOTAL</b>					<b>94.1</b>	<b>No Foam Dispensers</b>

**ANNEX-2 (Cont'd)**

**India - Foam Sector: List of Remaining Eligible Enterprises**

**Table 2.5: Flexible Molded/Integral Skin foam sub-sector**

No	Enterprise name	Location	Year established	Products	CFC Consumption (MT)	Baseline equipment
1	ABH Industries	Valsad	1994	FMF	4.5	1 LPD - Local
2	APL Corporation	Chennai	1994	FMF/ISF	7.5	2 LPD - Cannon/SAIP
3	AS Polymers	Ambala	1994	FMF	6.0	1 LPD - Local
4	Bhutani Industries	Gurgaon	1994	FMF	10.5	1 LPD - Cannon
5	Crypton Industries	Calcutta	1991	FMF/ISF	7.5	1 HPD - Hennecke
6	Durotex Polymers	Coimbatore	1993	FMF	4.8	1 LPD - Local
7	Foam India	Tiruchirapali	1994	FMF	9.5	1 LPD - Local
8	Foam Products	Bangalore	1984	FMF	5.4	1 LPD - Local
9	Gopsy Rubber Industries	Mumbai	1990	FMF	4.8	1 LPD - Local
10	Indrayani Udyog	Nagpur	1994	FMF	12.5	1 LPD - Local
11	Jindal Petrofoams	Ambala	1994	FMF	4.5	1 LPD - Local
12	Joginder Singh	Ludhiana	1965	FMF	6.0	1 LPD - Local
13	Koyas Polymers	Coimbatore	1971	FMF	11.0	1 LPD - Elastogran
14	Kvik Thermofoam	Mumbai	1990	FMF	8.3	1 LPD - Local
15	Lux Autofoam	Coimbatore	1994	FMF	6.6	1 LPD - Local
16	National Polymers	Mumbai	1992	FMF	4.0	1 LPD - Local
17	Omega Lining	Coimbatore	1992	FMF	13.5	1 LPD - Local
18	Poly Crafts	Delhi	1987	FMF	10.4	1 LPD - Hennecke
19	Premier Industries	Medak	1995	FMF	14.1	1 LPD/Local, 1 HPD Henn
20	Pyarelal Foams	Meerut	1994	FMF	12.0	1 LPD - Local
21	Sigma Industries	Delhi	1993	FMF/ISF	13.6	1 LPD - KWI
22	Siddhi Vinayak Polymers	Jalandhar	1994	FMF	12.4	2 LPD - OMS/Indipuf
23	Sunpreet Engineers	Chennai	1995	FMF	4.8	1 LPD - Local
24	Surbhi Polymers	Delhi	1993	FMF	9.7	1 LPD - Local
25	Transval Manufacturing	Chennai	1994	FMF	4.8	1 LPD - Local
26	Urethane Specialties	Hyderabad	1993	FMF	9.0	1 LPD - OMS
27	Vam Polyplast	Hyderabad	1989	FMF	8.0	1 LPD - Graco
28	Vicktra Polyfoams	Chennai	1995	FMF	4.6	1 LPD - Local
<b>TOTAL</b>					<b>230.3</b>	<b>28 LPDs, 2 HPDs</b>

- NOTES: 1. All enterprises mentioned as established in 1995 in Tables 2.1 to 2.5, commenced operations prior to July 1995.  
2. It has been ensured that there has been no double counting of enterprises.

**Table 2.6: Summary**

Sub-sector	Number of Enterprises	CFC Consumption (MT)
Rigid foam (general insulation)	5	56.7
Rigid foam (thermoware)	12	116.5
Rigid foam (spray/insitu)	14	114.2
Rigid foam (SMEs)	40	94.1
Flexible molded & integral skin foam	28	230.3
<b>TOTAL</b>	<b>99</b>	<b>611.8</b>



**ANNEX-3**  
**INDIA – FOAM SECTOR: LIST OF REMAINING NON-ELIGIBLE ENTERPRISES**

No	Enterprise name	Location	Year established	Products	CFC Consumption (MT)	Baseline equipment
1	Akash Thermowares	Delhi	2000	RPUF – Thermo	0.8	Hand mixing
2	Arynit Industries	Baddhi	1998	FMF	2.6	1 LPD – Local
3	Asian Thermal Insulation	Delhi	1998	RPUF – Gen	0.7	1 LPD – Local
4	Bansal Technocrafts	Sahranpur	2000	RPUF – Thermo	0.9	Hand mixing
5	Bristol Steel Industries	Fazilka	1999	RPUF – Thermo	1.3	Hand mixing
6	DC Plastics	Delhi	2000	RPUF – Thermo	0.6	Hand mixing
7	Fixopan Engineering	Delhi	1998	RPUF – Gen	0.6	Hand mixing
8	Gopal Insulators	Delhi	1999	Spray/Insitu	1.5	1 HPD – Polycraft
9	Hammer Master	Faridabad	2000	RPUF – Thermo	1.8	Hand mixing
10	Jagson Plastics	Delhi	1999	RPUF – Thermo	0.9	Hand mixing
11	Jeet Plastics	Bhiwadi	1999	RPUF – Thermo	1.2	Hand mixing
12	JK Industries	Delhi	1998	RPUF – Thermo	1.1	Hand mixing
13	Libra Plastics	Chennai	1999	FMF	1.0	1 LPD – Local
14	Madhu Plastics	Delhi	2000	RPUF – Thermo	1.0	Hand mixing
15	Marvel Hi-Tech	Ahmedabad	1998	RPUF – Gen	1.1	Hand mixing
16	Mili Thermoware	Delhi	1999	RPUF – Thermo	0.6	Hand mixing
17	MZ Plastics	Delhi	1999	RPUF – Thermo	0.8	Hand mixing
18	National Thermoware	Delhi	1998	RPUF – Thermo	0.6	Hand mixing
19	Plastopan Engineering	Mumbai	1997	RPUF – Gen	1.2	Hand mixing
20	Plaza Thermoware	Delhi	2000	RPUF – Thermo	0.7	Hand mixing
21	Puftech Industries	Delhi	1998	RPUF – Gen	0.9	Hand mixing
22	Rajesh Industries	Delhi	2000	RPUF – Thermo	0.9	Hand mixing
23	Sejpal & Co	Mumbai	2000	RPUF – Gen	1.1	1 LPD - Local
24	Shakir Plastics	Delhi	1999	RPUF – Thermo	0.6	Hand mixing
25	Venus Foam	Delhi	1999	FMF	1.2	1 LPD – Local
26	Vinit Plastics	Delhi	1999	RPUF – Thermo	0.7	Hand mixing
27	VK Sales Corporation	Delhi	2000	RPUF – Thermo	0.9	Hand mixing
<b>TOTAL</b>					<b>27.3</b>	<b>5 LPDs, 1 HPD</b>

**ANNEX-4**  
**INDIA – FOAM SECTOR: LIST OF ENTERPRISES IN OTHER FOAM SUB-SECTORS**

**Table 4.1: Flexible (box) foam**

No	Enterprise Name	Location
1	Aagosh Polyfoams	Bareilly
2	Adhinath Foam	Jalandhar
3	Aditi Foam	Mathura
4	Amar Foam	Muzzafarnagar
5	Anand Polyurethane	Jammu
6	Anant Udyog	Mumbai
7	Arhant Sueds	Sahibabad
8	Arihant Foam	Derabassi
9	Aromatic Agencies	Mumbai
10	Arora Foam	Rajpura
11	Arvind International	Jaipur
12	Ashoka PU Foams India	Bareilly
13	Chandigarh Petrofoams	Mohali
14	Clariant India	Mumbai
15	Coromandal Foam	Chennai
16	Dev Foam	Nalagarh
17	Dharsana Foams	Mumbai
18	Diana Foams	Jamshedpur
19	DP Foams	Pondicherry
20	Dura Foam Industries	Mumbai
21	Dyna Foam	Orrisa
22	FeatherFoam Enterprises	Sahibabad
23	Flexipol Foams	Bhiwadi
24	Foam Home (India)	Mumbai
25	JK Foam	Meerut
26	Jai Industries	Hydrabad
27	Jayashree Polycasts	Mumbai
28	Jayantilal J Gandhi Corp	Mumbai
29	Jindal Petrofoams	Ambala
30	Joy Foams	Chennai
31	Kay Foam	Mumbai
32	Kozymat Foam	Banmore
33	Kromatik	Chennai
34	Libra Foam	Chennai
35	M.H Polymers	Delhi
36	Maedo Foam	Bangalore
37	Marvel Foams	Ahmedabad
38	Mehta Enterprises	Mumbai
39	MM Foam	Chennai
40	Modern Foam Udyog	Ludhiana
41	Monarch	Bangalore
42	Multiwyn Foams	Calcutta
43	Om Foamers	Ludhiana
44	Orient Inter Trade	New Delhi
45	PU Foam Industries	Calcutta

**ANNEX-4: India – Foam Sector: List of Enterprises in other Foam Sub-sectors (Cont'd)**

**Table 4.1: Flexible polyurethane (box) foam (Cont'd)**

No	Enterprise Name	Location
46	PUF Foam	Bhiwadi
47	Purty Foam	Derabassi
48	RS Foam	Ludhiana
49	Raj Foam	Sonepat
50	Raman Foam	Gorakhpur
51	RDI Foams	Faridabad
52	Rinac India	Bangalore
53	SS Foam	Patiala
54	SV Polymers	Jalandhar
55	Sandeep Foam	Sahibabad
56	Shankar Foam	Sonepat
57	Shanti Petrofoams	Sonepat
58	Shivam Petrofoams	Khanna
59	Shri Singhanian Foam	Patna
60	Shroff Foam	Calcutta
61	Sietz Technologies India	Faridabad
62	Sikka Foam	Jalandhar
63	Sujata Polyfoams	Belgaum
64	Swiss Foam	Ahmedabad
65	TRK Foam	Palakkad
66	Tirupati Foam	Ahmedabad
67	United Co.	Mumbai
68	Unity Engineers	Vadodara
69	Victory Polyfoams	Ludhiana

**Table 4.2: Polyurethane shoe soles**

No	Enterprise Name	Location
1	Action Shoes	Delhi
2	Alert India	Delhi
3	Anaka India	Delhi
4	ARO Shoes	Karnal
5	Bata Shoe Co	Calcutta
6	Duper Shoe Industries	Delhi
7	Gulshan International	Delhi
8	HKWS Shoes	Delhi
9	Jumbo Polymers	Hyderabad
10	Kurtojohn	Noida
11	Lakhani Shoes	Faridabad
12	Liberty Footwear	Karnal
13	Mescat	Mumbai
14	Metro Shoes	Mumbai
15	Oriental Shoe Co.	Mawana
16	Raghu Shoes	Agra
17	Rex Shoes	Mumbai
18	SR Universal	Delhi
19	Unisol	Delhi

**ANNEX-4 (Cont'd)****India – Foam Sector: List of Enterprises in other Foam Sub-sectors****Table 4.3: Polyurethane elastomers**

No	Enterprise Name	Location
1	Atul Products	Valsad
2	International Combustion	Nagpur
3	International Product Manufacturing	Pune
4	ITW Signode	Hyderabad
5	Kemefs Value Additives	Mumbai
6	Moon Polymers	Ahmedabad
7	Nagaista	Mumbai
8	Nishhuba	Mumbai
9	Nylacasi	Mumbai
10	Plascon Polymers	Kanpur
11	Satyanarayan Enterprises	Hyderabad
12	Shreeram Polyplast	Chennai
13	Speciality Polyurethanes	Satara
13	Swagat Polyurethane	Hyderabad
14	Rexello Rubber	Mumbai
15	Tega India	Calcutta
16	Texwico	Ahmedabad
17	United Ink and Varnish	Mumbai
18	Urethane Systems and Solutions	Delhi
19	VCM Polyurethanes	Mumbai

**ANNEX-5**  
**INDIA – FOAM SECTOR: LIST OF UPSTREAM SUPPLIERS**

**Table 5.1: Polyurethane Chemical Producers/System Houses**

No	Enterprise name	Location	Year established	Products manufactured	Applications
1	Expanded Inc.	Mumbai	1982	Polyether/Polyester polyols	RPUF
2	Gujarat Narmada	Coimbatore	1987	Polyols, TDI	FPUF Slab-stock
3	Hindustan Organic Chemicals*	Bareilly	1995	Polyether/Polyester polyols	FMF/ISF, RPUF
4	Huntsman (ICI) India	Mumbai	NA	System house	All
5	Industrial Foams P. Ltd.	Delhi	1983	System house	RPUF
6	Organometallic Industries Ltd.	Mumbai	1989	System house	RPUF
7	Paradigm Polyplast P. Ltd.	Daman	1991	System house	RPUF
8	Pine Resins and Chemicals	Mumbai	1992	System house	RPUF
9	Polymermann Asia P. Ltd.	Mumbai	1984	Polyether/Polyester polyols	RPUF
10	Shivathene Linopack	Parwanoo	1989	Polyether/Polyester polyols	RPUF
11	Sinnar Ureplas P. Ltd.	Sinnar	1988	System house	RPUF
12	SPIC Organics Ltd.**	Chennai	1983	Polyether/Polyester Polyols	All
13	Tandy Innovative Chemicals Ltd.	Mumbai	1992	System house	RPUF

\* As on date, has not produced either polyols or MDI, which they had planned to. Presently only sells formulated systems.

\*\* This group acquired Manali Petrochemicals Ltd., which in turn had earlier acquired UB Petroproducts Ltd.

**Table 5.2: Polyurethane Foam Equipment**

No	Enterprise name	Location	Year established	Products
1	Excel Engineers	Ghaziabad	1994	LPD
2	Indipuf	Nabha	1990	LPD
3	Klockner-Windsor India*	Delhi	1986	LPD*
4	Nova Pumech	Vadodara	1988	LPD*
5	Polycraft	Vadodara	1989	LPD, HPD (for spray/insitu)
6	Polymermann Asia	Mumbai	1984	LPD, molds, jigs, fixtures
7	Rank & Co.	Mumbai	1991	LPD
8	Santech Industries	Mohali	1994	LPD
9	Shanbhag Associates	Mumbai	1993	LPD
10	Shyam Machine Tools	Delhi	1992	LPD
11	Trinity Engineers	Mumbai	1990	LPD
12	Twin Engineers	Pune	1985	LPD

\* The division manufacturing LPDs is no longer in operation.

**ANNEX-6**  
**FORMAT FOR LETTERS OF PARTICIPATION/COMMITMENT FROM**  
**ENTERPRISES TO BE COVERED UNDER THE FOAM SECTOR PHASE-OUT PLAN**

Ozone Cell  
Ministry of Environment & Forests  
New Delhi, India

Dear Sirs,

**Phase-out of CFCs in the manufacture of (sub-sector) foam**

In connection with the above we hereby confirm the following:

- 1)
  - a) We presently consume polyurethane chemicals in our production of (sub-sector) foam. 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, 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-7**  
**INCREMENTAL CAPITAL COSTS**

a) Investment Component

The following table summarizes the basis and considerations for calculating the incremental capital costs, for each remaining eligible unfunded participant enterprise in the Sectoral Phase-out Plan:

Sub-sector	Incremental Capital Costs (US\$)				No. of enterprises	Total (US\$)
	Equipment	Trials	Technical Assistance	Total		
RPUF (General)	60,000	2,000	See below	62,000	5	310,000
RPUF (Spray)	4,000	2,000	See below	6,000	14	84,000
RPUF (Thermoware)	42,000	2,000	See below	44,000	12	528,000
RPUF (SMEs)	20,000	2,000	See below	22,000	40	880,000
FMF/ISF	60,000	2,000	See below	62,000	28	1,736,000
System houses	40,000	2,000	See below	42,000	6	252,000
<b>TOTAL</b>					<b>105</b>	<b>3,790,000</b>

*Breakdown of Technical Assistance*

Input	Cost (US\$)
<b>International consultants</b> Avg. 4 man-days/enterprise X 65 enterprises = 260 man-days over 4 years Avg. 2 man-days/SME X 40 SMEs = 80 man-days over 4 years Total 340 man-days @ US\$ 500/man-day	170,000
<b>National consultants</b> Avg. 5 man-days/enterprise X 105 enterprises = 525 man-days over 4 years Total 525 man-days @ US\$ 200/man-day	105,000
Expenses (travel, office and miscellaneous reimbursed expenses) over 4 years (projected)	54,000
<b>Total for Technical Assistance (B)</b>	<b>350,000</b>

b) Policy & Management Support Component

Activity	Cost (US\$)
Management, coordination and monitoring (250 days/y x 4 y = 1,000 days) @US\$ 200 /day	200,000
Training and capacity-building activities for government/industry stakeholders and decision makers through workshops (1 workshop/year = 4 workshops)	40,000
Awareness programs (4 workshops + information dissemination)	40,000
Verification and certification (25 days/y x 4 y = 100 days) @US\$ 200/day	20,000
<b>Total</b>	<b>300,000</b>

**SUMMARY**

Activity	Cost (US\$)
Investment Component	4,140,000
Policy & Management Support Component	300,000
<b>TOTAL</b>	<b>4,440,000</b>

**ANNEX-8**  
**INCREMENTAL OPERATING COSTS**

**Basis and considerations**

1. The molded foam density increases in the rigid foam sub-sector with respect to CFC-11 based systems as calculated as recommended by OORG and adopted by EC Decision 31/35. In flexible molded and integral skin foam sub-sectors, no density increases are considered.
2. The net savings on account of more efficient handling of chemicals due to the introduction of a new high-pressure or medium-pressure foam dispensers are calculated at 5%. No savings are considered with retrofitted equipment.
3. The calculation of incremental operating costs is based on the following assumptions and chemical costs:

Rigid foam

- Cost of baseline CFC-based chemical system: US\$ 2.50/kg (Baseline ratio - 100:43:143)
- Cost of HCFC-141b based chemical system: US\$ 2.67/kg (New ratio - 100:26:145)

Flexible molded/ISF

- Cost of baseline CFC-based chemical system: US\$ 2.50/kg
- Cost of optimized water-based chemical system: US\$ 2.75/kg

4. All amounts rounded off to the nearest US\$ 1.00
5. The calculations exclude all taxes/duties and growth.
6. Based on foam project approvals in the last 1-2 years and the considerations and assumptions as above the average unit incremental operating costs for the various sub-sectors work out as tabulated below:

Sub-sector	Unit Incremental Operating Costs as NPV for 2 years at 10% annual discounting (US\$/kg per kg baseline CFC-11)
Rigid foam (General insulation)*	0.444
Rigid foam (SMEs)	0.444
Rigid foam (Spray/Insitu insulation)	0.801
Rigid foam (Thermoware insulation)	0.482
Flexible molded/IS foam	1.538

\* Assumes equal proportion of boards/slabs, panels and pipe-sections

**SUMMARY OF INCREMENTAL OPERATING COSTS**

Sub-sector	Baseline CFC (MT)	Incremental Operating Costs (US\$)
Rigid foam (General insulation)	56.7	25,185
Rigid foam (SMEs)	94.1	43,566
Rigid foam (Spray/Insitu insulation)	114.2	91,515
Rigid foam (Thermoware insulation)	116.5	56,092
Flexible molded/IS foam	230.3	354,219
<b>TOTAL</b>	<b>611.8</b>	<b>570,577</b>



**ANNEX-9**  
**COST-EFFECTIVENESS**

**A. ODP Impact of the Project**

SUBSTANCE	ODP	CONSUMPTION (KG)	NET ODP KG
CFC-11	1.00	639,100	639,100
Substitute: Water	0.00	230,300	0
Substitute: HCFC-141b	0.11	381,500	27,980
<b>Remaining ODP Consumption at the enterprise</b>			<b>27,980</b>

**B. Cost-effectiveness Calculation**

PARAMETER/COST HEAD	UNIT	TOTAL
<b>Total Project Costs</b>		
A. Incremental Capital Costs	US\$	4,440,000
B. Contingencies (10% of A)	US\$	414,000
C. Incremental Operating Costs	US\$	570,577
D. Total Project Costs (A + B + C)	US\$	5,424,577
<b>Adjustments to Project Costs</b>		
E. Adjustment for non-Article-5 ownership	US\$	0
F. Adjustment for export to non-Article-5 countries	US\$	0
G. Adjustment for technological upgrade	US\$	0
<b>Net Project Costs</b>		
H. Net Project costs (D - [E + F + G])	US\$	5,424,577
<b>ODS Phase-out</b>		
I. Total ODS phase-out	Kg	639,100
J. Net ODP phase-out	ODP Kg	611,120
<b>Cost-effectiveness</b>		
K. Cost-effectiveness of project (H/J)	US\$/kg/y	8.88
L. Cost-effectiveness threshold for sub-sector	US\$/kg/y	N/A
<b>MLF Funding</b>		
M. Eligible MLF Funding	US\$	5,424,577

**ANNEX-10**  
**ENVIRONMENTAL ASSESSMENT**

HCFC-141b has an ODP of 0.11 and GWP of 630, which are considered acceptable for rigid polyurethane foam application. HCFC-141b is considered non-flammable as a liquid and moderately flammable as a gas (7.6% to 17.7% in air by volume), and is considered safe in applications where the exposure level is less than 500 ppm on a 8-hour time weighted average basis, which is marginally lower than the existing technology. The smog potential of HCFC-141b is about ten times that of CFC-11, although with an emission rate of about 3% or less during production, this is not an issue. No changes in the current occupational safety practices are envisaged.

Fully water-based systems have no ODP, GWP or safety hazards. No changes in the current occupational safety practices are envisaged in this project.

This project thus uses environmentally safe and acceptable technologies.

The enterprises participating in this project have obtained the necessary statutory environmental clearances for their present operations. Additional clearances if any, for implementing this project, will be obtained as and when required from the relevant competent authorities.

**ANNEX-11**  
**AGREEMENT FOR PHASE-OUT OF CFCs IN THE FOAM SECTOR IN INDIA**  
 (Document UNEP/OzL.Pro/ExCom/37/71, Annex-VII)

1. The Executive Committee approves in principle a total of US\$ 5,424,577 in funding for the phased reduction and complete phase-out in of CFCs used in the Foam Sector in India. This is the total funding that would be available to India from the Multilateral Fund for the complete elimination of CFC use in the Foam Sector in India, by 31 December 2006. The agreed level of funding would be disbursed in installments as indicated in Table-1 and on the basis of the understanding set out in this agreement. By this agreement, India commits that it will eliminate its total CFC consumption in the Foam Sector in accordance with the phase-out target and CFC consumption limits as indicated in Table-1 below:

Table-1  
Disbursement Schedule and Control Targets for CFC Consumption  
and Phase-out in the Foam Sector in India

Parameter	2002	2003	2004	2005	2006	2007	Total
Annual CFC Consumption limit in the Foam Sector (ODP MT)	1,655	1,434	1,037	529	128	0	N/A
Annual CFC phase-out target in the Foam Sector (ODP MT)	221	397	508	401	128	0	1,231
Annual Funding Instalment* (US\$)	1,500,000	1,750,000	1,500,000	450,000	224,577	0	5,424,577
Agency Support Costs (US\$)	131,000	153,500	131,000	40,500	20,212	0	476,212
Total cost to Multilateral Fund (US\$)	1,631,000	1,903,500	1,631,000	490,500	244,789	0	5,900,789

\* Includes policy and management support costs of US\$ 100,000 for each of the years 2002 – 2004.

2. The phase-out of CFCs achieved in the Foam Sector in excess of the specified target for a given year will contribute to achievement of the phase-out targets in subsequent years.

3. The Executive Committee also agrees in principle that the funds for the implementation of the annual programme for any given year will be provided at the last meeting of the Executive Committee in the preceding year, in accordance with the disbursement schedule in Table-1, for the exact amount listed for that year and on the basis of the implementation programme for the year, subject to the performance requirements contained in this agreement. The Executive Committee will strive to ensure that funds are provided at its second meeting in the preceding year. The funding installments for 2003, 2004, 2005 and 2006 will be released subject to:

- a) The confirmation that all agreed phase-out targets and consumption limits for the previous year have been achieved;
- b) The verification that the activities planned for the previous year, were undertaken in accordance with the annual implementation programme.

4. The Government of India agrees to ensure accurate monitoring of the phase-out. The Government of India will provide regular reports, as required by its obligations under the Montreal Protocol and this Agreement. The consumption figures provided under this agreement will be consistent with India's reports to the Ozone Secretariat under Article 7 of the Montreal Protocol. The Government of India also agrees to allow independent verification audits as provided for in this agreement, and in addition, external evaluation as may be directed by the Executive Committee, to verify that annual CFC consumption levels correspond to those agreed and that the implementation of the Foam Sector Phase-out Plan proceeds as scheduled and agreed in annual implementation programmes.

5. The Executive Committee agrees to provide India with flexibility in using the agreed funds to meet the consumption limits indicated in Table-1. The Executive Committee has the understanding that during implementation, as long as it is consistent with this Agreement, the funds provided to India pursuant to this Agreement may be used in the manner that India considers will achieve the smoothest possible CFC phase-out, consistent with operational procedures as agreed between India and UNDP in the Foam Sector Phase-out Plan as revised and as indicated in the annual implementation programmes. In the Executive Committee's acknowledgement of the flexibility available to India in achieving a complete CFC phase-out in the Foam Sector, it is understood that India is committing to provide the necessary level of resources as may be required for the implementation of the plan and for achieving the consumption limits indicated in Table-1 above.

6. The Government of India agrees that the funds being agreed in principle by the Executive Committee at its 37<sup>th</sup> Meeting for the complete phase-out of CFCs in the Foam Sector are the total funding that will be available to India to enable its full compliance with the reduction and phase-out as agreed with the Executive Committee, and that no additional Multilateral Fund resources will be forthcoming for any related activities in the Foam Sector. It is also understood that aside from the agency fees referred to in paragraph 8 below, the Government of India, the Multilateral Fund, and its Implementing Agencies, and bilateral donors will neither request nor provide further Multilateral Fund related funding for the accomplishment of the total phase-out of CFCs in the Foam Sector in India.

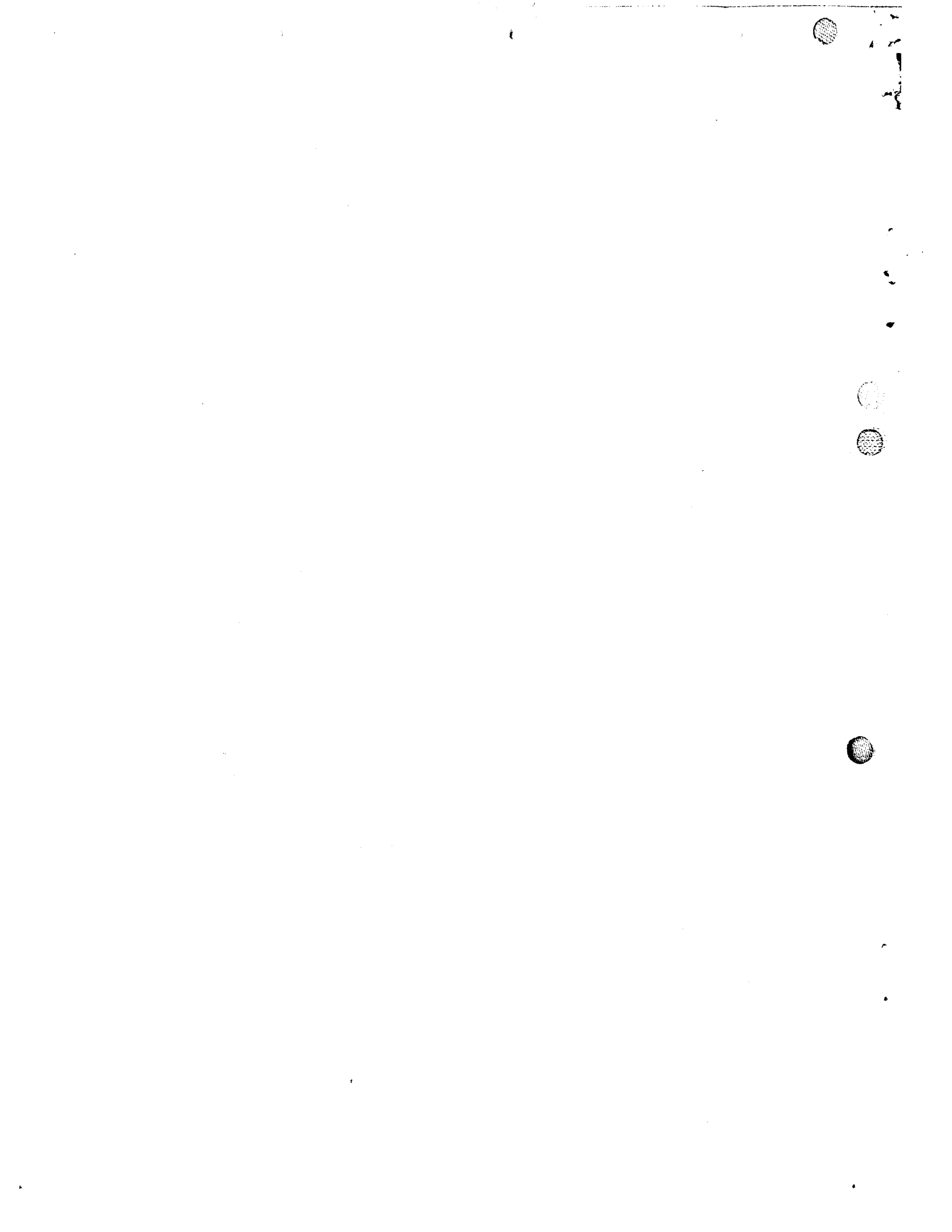
7. The Government of India agrees that if the Executive Committee meets its obligations under this Agreement, but India does not meet the reduction requirements outlined in Table-1 and other requirements outlined in this Agreement, the Implementing Agency and the Multilateral Fund will withhold subsequent tranches of funding outlined in Table-1, until such time as the required reduction has been met. It is clearly understood that the fulfillment of this Agreement depends on the satisfactory performance by both the Government of India and the Executive Committee of their obligations. In addition, India understands that with respect to all calendar year targets beginning with 2002, the Multilateral Fund will reduce the subsequent tranches and therefore the total funding for Annex-A Group-I substances in the amount of US\$ 16,200 per ODP MT of reductions in consumption not achieved in any year, unless the Executive Committee decides otherwise.

8. UNDP is the Implementing Agency for the implementation of this Phase-out Plan, which will be completed by the end of 2006. A fee of a total of 9% of the value of investment activities and 5% of the value of policy and management support activities been agreed in accordance the relevant Executive Committee Decisions as indicated in Table-1. As the main implementing agency, UNDP would be responsible for the following:

- a) Ensuring performance and financial verification in accordance with specific UNDP procedures and requirements as specified in the Foam Sector Phase-out Plan;
- b) Reporting on the implementation of the annual implementation programmes to be included as part of each annual programme starting with the submission for the 2004 annual implementation programme prepared in 2003;
- c) Providing verification to the Executive Committee that the control targets listed Table-1 and the associated activities have been met;

- d) Ensuring that technical reviews undertaken by UNDP are undertaken by appropriate independent technical experts;
- e) Assisting India in preparation of annual implementation programmes, which will incorporate achievements in previous annual programmes;
- f) Carrying out required supervision missions;
- g) Ensuring the presence of an operating mechanism to enable effective, transparent implementation of the programme, and accurate data reporting;
- h) Verifying to the Executive Committee that CFC consumption phase-out in the Foam Sector has been completed based on the schedules listed in Table-1;
- i) Ensuring that disbursements are made to India based on agreed performance targets in the project and provisions in this Agreement;
- j) Providing assistance for policy, management and technical support for implementation of the Sector Phase-out Plan, as and when required.

9. The Government of India also commits through this Agreement, to permanently sustain the reductions indicated in Table-1. As a result of this project, India's maximum level of CFCs remaining eligible for funding is 1,530.4 ODP MT.



**Standard annex to sub-programme documents for use in countries, which are not party to the Standard Basic Assistance Agreement (SBAA).**

1. The standard text below must be attached to and will become an integral part of every sub-programme document to be signed by a Government, which has not yet signed the SBAA. The attachment of annex is a pre-condition to the approval of any new sub-programme in those countries, whether the approval takes place at headquarters of the field. It is the Resident Representative's responsibility to ensure that annexe is incorporated in all sub-programme documents prior to signature by the Government.
2. The regional bureaux are responsible for monitoring adherence to this required procedure. If a country refuses to sign the annex, this becomes a matter of policy that must be referred to the Administrator.
3. Subsection 2.0, below, lists that Government, which have signed the SBAA. The standard annex to the sub-programme document set out below is required only if the country does not appear on this list.

1.0 Standard Text: Supplemental Provisions to the Sub-programme  
Document: The legal context

General responsibilities of the Government, UNDP and the executing agency

1. All phase and aspects of UNDP assistance to this sub-programme shall be governed by and carried out in accordance with the relevant and applicable resolutions and decisions of the competent United Nations organs and in accordance with UNDP policies and procedures for such sub-programmes, and subject to the requirements under UNDP Monitoring, Evaluation and Reporting System.
2. The Government shall remain responsible for this UNDP-assisted development sub-programme and the realisation of its objectives as described in this Sub-programme Document.
3. Assistance under this sub-programme document being provided for the benefit of the Government and the people of (the particular country or territory), the Government shall bear all risks of operations in respect of this sub-programme.
4. The Government shall provide to the sub-programme the national counterpart personnel training facilities, land, buildings, equipment and other required services and facilities. It shall designate the Government Co-operating Agency named in the cover page of this document (hereinafter referred to as the "Co-operations Agency"), which shall be directly responsible for the implementation of the Government contribution to the sub-programme.
5. The UNDP undertakes to complement and supplement the Government participation and will provide through the Executing Agency the required expert services, training, equipment and other services within the funds available to the sub-programme.

6. Upon commencement of the sub-programme the Executing Agency shall assume the responsibility for sub-programme execution and shall have the status of an independent contractor for this purpose. However, that primary responsibility shall be exercised in consultation with UNDP and in agreement with the Co-operating Agency Arrangements to this effect shall be stipulated in the Sub-programme Document as well as for the transfer of this responsibility to the Government or to an entity designated by the Government during the execution of the sub-programme.

7. Part of the Government's participation may take the form of cash contribution to UNDP. In such cases, the Executing Agency will provide the related services and facilities and will account annually to the UNDP and to the Government for expenditure incurred.

(a) Participation of the Government

1. The Government shall provide to the sub-programme the services, equipment and facilities in the quantities and at the time specified in the Sub-programme Document. Budgetary provision, either in kind or in cash, for the Government's participation so specified shall be set forth in the Sub-programme Budgets.
2. The estimated cost of items included in the Government contribution, as detailed in the Sub-programme Budget, shall be based on the best information available at the time of drafting the sub-programme proposal. It is understood that price fluctuations during the period of execution of the sub-programme may necessitate an adjustment of said contribution in monetary terms; the latter shall at all times be determined by the value of the services, equipment and facilities required for the proper execution of the sub-programme.
3. Within the given number of man-months of personnel services described in the sub-programme document, minor adjustments of individual assignments of sub-programme personnel provided by the Government, may be made in consultation with the Executive Agency, if this is found to be in the best interest of the sub-programme. UNDP shall be so informed in all instances where such minor adjustments involve financial implications.
4. The Government shall continue to pay the local salaries and appropriate allowances of national counterpart personnel during the period of their absence from the sub-programme while on UNDP fellowships.
5. The Government shall defray any customs duties and other charges related to the clearance of sub-programme equipment, its transportation, handling, storage and related expenses within the country. It shall be responsible for its installation and maintenance, insurance and replacement, if necessary, after delivery to the sub-programme site.
6. The Government shall make available to the sub-programme - subject to existing security provisions - any published and unpublished reports, maps, records and other data, which are considered necessary to the implementation of the sub-programme.
7. Patent rights, copyrights and other similar rights to any discoveries or work resulting from UNDP assistance in respect of this sub-programme shall belong to the UNDP.



Unless otherwise agreed by the parties in each case, however, the Government shall have the right to use any such discoveries or work within the country free of royalty and any charge of similar nature.

8. The Government shall assist all sub-programme personnel in finding suitable housing accommodation at reasonable rents.
  9. The services and facilities specified in the Sub-programme Document which are to be provided to the sub-programme by the Government by means of a contribution in cash shall be set forth in the sub-programme Budget. Payment of this amount shall be made to the UNDP in accordance with the Schedule of Payments by the Government.
  10. Payment of the above mentioned contribution to the UNDP on or before the dates specified in the Schedule of Payments by the Government is a prerequisites to the commencement or continuation of sub-programme operations.
- (b) Participation of the UNDP and the executing agency
1. The UNDP shall provide to the sub-programme through the Executing Agency the services, equipment and facilities described in the Sub-programme Document. Budgetary provision for the UNDP contribution as specified shall be set forth in the Sub-programme Budget.
  2. The Executing Agency shall consult with the Government and UNDP on the candidature of the Sub-programme Manager\* who, under the direction of the Executing Agency, will be responsible in the country for the Executing Agency's participation in the sub-programme. The Sub-programme Manager shall supervise the experts and other agency personnel assigned to the sub-programme, and the on-the-job training of national counterpart personnel. He shall be responsible for the management and efficient utilisation of all UNDP-financed inputs, including equipment provided to the sub-programme.
  3. The Executing Agency, in consultation with the Government and UNDP, shall assign international staff and other personnel to the sub-programme as specified in the sub-programme Document, select candidates for fellowships and determine standards for the training of national counterpart personnel.
  4. Fellowships shall be administered in accordance with the fellowship regulations of the Executing Agency.
  5. The Executing Agency may, in agreement with the Government and UNDP, execute part or all of the sub-programme by subcontract. The selection of subcontractors shall be made, after consultation with the Government and UNDP, in accordance with the Executing Agency's procedures.
  6. All material, equipment and supplies which are purchased from UNDP resources will be used exclusively for the execution of the sub-programme, and will remain the property of the UNDP in whose name it will be held by the Executing Agency. Equipment supplied by the UNDP shall be marked with the insignia of the UNDP and of the Executing Agency.

7. Arrangements may be made, if necessary, for a temporary transfer of custody of equipment to local authorities during the life of the sub-programme, without prejudice to the final transfer.
8. Prior to completion of UNDP assistance to the sub-programme, the Government, the UNDP and the Executing Agency shall consult as to the disposition of all sub-programme equipment provided by the UNDP. Title to such equipment shall normally be transferred to the Government, or to an entity nominated by the Government, when it is required for continued operation of the sub-programme or for activities following directly therefrom. The UNDP may, however, at its discretion, retain title to part or all of such equipment.
9. At an agreed time after the completion of UNDP assistance to the sub-programme, the Government and the UNDP, and if necessary the Executing Agency, shall review the activities continuing from or consequent upon the sub-programme with a view to evaluating its results.
10. UNDP may release information relating to any investment oriented sub-programme or potential investors, unless and until the Government has requested the UNDP in writing to restrict the release of information relating to such sub-programme.

\* May also be designated Sub-programme Co-ordinator or Chief Technical Adviser, as appropriate.

#### Rights, Facilities, Privileges and Immunities

1. In accordance with the Agreement concluded by the United Nations (UNDP) and the Government concerning the provision of assistance by UNDP, the personnel of UNDP and other United Nations Organisation associated with the sub-programme shall be accorded rights, facilities, privileges and immunities specified in said Agreement.
2. The Government shall grant UN volunteers, if such services are requested by the Government, the same rights, facilities, privileges and immunities as are granted to the personnel of UNDP.
3. The Executing Agency's contractors and their personnel (except nationals of the host country employed locally) shall:
  - (a) Be immune from legal process in respect of all acts performed by them in their official capacity in the execution of the sub-programme;
  - (b) Be immune from national service obligations;
  - (c) Be immune together with their spouses and relatives dependent on them from immigration restrictions;
  - (d) Be accorded the privileges of bringing into the country reasonable amounts of foreign currency for the purposes of the sub-programme or for personal use of such personnel, and of withdrawing any such amounts brought into the country, or in accordance with the relevant foreign exchange regulations, such amounts as may be earned therein by such personnel in the execution of the sub-programme; and

- (e) Be accord together with their spouses and relatives dependent on them the same repatriation facilities in the event of international crisis as diplomatic envoys.
4. All personnel of the Executing Agency's contractors shall enjoy inviolability for all papers a documents relating to the sub-programme.
  5. The Government shall either exempt from or bear the cost of any taxes, duties, fees or levies which it may impose on any firm or organisation which may be retained by the Executing Agency and on the personnel of any such firm or organisation, except for nationals of the host country employed locally, in respect of:
    - (a) The salaries or wages earned by such personnel in the execution of the sub-programme;
    - (b) Any equipment of the sub-programme or which, after having been brought into the country, may be subsequently withdrawn therefrom;
    - (c) Any substantial quantities of equipment, materials and supplies obtained locally for the execution of the sub-programme, such as, for example, petrol and spare parts for the operation and maintenance of equipment mentioned under (b), above, with the provision that the types and approximate quantities to be exempted and relevant procedures to be followed shall be agreed upon with the Government and, as appropriate, recorded in the Sub-programme Document; and
    - (d) As in the case of concessions currently granted to UNDP and Executing Agency's personnel, any property brought, including one privately owned automobile per employee, by the firm or organisation or its personnel for their personal use or consumption or which after having been brought into the country, may subsequently be withdrawn therefrom upon departure of such personnel.
  6. The Government shall ensure
    - (a) Prompt clearance of experts and other persons performing services in respect of this sub-programme; and
    - (b) The prompt release from customs of:
      - (i) Equipment, materials and supplies required in connection with this sub-programme; and
      - (ii) Property belonging to and intended for the personal use or consumption of the personnel of the UNDP, its Executing Agencies, or other persons performing services on their behalf in respect of this sub-programme, except for locally recruited personnel.
  7. The privileges and immunities referred to in the paragraph above, to which firm or organisation and its personnel may be entitled, may be waived by the Executing agency where, in its opinion or in the opinion of the UNDP, the immunity would impede the course of justice and can be waived without prejudice to the successful completion of the sub-programme or to the interest of the UNDP or the Executing Agency.
  8. The Executing Agency shall provide the Government through the Resident Representative with the list of the personnel to whom the privileges and immunities enumerated above shall apply.

9. Nothing in this Sub-programme Document or Annex shall be construed to limit the rights, facilities, privileges or immunities conferred in any other instrument upon any person, natural or juridical, referred to hereunder.

Suspension or termination of assistance

1. The UNDP may be written notice to the Government and to the Executing Agency concerned to suspend its assistance to any sub-programme if in the judgement of the UNDP any circumstance arises which interferes with or threatens to integration of the successful completion of the sub-programme or the accomplishment of its purpose UNDP may, in the same or subsequent written notice, indicate the under which it is prepared to resume its assistance to the sub-programme. Any such suspension shall continue until such time as such conditions are accepted by the Government and as the UNDP shall give written notice to the Government and the Executing Agency that is prepared to resume its assistance.
2. If any situation referred to in paragraph 1, above, shall continue for a period of fourteen days after notice thereof and of suspension shall have been given by the UNDP to the Government and the Executing Agency, then at any time thereafter during the continuance thereof, the UNDP may be written notice to the Government and the Executing Agency terminate the sub-programme.
3. The provisions of this paragraph shall be without prejudice to any other rights or remedies the UNDP may have in the circumstances, whether under general principles of law or otherwise.