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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-eighth Meeting
Montreal, 14-16 July 1999

PROJECT PROPOSALS: INDIA

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

Aerosol

- Phaseout of CFC-12 and CTC by substituting with HAPs at Ruby Aerosols — UNDP
- Phaseout of CFC by substituting HAPs at Syncaps — UNDP
- Phaseout of CFC-12 and CTC at Vimsons Aerosol by substituting HAPs — UNDP

Foam

- Conversion from CFC-11 to HCFC-141b technology in the manufacture of integral skin polyurethane foam at Primrose Multiplast P. Ltd. — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at 28 small and medium-sized enterprises. — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Ashoka Metals — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Devisons P. Ltd. — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at N.D. Plastics — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Nav Texfeb P. Ltd. — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at O.K. Industries — UNDP
- Conversion from CFC-11 to CFC-free technology in the manufacture of rigid polyurethane foam chemical systems at Shivathene Linopack — UNDP

- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Standard Electric Appliances — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Supertek International — UNDP
- Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Varivar Plast Products P.Ltd. — UNDP

Halon

- Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Bharat Engineering Works, Mumbai — UNDP
- Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Cascade Counsel Ltd. New Delhi — UNDP
- Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at M/s Kooverji Devshi & Co. Pvt. Ltd., Mumbai — UNDP
- Extinguisher production and elimination of its consumption of virgin halon 1301 at New Fire Engineers Pvt. Ltd. Mumbai — UNDP
- Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units together with the use of recycled halon 1301 in lieu of virgin product at Standard Castings Pvt. Ltd. New Delhi, under the name of Pyrosafety — UNDP
- Conversion of halon 2111 fire extinguisher production to ABC powder and CO2 units at Zenith Fire Services, Mumbai — UNDP

Process Agents

- Phaseout of use of Carbon tetrachloride as process agent in the production of endosulphan by Excel Industries Limited — IBRD

Solvent

- Conversion of cleaning and coating processes based on CFC-113 to IPA and xylene at Microraj Electronics PVT Ltd. & RCC (Sales) PVT Ltd., Hyderabad (MRJ) — UNIDO
- Conversion of cleaning and coating processes based on CFC-113 and CTC to processes based on IPA at Vidyut Metallics Ltd. (VML) — UNIDO
- Conversion of cleaning processes from TCA and CTC to non-ODS solvent cleaning technologies (trichloroethylene and alkozypropanol) at Videocon Group (VDC) — UNIDO

PROJECT EVALUATION SHEET
INDIA

SECTOR: Aerosol ODS use in sector (1998): 650 ODP tonnes

Sub-sector cost-effectiveness thresholds: Contract Filler

Project Titles:

(a) Phaseout of CFC-12 and CTC by substituting with HAPs at Ruby Aerosols
(b) Phaseout of CFC by substituting HAPs at Syncaps
(c) Phaseout of CFC-12 and CTC at Vimsons Aerosol by substituting HAPs

Project Data	**Contract filler**	**Contract filler**	**Contract filler**
	Ruby	**Syncaps**	**Vimsons**
Enterprise consumption (ODP tonnes)	22.78	53.54	18.16
Project impact (ODP tonnes)	22.78	53.54	18.16
Project duration (months)	30	30	30
Initial amount requested (US $)	90,540	161,518	76,716
Final project cost (US $):			
Incremental capital cost (a)	84,500	153,900	69,900
Contingency cost (b)	8,450	15,390	6,990
Incremental operating cost (c)	-2,410	-7,772	-174
Total project cost (a+b+c)	90,540	161,518	76,716
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
Amount requested (US $)	90,540	161,518	76,716
Cost effectiveness (US $/kg.)	3.82	3.02	4.22
Counterpart funding confirmed?	Yes	Yes	Yes
National coordinating agency	Ministry of Environment & Forests		
Implementing agency	UNDP	UNDP	UNDP

Secretariat's Recommendations			
Amount recommended (US $)	45,800	161,518	66,500
Project impact (ODP tonnes)	22.78	53.54	18.16
Cost effectiveness (US $/kg)	2.01	3.02	3.66
Implementing agency support cost (US $)	5,954	20,997	8,645
Total cost to Multilateral Fund (US $)	51,754	182,515	75,145

PROJECT DESCRIPTION

(a) Phaseout of CFC-12 and CTC by substituting with HAPs at Ruby Aerosols

(b) Phaseout of CFC by substituting HAPs at Syncaps
(c) Phaseout of CFC-12 and CTC at Vimsons Aerosol by substituting HAPs

1. In 1993, the total consumption of CFCs in the aerosol sector in India amounted to 1,400 tonnes. The progress report on the implementation of the country programme submitted by the Government of India to the Fund Secretariat reported a consumption of 983 ODP tonnes of CFC in the aerosol sector in 1997.

2. The Executive Committee has approved 20 investment projects for the phase out of 646 tonnes of CFCs used in the manufacturing of aerosol products and allocated US $2 million for their implementation. The progress report (as of December 1998) submitted by the implementing agencies to the 28th Meeting of the Executive Committee reported that 105 ODP tonnes have already been phased out and US $ 954,533 has been disbursed.

3. The Government of India is submitting three additional projects which would lead to elimination of 94.4 tonnes of ODSs. The projects are for the replacement of CFCs with hydrocarbon propellant (HAP) used in manufacturing different types and sizes of aerosol products, as shown below:

Enterprise	Cans/year	ODSs (tonne)	Products
Ruby Aerosols	35,080	16.62 (CFC) 5.50 (CTC)	Video head cleaner, silicon mold
Vimsons Aerosol*	76,465	8.51 (CFC) 9.65 (CTC)	Silicon mold release
Syncaps*	840,500	53.54 (CFC)	Silicon sprays, mold release

* Contract fillers and own-fillers

4. Based on the CFC baseline for India's compliance with the Montreal Protocol, the elimination of 94.4 ODP tonnes would represent 1.41 per cent of the baseline.

5. The present aerosol filling lines at Ruby consists of four locally-made manual filling machines (10 cans/min each), a liquid filler, two crimpers (for cans and bottles) and a gasser. The other plants (Vimsons and Syncaps) operate with semi-automatic filling machines, with liquid filler (two units in Syncaps), crimper (two units in Syncaps) and a gasser.

6. The enterprises will convert to HAPs technology. Conversion entails installation of two-table semi-automatic aerosol filling machines with propellant handling systems to be located in open air filling rooms, manual-operated water baths for testing filled cans, portable gas detectors, explosion proof fans and electrical connections. In the case of Syncaps, a safe filling room is required since the plant location and its layout would not allow for the installation of an open-air filling room.

7. Technical assistance will be provided for developing new formulations, technology transfer and plant safety training.

8. Each company has provided a letter of commitment stating that the project can be submitted by UNDP to the Executive Committee; each accepts the project as proposed in the project document; it will completely phase out the use of CFCs upon project completion; dispose any equipment that has been replaced; provide funds for items that are included in the project but are specifically excluded from funding by the Multilateral Fund, and will allow monitoring inspections by UNDP during project implementation.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat requested UNDP to provide a verification by its consultant and certification by the Government of India that the enterprises Vimsons Aerosol and Syncaps operated as "contract fillers", according to Decision 25/19.

2. Additional information describing the baseline of the filling lines in Ruby was requested in order to assess any capacity increase and/or technology upgrade associated with the replacement equipment being proposed. Justification for the request of some equipment, particularly the semi-automatic filling machines, was provided by UNDP.

3. Operating savings were adjusted after re-analyzing the formulations for some of the products when switching to hydrocarbon propellant.

RECOMMENDATION

1. The Fund Secretariat recommends blanket approval of the projects at the funding levels indicated below:

	Project Title	Project Cost (US$)	Support Cost (US$)	Implementing Agency
(a)	Phaseout of CFC-12 and CTC by substituting with HAPs at Ruby Aerosols	45,800	5,954	UNDP
(b)	Phaseout of CFC by substituting HAPs at Syncaps	161,518	20,997	UNDP
(c)	Phaseout of CFC-12 and CTC at Vimsons Aerosol by substituting HAPs	66,500	8,645	UNDP

PROJECT EVALUATION SHEET
INDIA

SECTOR: Foam ODS use in sector (Baseline): 2,391 ODP tonnes

Sub-sector cost-effectiveness thresholds: Integral skin US $16.86/kg
Rigid US $7.83/kg

Project Titles:

(a) Conversion from CFC-11 to HCFC-141b technology in the manufacture of integral skin polyurethane foam at Primrose Multiplast P. Ltd.
(b) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at 28 small and medium-sized enterprises.
(c) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Ashoka Metals
(d) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Devisons P. Ltd.
(e) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at N.D. Plastics
(f) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Nav Texfeb P. Ltd.

Project Data	**Integral skin**	**Rigid**	**Rigid**	**Rigid**	**Rigid**	**Rigid**
	Primrose	**28 SMEs**	**Ashoka Metals**	**Devisons**	**N.D. Plastics**	**Nav Texfeb**
Enterprise consumption (ODP tonnes)	10.62	118.80	13.50	16.50	14.00	34.69
Project impact (ODP tonnes)	9.63	105.70	12.47	15.25	12.94	32.37
Project duration (months)	30	30	30	30	30	30
Initial amount requested (US $)	117,105	720,940	73,566	114,940	101,289	163,982
Final project cost (US $):						
Incremental capital cost (a)	80,000	635,581	50,000	65,000	65,000	30,000
Contingency cost (b)	8,000	63,558	5,000	6,500	6,500	3,000
Incremental operating cost (c)	29,105	0	13,066	43,440	36,858	130,982
Total project cost (a+b+c)	117,105	699,139	68,066	114,940	108,358	163,982
Local ownership (%)	100%	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%	0%
Amount requested (US $)	117,105	699,139	68,066	114,940	101,289	163,982
Cost effectiveness (US $/kg.)	12.16	6.61	5.46	7.54	7.83	5.07
Counterpart funding confirmed?					Yes	
National coordinating agency	Ministry of Environment & Forests					
Implementing agency	UNDP	UNDP	UNDP	UNDP	UNDP	UNDP

Secretariat's Recommendations						
Amount recommended (US $)	117,105	699,139	68,066	114,940	101,289	163,982
Project impact (ODP tonnes)	9.63	105.70	12.47	15.25	12.94	32.37
Cost effectiveness (US $/kg)	12.16	6.61	5.46	7.54	7.83	5.07
Implementing agency support cost (US $)	15,224	86,905	8,849	14,942	13,168	21,318
Total cost to Multilateral Fund (US $)	132,329	786,044	76,915	129,882	114,457	185,300

PROJECT EVALUATION SHEET
INDIA

SECTOR: Foam ODS use in sector (Baseline): 2,391 ODP tonnes

Sub-sector cost-effectiveness thresholds: Rigid US $7.83/kg

Project Titles:

(g) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at O.K. Industries
(h) Conversion from CFC-11 to CFC-free technology in the manufacture of rigid polyurethane foam chemical systems at Shivathene Linopack
(i) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Standard Electric Appliances
(j) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Supertek International
(k) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Varivar Plast Products P.Ltd.

Project Data	**Rigid**	**Rigid**	**Rigid**	**Rigid**	**Rigid**
	O.K. Industries	**Shivathene**	**Standard Electric**	**Supertek**	**Varivar**
Enterprise consumption (ODP tonnes)	11.60	119.00	10.80	11.50	13.29
Project impact (ODP tonnes)	10.72		9.98	10.63	12.28
Project duration (months)	30	30	30	30	30
Initial amount requested (US $)	71,727	287,100	78,136	83,202	96,184
Final project cost (US $):					
Incremental capital cost (a)	50,000	190,000	60,000	60,000	65,000
Contingency cost (b)	5,000	19,000	6,000	6,000	6,500
Incremental operating cost (c)	11,227	0	28,434	30,277	35,000
Total project cost (a+b+c)	66,227	209,000	94,434	96,277	106,500
Local ownership (%)	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%
Amount requested (US $)	66,227	209,000	78,136	83,202	96,184
Cost effectiveness (US $/kg.)	6.69	0.00	7.83	7.83	7.83
Counterpart funding confirmed?			Yes	Yes	Yes
National coordinating agency	Ministry of Environment & Forests				
Implementing agency	UNDP	UNDP	UNDP	UNDP	UNDP

Secretariat's Recommendations					
Amount recommended (US $)	66,227	209,000	78,136	83,202	96,184
Project impact (ODP tonnes)	10.72		9.98	10.63	12.28
Cost effectiveness (US $/kg)	6.17		7.83	7.83	7.83
Implementing agency support cost (US $)	8,610	27,170	10,158	10,816	12,504
Total cost to Multilateral Fund (US $)	74,837	236,170	88,294	94,018	108,688

PROJECT DESCRIPTION

(a) Conversion from CFC-11 to HCFC-141b technology in the manufacture of integral skin polyurethane foam at Primrose Multiplast P. Ltd.

(b) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Ashoka Metals

(c) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Devisons P. Ltd.

(d) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at N.D. Plastics

(e) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at O.K. Industries

(f) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Varivar Plast Products P.Ltd.

(g) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Nav Texfeb P. Ltd.

(h) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Supertek International

(i) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Standard Electric Appliances

(j) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at 28 small and medium-sized enterprises.

(k) Conversion from CFC-11 to CFC-free technology in the manufacture of rigid polyurethane foam chemical systems at Shivathene Linopack

Sector Background

- Latest available total ODS consumption (1997)		7,549.4	ODP tonnes
- Baseline consumption* of Annex A Group I substances (CFCs)		6,681	ODP tonnes
- 1998 consumption of Annex A Group I substances		Not reported	
- Baseline consumption of CFCs in foam sector		2,391.2	ODP tonnes
- 1998 consumption of CFCs in foam sector		Not reported	
- Funds approved for investment projects in foam sector as of March 1999 (27th Meting)	US $	16,870,775	
- Quantity of CFC to be phased out in foam sector as of March 1999 (27th Meeting)		2,179.4	ODP tonnes
- Quantity of CFC phased out in foam sector as of March 1999 (27th Meeting)		603.1	ODP tonnes

*Baseline consumption of Annex A controlled substances refers to average of the consumption for the years 1995-1997 inclusive.

Other relevant information:

1. Eleven projects are being submitted to the 28th Executive Committee Meeting in the foam sector. If approved and implemented 232 ODP tonnes of CFC-11 will be phased out.

Impact of the Projects

2. The 232 ODP tonnes to be phased out constitutes 3.5 per cent of India's baseline consumption of Annex A Group I substances and 9.7 per cent of its foam sector baseline consumption. There will be a residual ODP of 23.3 ODP tonnes due to the use of HCFC-141b as substitute blowing agent.

Justification for the Use of HCFC-141b

3. Justification for the use of HCFC-141b including comparative technological and economic analysis of alternative technologies has been provided in each project document. A letter from the Ministry of Environment and Forests supporting the use of HCFC-141b by the enterprises is attached as an annex to this evaluation.

(a) Conversion from CFC-11 to HCFC-141b technology in the manufacture of integral skin polyurethane foam at Primrose Multiplast P. Ltd.

4. Primrose Multiplast P. Ltd. started production in 1994. It consumed 10.62 tonnes of CFC-11 annually in the production of integral skin polyurethane foam. The production line will be converted to HCFC-141b (and partial water) based systems as the interim technology, with a later conversion to an ODS-free technology. The enterprise operates a low-pressure foam dispenser in the baseline, which will be retrofitted. The project costs include the cost of retrofitting the existing foam dispenser (US $25,000), mold replacement (US $25,000), mold heating (US $ 10,000), trials (US $5,000), technical assistance (US $ 10,000) and training (US $5,000). Incremental operating costs amount to US $29,105.

(b) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Ashoka Metals

(c) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Devisons P. Ltd.

(d) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at N.D. Plastics

(e) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at O.K. Industries

(f) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Varivar Plast Products P.Ltd.

(g) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Nav Texfeb P. Ltd.

(h) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Supertek International

(i) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Standard Electric Appliances

5. Ashoka Metals, Devisons, N.D. Plastics, O.K. Industries and Varivar Plast Products manufacture rigid polyurethane foam thermoware products.

6. Nav Texfeb, Standard Electric and Supertek manufacture rigid polyurethane foam for various applications including hard tops for automobiles (Nav Texfeb), domestic water heaters (Standard Electric) and slabs, boards, panels, pipe sections etc (Supertek).

7. The enterprises' baselines and project costs are shown below.

Enterprise	ODS Use Tonnes	Started Production	Baseline	Incremental Capital Cost US $	Incremental Operational Cost US $
Ashoka	13.50	1990	Manual operation	60,500	13,066
Devisons	16.50	1987	Low pressure dispenser	71,500	43,440
N.D. Plastics	14.00	Mar. 1995	Low pressure dispenser	71,500	36,858
O.K. Industries	11.60	1990	Manual operation	60,500	11,227
Varivar	13.29	1994	Low pressure dispenser	71,500	35,000
Nav Texfeb	34.69	1986	High pressure dispenser	33,000	130,982
Standard	10.80		Low pressure dispenser	66,000	78,434
Supertek	11.50		Low pressure dispenser	66,000	30,277

8. All the eight enterprises will convert their operations to HCFC-141b based systems as an interim technology with a later conversion to ODS-free technology. The interim period is expected to be 3-4 years or longer.

9. The enterprises producing thermoware products using low pressure dispensers will have the dispensers replaced with medium pressure foam dispensers of equivalent capacity at US $45,000. Those doing manual operations will be provided with medium pressure foam dispensers at US $30,000 which takes into account enterprise contribution of US $10,000. The other enterprises using low pressure dispensers will have them replaced by 12 kg/min high pressure dispensers at US $40,000 while the enterprise using high pressure dispenser will have it retrofitted at the cost of US $10,000.

10. Technology transfer, trials and training costs for each enterprise will be US $10,000, US $5,000 and US $5,000 respectively.

(j) Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at 28 small and medium-sized enterprises

11. This project covers 28 small and medium sized enterprises (SMEs) which have commenced foam production prior to 25 July 1995. The profile of the 28 enterprises is shown in Table 1 attached to this evaluation. They consumed an estimated 118.80 tonnes of CFC-11 determined from annual consumption of polyol containing 30% CFC-11. Twenty-two enterprises produce rigid polyurethane foam for thermoware, while the rest produce foam for general insulation applications. They will all convert to HCFC-141b-based systems as the interim technology, with a later conversion to an ODS-free technology. The 28 enterprises in the project represent about 20% of the SMEs in the foam sector in India. The project will be implemented in conjunction with the project for Shivathene Linopack (simultaneously submitted for Executive Committee approval), a local polyurethane chemical systems producer.

Shivathene Linopack will customize the CFC-free systems required by these SMEs to implement the conversion.

12. Seventeen of the enterprises have low-pressure foam dispensers, while the rest use hand mixing technique. Both the use of low pressure machines and hand mixing will be replaced by new medium-pressure foam dispensers to enable use of the new technology. The replacement foam dispensers will cost US $20,000 each for projects with low pressure dispenser in the baseline, while for handmixing there will be 33% counterpart funding to account for technology upgrade. The total project cost includes the costs of medium-pressure foam dispensers (US $487,400), trials (US $70,000), technical assistance (US $70,000) and training (US $28,000). Incremental operating costs are not claimed subject to simultaneous approval of the project of Shivathene Linopack. It is expected that with the involvement of Shivathene Linopack there would not be much difference in the prices of the new and old systems to the group of SMEs.

(k) Conversion from CFC-11 to CFC-free technology in the manufacture of rigid polyurethane foam chemical systems at Shivathene Linopack.

13. In this project, the facilities for the production of polyether and polyester-based polyols at Shivathene Linopack, will be converted to enable production of CFC-free formulations. The project envisages the establishment of facilities for customizing, trials, evaluation and validation of CFC-free formulations, which will ensure indigenous and economic availability of these formulations, and also lead to a substantial indirect reduction in the incremental costs of phase out of CFCs by the small and unorganized downstream foam producers serviced by this enterprise.

14. This project is in line with the Government of India's policy to support the role of the polyol producers, in making CFC-free formulations available to the user industry similar to the previous approved projects in this sector viz., Manali Petrochemicals, UB Petroproducts, Expanded Incorporation and Polymermann. The project will be implemented in conjunction with the second group project covering small and medium enterprises (SMEs) in the rigid polyurethane foam sub-sector. The project costs include partial costs of a high pressure foam dispenser (US $90,000) and premixer (US $65,000), laboratory reactor and blender (US $50,000), evaluation equipment (US $25,000), molds and jigs (US $15,000), trials (US $20,000), technical assistance (US $15,000) and training (US $5,000). Incremental operating costs are not claimed.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

<u>Primrose, Ashoka, Devisons, N.D. Plastics, Nav Texfeb, O.K. Industries, Standard Electric, Supertek and Varivar</u>

1. The costs of these projects were agreed between the Fund Secretariat and UNDP. The agreed project costs are as indicated in the Secretariat's recommendations on the Project

Evaluation Sheet. The capital costs of Ashoka Metals and O.K. Industries were corrected for minor errors of calculation.

Projects for 28 SMEs and Shivathene Linopack

2. Information provided by UNDP indicates that there are an estimated 140 foam sector SMEs accounting for consumption of 550-600 tonnes. The first SME project was approved at the 22nd Meeting (May 1997) for 80 enterprises together with one system house to phase out 290 tonnes CFC-11. The approval of this second SME project will result in total coverage of 70% of the SMEs in the foam sector and account for 70-75% of their consumption. Thus 30-35 enterprises accounting for the remaining CFC-11 consumption remain to be funded to phase out their CFC consumption.

3. Following discussion of the SME group project and Shivathene Linopack project the following costs were agreed.

SME Project

Incremental capital cost	US $635,581
10% contingency	US $63,558
Total	US $699,139

4. Since no incremental operational costs are requested the eligible grant would be US $699,139. The project costs of 5 enterprises which exceeded the threshold funding limit were adjusted to the level of the threshold limit. The costs of the individual projects are shown in table 1 (attached to this evaluation).

Shivathene Linopack

5. Considering the company's baseline and current activities it was agreed to provide partial funding for the items of equipment except the closed system premixing station (US $65,000) since the existing premixer needed to be replaced. The total capital cost including US $35,000 for technical assistance, trials and training was determined to be US $190,000.

6. The project cost does not include incremental operational cost since the company does not by itself phase out any ODS. Similarly the project cost has not been subject to calculation of cost-effectiveness.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the projects for Primrose Multiplast, 28 SMEs, Ashoka Metals, Devisons, N.D. Plastics, Nav Texfeb, O.K. Industries, Shivathene Linopack, Standard Electric Appliances, Supertek International and Varivar Plast Products with the level of funding and associated support costs indicated in the table below.

	Project Title	Project Cost (US$)	Support Cost (US$)	Implementing Agency
(a)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of integral skin polyurethane foam at Primrose Multiplast P. Ltd.	117,105	15,224	UNDP
(b)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at 28 small and medium-sized enterprises.	699,139	86,905	UNDP
(c)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Ashoka Metals	68,066	8,849	UNDP
(d)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Devisons P. Ltd.	114,940	14,942	UNDP
(e)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at N.D. Plastics	101,289	13,168	UNDP
(f)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Nav Texfeb P. Ltd.	163,982	21,318	UNDP
(g)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at O.K. Industries	66,227	8,610	UNDP
(h)	Conversion from CFC-11 to CFC-free technology in the manufacture of rigid polyurethane foam chemical systems at Shivathene Linopack	209,000	27,170	UNDP
(i)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Standard Electric Appliances	78,136	10,158	UNDP
(j)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulation at Supertek International	83,202	10,816	UNDP
(k)	Conversion from CFC-11 to HCFC-141b technology in the manufacture of rigid polyurethane foam insulated thermoware at Varivar Plast Products P.Ltd.	96,184	12,504	UNDP

Table 1: The Profile of Enterprises in the India SME Project

No	Enterprise Name	Location	Sub-sector	Baseline	Consumption (MT/y)		Funding	Funding	C. E.
					Polyol	CFC-11	Threshold	Request	US$/kg/y
1	Advance Vacuum Flasks P. Ltd.	Ghaziabad	RPUF Thermoware	Dispenser	12.00	3.60	28,188	27,600	7.67
2	A. R. Plastics	Delhi	RPUF Thermoware	Dispenser	6.00	1.80	14,094	14,094	7.83
3	Bhagwati Plastics	Delhi	RPUF Thermoware	Dispenser	15.00	4.50	35,235	29,000	6.44
4	Devi Sahay Rameshwar Das	Delhi	RPUF Thermoware	Dispenser	20.00	6.00	46,980	31,333	5.22
5	Hitech Plastronics	Mohali	RPUF Thermoware	Handmixing	6.00	1.80	14,094	14,094	7.83
6	Instyle Creations	Delhi	RPUF Thermoware	Dispenser	20.00	6.00	46,980	31,333	5.22
7	Kenapo Crimpers P. Ltd.	Delhi	RPUF Thermoware	Dispenser	15.00	4.50	35,235	29,000	6.44
8	Malasiya Plastics	Udaipur	RPUF Thermoware	Handmixing	15.00	4.50	35,235	21,740	4.83
9	Metal Craft	Delhi	RPUF Thermoware	Handmixing	8.00	2.40	18,792	18,473	7.70
10	M. L. Trehan Builders	Pathankot	RPUF General	Handmixing	12.00	3.60	28,188	20,340	5.65
11	Nav Bharat Industrial Corp	Chandigarh	RPUF Thermoware	Dispenser	12.00	3.60	28,188	27,600	7.67
12	Palace Kitchen Equipment	Delhi	RPUF General	Handmixing	10.00	3.00	23,490	19,407	6.47
13	Peacock Vacuum Glass	Faridabad	RPUF Thermoware	Dispenser	15.00	4.50	35,235	29,000	6.44
14	Pressure Insulating Works	Delhi	RPUF General	Handmixing	16.00	4.80	37,584	22,207	4.63
15	Rahul Luggage	Delhi	RPUF Thermoware	Dispenser	29.00	8.70	68,121	35,533	4.08
16	Raj Pollucon	Muzaffarnagar	RPUF General	Handmixing	15.00	4.50	35,235	21,740	4.83
17	Rajeshwari Ware	Delhi	RPUF Thermoware	Dispenser	10.00	3.00	23,490	23,490	7.83
18	Sahib Enterprises	Delhi	RPUF Thermoware	Handmixing	9.00	2.70	21,141	18,940	7.01
19	Sai Thermoplast	Kanpur	RPUF Thermoware	Dispenser	12.00	3.60	28,188	27,600	7.67
20	Sakshi Polymers	Delhi	RPUF Thermoware	Dispenser	18.00	5.40	42,282	30,400	5.63
21	Siyaram Plastics	Kanpur	RPUF Thermoware	Dispenser	12.00	3.60	28,188	27,600	7.67
22	South and North Combines	Delhi	RPUF Thermoware	Dispenser	15.00	4.50	35,235	29,000	6.44
23	Spall	Delhi	RPUF General	Handmixing	15.00	4.50	35,235	21,740	4.83
24	Swati Udyog	Gurgaon	RPUF General	Handmixing	35.00	10.50	82,215	31,073	2.96
25	Varivar Coatings	Kanpur	RPUF Thermoware	Dispenser	10.00	3.00	23,490	23,490	7.83
26	Venus Plastics	Delhi	RPUF Thermoware	Dispenser	11.00	3.30	25,839	25,839	7.83
27	V. M. Packaging	Ghaziabad	RPUF Thermoware	Dispenser	14.00	4.20	32,886	28,533	6.79
28	West Coast Enterprises	Delhi	RPUF Thermoware	Handmixing	9.00	2.70	21,141	18,940	7.01
				TOTAL	**396.00**	**118.80**	**930,204**	**699,139**	**6.61**

Notes

1. The funding request only covers the incremental capital costs.
2. The technical assistance, training, trials and contingencies components are distributed over the enterprises in proportion to their baseline CFC consumption
3. For a handmixing baseline the budget for the new foam dispenser is US $13,400.
4. For a low-pressure foam dispenser baseline the budget for the new foam dispenser is US $20,000.

PROJECT EVALUATION SHEET
INDIA

SECTOR: Halon ODS use in sector (baseline): 1,300 ODP tonnes

Sub-sector cost-effectiveness thresholds: Extinguisher US $1.48/kg

Project Titles:

(a) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Bharat Engineering Works, Mumbai
(b) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Cascade Counsel Ltd. New Delhi
(c) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at M/s Kooverji Devshi & Co. Pvt. Ltd., Mumbai
(d) Extinguisher production and elimination of its consumption of virgin halon 1301 at New Fire Engineers Pvt. Ltd. Mumbai
(e) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units together with the use of recycled halon 1301 in lieu of virgin product at Standard Castings Pvt. Ltd. New Delhi, under the name of Pyrosafety
(f) Conversion of halon 2111 fire extinguisher production to ABC powder and CO2 units at Zenith Fire Services, Mumbai

Project Data	**Extinguisher**					
	Bharat	**Cascade**	**Kooverji**	**New Fire**	**Pyrosafety**	**Zenith**
Enterprise consumption (ODP tonnes)	49.50	597.00	25.50	120.00	64.10	36.00
Project impact (ODP tonnes)	49.50	54.00	25.50	120.00	64.10	36.00
Project duration (months)	30	30	30	30	30	30
Initial amount requested (US $)	73,260	79,920	37,740	177,600	94,868	53,280
Final project cost (US $):						
Incremental capital cost (a)	95,000	67,500	90,000	120,000	100,000	105,000
Contingency cost (b)	9,500	6,750	9,000	12,000	10,000	10,500
Incremental operating cost (c)	-26,726	12,690	-9,545	-2,000	-17,999	-11,454
Total project cost (a+b+c)	77,774	86,940	89,455	130,000	92,001	104,046
Local ownership (%)	100%	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%	0%
Amount requested (US $)	73,260	79,920	37,740	130,000	92,000	53,280
Cost effectiveness (US $/kg.)	1.48	1.48	1.48	1.48	1.44	1.48
Counterpart funding confirmed?	Yes	Yes	Yes	Yes	Yes	Yes
National coordinating agency	Ministry of Environment & Forests					
Implementing agency	UNDP	UNDP	UNDP	UNDP	UNDP	UNDP

Secretariat's Recommendations						
Amount recommended (US $)	73,260	79,920	37,740	130,000	92,000	53,280
Project impact (ODP tonnes)	49.50	54.00	25.50	120.00	64.10	36.00
Cost effectiveness (US $/kg)	1.48	1.48	1.48	1.08	1.44	1.48
Implementing agency support cost (US $)	9,524	10,390	4,906	16,900	11,960	6,926
Total cost to Multilateral Fund (US $)	82,784	90,310	42,646	146,900	103,960	60,206

PROJECT DESCRIPTION

(a) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Bharat Engineering Works, Mumbai

1. The purpose of the project is to eliminate the consumption of 16.5 metric tonnes of halon 1211 (average consumption 1994 to 1997) which equates to a total of 49.5 O.D.P. tons. The project will cover the cost of conversion of production of portable halon fire extinguishers in sizes including 500 grams, 1.25kg, 2.5kg, 5.0kg, 10.0kg, 25.0kg and 50.0kg units to carbon dioxide and A.B.C. powder stored pressure types of varying sizes and all with squeeze grip valve operation.

(b) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Cascade Counsel Ltd. New Delhi

2. The purpose of the project is to eliminate the consumption of 18 metric tonnes of halon 1211 (average consumption 1994 to 1997) which equates to a total of 54 O.D.P. tons. The project will cover the cost of conversion of production of portable halon fire extinguishers in sizes including mainly 600 grams and 1.25kg aerosol units and also some 2.5kg to carbon dioxide and A.B.C. powder stored pressure squeeze grip types of varying sizes.

(c) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at M/s Kooverji Devshi & Co. Pvt. Ltd., Mumbai

3. The purpose of the project is to eliminate the consumption of 8.5 metric tonnes of halon 1211 (average consumption 1994 to 1997) which equates to a total of 25.5 O.D.P. tons. The project will cover the cost of conversion of production of portable halon fire extinguishers in sizes including 1.25kg, 2.5kg and 5.0kg units to carbon dioxide and A.B.C. powder stored pressure types of varying sizes and all with standard squeeze grip valve operation

(d) Extinguisher production and elimination of its consumption of virgin halon 1301 at New Fire Engineers Pvt. Ltd. Mumbai

4. The purpose of the project is to eliminate the consumption of 12 metric tonnes of halon 1301 (average consumption 1994 to 1997) which equates to a total of 120 O.D.P. tons. The company operates totally in the fixed flooding systems market in India which utilises halon 1301 product. The project will cover the cost of providing technology transfer, associated local approval requirements, operational support, service and maintenance capability etc, in order to utilise alternate halon 1301 system replacements in the country.

(d) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Standard Castings Pvt. Ltd. New Delhi, under the name of Pyrosafety

5. The purpose of the project is to eliminate the consumption of 14.7 metric tonnes of halon 1211 and 2.0 metric tonnes of halon 1301 (average consumption 1994 to 1997) which equates to a total of 64.1 O.D.P. tons. The project will cover the cost of conversion of production of portable halon fire extinguishers in sizes including 1.25kg, 1.5kg and 50.0kg units to carbon

dioxide and A.B.C. powder stored pressure squeeze grip types of varying sizes. Virgin halon 1301 consumption will be replaced with recycled product.

(e) Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units together with the use of recycled halon 1301 in lieu of virgin product at Standard Castings Pvt. Ltd. New Delhi, under the name of Pyrosafety

6. The purpose of the project is to eliminate the consumption of 12.0 metric tonnes of halon 1211 (average consumption 1994 to 1997) which equates to a total of 36 O.D.P. tons. The project will cover the cost of conversion of production of portable halon 1211 fire extinguishers in sizes including 1.25kg, 2.5kg, 5.0kg, 10.0kg and 25.0kg units to carbon dioxide and A.B.C. powder stored pressure alternatives, both incorporating squeeze grip valve type operation.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. These projects are consistent with previous projects approved in this sub-sector and are consistent with the guidelines for halon fire extinguishers.

2. These projects are included in India's Halon Phase-out Strategy included in document UNEP/OzL.Pro/ExCom/28/50.

3. India indicated that with the approval of these projects, the remaining projects in this sub-sector involve small and medium-sized enterprises with a maximum consumption of 10 tonnes.

4. UNDP indicated that its consultant had visited a few of these SMEs and was of the opinion that the projects would not be eligible for assistance from the Multilateral Fund.

RECOMMENDATION

1. The Fund Secretariat recommends blanket approval of these projects with the funding level and associated support costs as indicated below:

	Project Title	Project Cost (US$)	Support Cost (US$)	Implementing Agency
(a)	Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Bharat Engineering Works, Mumbai	73,260	9,524	UNDP
(b)	Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at Cascade Counsel Ltd. New Delhi	79,920	10,390	UNDP
(c)	Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units at M/s Kooverji Devshi & Co. Pvt. Ltd., Mumbai	37,740	4,906	UNDP
(d)	Extinguisher production and elimination of its consumption of virgin halon 1301 at New Fire Engineers Pvt. Ltd. Mumbai	130,000	16,900	UNDP

(e)	Conversion of halon 1211 fire extinguisher production to ABC powder and CO2 units together with the use of recycled halon 1301 in lieu of virgin product at Standard Castings Pvt. Ltd. New Delhi, under the name of Pyrosafety	92,000	11,960	UNDP
(f)	Conversion of halon 2111 fire extinguisher production to ABC powder and CO2 units at Zenith Fire Services, Mumbai	53,280	6,926	UNDP

PROJECT EVALUATION SHEET
INDIA

SECTOR: Process Agent ODS use in sector (1998): 1797.0 ODP tonnes

Sub-sector cost-effectiveness thresholds: N/A US $/kg

Project Titles:

(a) Phaseout of use of Carbon tetrachloride as process agent in the production of endosulphan by Excel Industries Limited

Project Data	**Process conversion**
	Excel
Enterprise consumption (ODP tonnes)	400.00
Project impact (ODP tonnes)	375.00
Project duration (months)	24
Initial amount requested (US $)	559,105
Final project cost (US $):	
Incremental capital cost (a)	490,550
Contingency cost (b)	49,055
Incremental operating cost (c)	19,500
Total project cost (a+b+c)	559,105
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US $)	
Cost effectiveness (US $/kg.)	1.43
Counterpart funding confirmed?	
National coordinating agency	Ministry of Environment and Forests
Implementing agency	IBRD

Secretariat's Recommendations	
Amount recommended (US $)	
Project impact (ODP tonnes)	
Cost effectiveness (US $/kg)	
Implementing agency support cost (US $)	
Total cost to Multilateral Fund (US $)	

PROJECT DESCRIPTION

Phaseout of use of Carbon tetrachloride as process agent in the production of endosulphan by Excel Industries Limited

Background

1. This is the first project to be presented to the Executive Committee to phase out the consumption of ODS used as a process agent. In this case, carbon tetrachloride (CTC) is used as a process agent in the manufacture of endosulphan, a pesticide.

2. In Decision 27/78, the Committee agreed that, inter-alia, "on the broad principles that have been agreed, implementing agencies could submit a limited number of projects conforming to the agreed broad principles, for consideration at the Twenty-eighth Meeting". The framework guidelines/broad principles for process agent projects are attached to this evaluation sheet for information (Annex I).

Sector profile

3. As required by the framework guidelines, India has submitted with the project proposal a sector profile or overview (Annex II, attached). The sector profile indicates the application-wide usage and emissions of CTC in India (Section 2.1.1). The total CTC consumption in 1998-99 is 1978 ODP tonnes, up from 1166 ODP tonnes reported in the 1993 country programme. The 30 main users for whom projects are proposed to be submitted are listed in Section 4. Of these, 22 are in the pharmaceuticals sub-sector, five are in chlorinated rubber manufacture and three in agrochemicals. The alternative technologies proposed for each application are listed in Section 3. It would appear from Section 3 that phase-out is proposed to be achieved through process conversion in all cases. Emissions reduction, plant rationalisation and plant closure are not mentioned.

4. In relation to production of endosulphan, the sector profile identifies two producers out of the three in agrochemicals, Excel Industries Ltd. and EID Parry (India) Ltd. This project is for Excel.

Project Description

5. Excel Industries consumed an average of 400 ODP tonnes of carbon tetrachloride annually in the manufacture of endosulphan in the period 1995 to 1997. Approximately 1.7 tonnes of CTC is used in the manufacture of each 1 tonne batch of endsosulphan. 4 percent of this quantity of CTC is lost to the atmosphere in each batch, the remainder is recycled. The 400 tonnes is the total quantity lost in the annual production of some 5600 batches.

6. The project proposes the replacement of carbon tetrachloride with ethylene dichloride (EDC), a non-ODS solvent. The project document indicates that the process technology does not change with the change of solvent but that, because a larger quantity of the new solvent is required to process each batch, some process equipment needs to be enlarged. As well, some

new equipment needs to be installed and modifications to heating and cooling systems are needed to cater for the different characteristics of EDC as opposed to CTC. Finally as EDC is flammable, modifications need to be made to the plant, including proposed relocation of auxiliary equipment such as chillers, to meet safety requirements. The proposed technology was developed in-house by Excel.

7. It is stated in the proposal that the emissions control equipment needed to further reduce CTC losses, if the process agent was not changed, would be elaborate, is not available in India, would be expected to have very high capital costs, and would not achieve significant reductions in CTC emissions.

8. The main capital cost items requested are as follows: 8 new reaction vessels, four tanks and two high vacuum systems, US $179,000; civil and electrical works, US $30,750; additional refrigerant unit and water tank, US $38,000; electrical installations for relocated chillers US $39,200; new piping US $84,500; installation costs US $33,000; insulation and painting of pipes and vessels US $53,000; fire extinguishers and other minor safety equipment US $24,000. The total requested capital cost is US$539,605. Incremental operating costs are sought for 1 year at a level of US $19,500. The project as submitted has a cost effectiveness of US$1.43 /kg.

SECRETARIAT'S COMMENTS

1. In regard to the framework guidelines for process agent projects, the proposal has not explicitly addressed the requirement in paragraph 3 that a project proposal should cover all the production facilities in the country for a particular application. As indicated above, the sector profile advises that each of the two manufacturers of endosulphan in India will submit conversion projects.

2. Similarly, the project proposal has not provided a costing of the emissions containment option as requested in paragraph 7 of the guidelines although it is addressed qualitatively. However, the 1997 report of the TEAP Process Agent Taskforce indicated that "the effective implementation of emission minimisation strategies to significantly lower down the emission of CTC is not attainable without carrying out major modifications of plants/facilities and installation of new equipment for monitoring control systems and destruction."

3. Paragraph 4 of the framework guidelines provides that proposals should be prepared consistent with all existing policies and guidelines of the Executive Committee. In particular, new-for-old plant replacement and technological upgrade need to be taken into account in accordance with Decisions 18/25 and 26/37. This has been the focus of the Secretariat's detailed review, which has been aided by reference to a consultant process engineer.

4. Prima facie, the proposal may involve both new-for-old replacement and possibly technological upgrade. The plant itself is some 29 years old, although the age of specific items of equipment and the piping and other installations are not specified. Although the process technology does not change, it is proposed that all the main equipment items in each of the two production "trains" now installed as part of the baseline, be replaced.

5. A greater volume of the new solvent, EDC, is required to produce the same quantity of endosulphan, so it is necessary to provide an increase in the capacity of the various reaction vessels and tanks of about 25 percent. This could be achieved a number of ways, for instance by leaving one production train as it is, and increasing the size of the other as required. However, no options have been discussed in the project other than replacement of all the tanks and vessels in each production train.

6. Similarly there is a need to examine in detail the extent of the work proposed in relation to replacement of piping for the process itself and for the utilities such as chilled water that are required. It is suggested that for safety reasons and to add the necessary additional chiller capacity, the chillers now located in the process area need to be relocated. The enterprise is taking the opportunity to replace all the old chillers. While capital costs are being sought only for the additional chiller needed, other costs for relocation may only be eligible in relation to the additional chiller capacity. Various other items also need specific analysis. For instance, funding for over 2.1 kilometres of armoured electrical cables is requested together with other electrical work at a total cost of US$39,000. Costs are sought for 132 fire extinguishers containing over 1.7 tonnes of various extinguishants.

7. The Secretariat is discussing these eligibility and cost issues in detail with the Word Bank. The results of these discussions will be advised to the Sub-Committee on Project Review.

8. Because of this, and since it is the first project in the process agent sector, it has been referred for individual consideration.

9. The full project document was circulated to members of the Executive Committee for the 27th Meeting as Annex III to document UNEP/OzL.Pro/ExCom/27/40. It can be provided on request, or can be downloaded from the Secretariat's web site (www.unmfs.org).

ANNEX I

FRAMEWORK GUIDELINES/BROAD PRINCIPLES FOR PROCESS AGENT PROJECTS

General principles

1. In conjunction with their first project, countries must provide a thorough sector overview containing all enterprises, stating all consumption and emissions figures and indicating those enterprises for which the country intends to seek compensation from the Multilateral Fund. The country should indicate whether the relevant consumption information has been submitted as part of its Article 7 consumption reports, and if not, its intentions and progress in this regard.

2. For the purpose of project submissions, consumption at the enterprise level is the quantity of process agent in ODP tonnes used annually by the enterprise as 'make-up' in the relevant process. Information on the amount of ODS contained in the process equipment should be included with the project submission.

3. To permit adequate consideration of the industrial rationalisation option, a project proposal should cover all the production facilities in the country for the particular application under consideration.

4. Project proposals should be prepared consistent with all existing policies and guidelines of the Executive Committee. In particular, new-for-old plant replacement and technological upgrade need to be taken into account in accordance with decisions 18/25 and 26/37.

5. Initial projects will be considered for the applications listed in table A of decision X/14 in order to provide information on reasonably achievable emissions reductions and associated costs.

6. The projects should indicate which applicable measures are proposed to control emissions (e.g. emissions control technologies, process conversion, plant rationalisation or closure) the cost effectiveness and the emissions reductions which can be achieved.

7. Where either emissions controls or process changes are proposed, the project submission must include an evaluation of the incremental costs of achieving significant levels of emissions reductions by each technique.

8. The cost-effectiveness of process agent projects will initially be considered on a case by case basis to provide a body of information which can be a basis for the establishment of appropriate cost-effectiveness thresholds in due course.

PROJECT EVALUATION SHEET
INDIA

SECTOR: REFRIGERATION ODS use in sector (1991): 1,990 ODP tonnes

Sub-sector cost-effectiveness thresholds: Domestic US $13.76/kg

Project Titles:

(a) Incremental operating cost for compressors in domestic refrigeration companies

Project Data	**Domestic**				
	BPL	Maharaja	Videocan	Whirlpool	Sarkar
Enterprise consumption (ODP tonnes)	136	59.8	351.7	200.6	12.0
Project impact (ODP tonnes)	136	59.8	351.7	200.6	12.0
Project duration (months)	6	6	6	6	6
Grant already approved for incremental capital cost and incremental operating cost without IOC for compressors (a)	792,906	510,000	1,835,115	675,165	117,100
Incremental operating cost for compressors (b)	309,707	62,974	565,800	296,280	2,760
Total project cost (a+b)	1,032,613	572,974	2,400,915	971,445	119,860
Local ownership (%)	100	44.08	100	42.6	100
Export component (%)	0	0	0	0	0
Amount requested (US $)	309,707	62,974	565,800	296,280	2,760
Cost effectiveness (US $/kg)	7.59	9.59	6.83	4.85	10
National coordinating agency	Ministry of Environment & Forests				
Implementing agency	World Bank				
Combined Amount Requested	1,237,521				
Implementing Agency support cost (US $)	146,127				
Total cost to Multilateral Fund (US $)	1,383,648				

Secretariat's Recommendations:					
Amount recommended (US $) Project impact (ODP tonnes) Cost effectiveness (US $/kg)					
Combined Amount Recommended					
Implementing Agency support cost (US $)					
Total cost to Multilateral Fund (US $)					

PROJECT DESCRIPTION

(a) Incremental operating costs for compressors in domestic refrigeration companies

1. Five domestic and commercial refrigeration projects previously approved for India did not receive funding for incremental operating costs (IOC) associated with the use of HCFC-134a compressors, pending a decision on the methodology for calculations of eligible costs for HFC-134a compressors. Additionally, two projects, for GGEAL and Voltas, sought capital and incremental cost for the conversion of their foam operations only, with the refrigeration part to be submitted at a later date. Decision 26/36 on IOC for compressors, taken by the Executive Committee at its 26th Meeting, has now provided the methodology.

2. The World Bank has submitted a combined proposal requesting IOC for compressors for the five domestic refrigeration companies whose projects are under implementation.

3. According to Decision 26/36, in order to implement the approved methodology, it is necessary to know whether the Government of India intends to seek in the future any funding for conversion of compressor manufacturing or, instead, to request IOC for downstream manufacturers of refrigerators.

4. The Secretariat has been informed by the World Bank that the Government of India does not intend to seek capital cost for conversion of compressor production facilities from the Multilateral Fund after approval of the compensation for IOC for compressors.

5. The eligible level of funding for IOC for compressors in India has now been calculated according to Decision 26/36 on the basis of:

(a) The total production of domestic refrigerators in India is 2,404,544 units per year. Additionally, the Government of India identified production of 250,000 units equipped with compressors equal or below 250 WT which have been manufactured by commercial refrigeration enterprises. The eligible number of refrigerators using compressors below 250 watts has been calculated as the proportion of the total production corresponding to the proportion of Article 5 ownership of the enterprises.

(b) Two compressor manufacturers in India have received assistance from the Multilateral Fund for conversion of total production capacity of 255,000 units per year to HCFC-134a technology. The eligible production capacity of compressors below 250 watts has been calculated for these enterprises, as the proportion of total capacity which has received assistance, corresponding to the proportion of Article 5 ownership of the enterprises.

(c) The discounting factor has been calculated using the ratio of the number of compressor determined under (b) above to the total number of refrigerators determined under (a) above.

(d) This discounting factor has been further adjusted to reflect the number of

compressors for which IOC has already been paid in the approved refrigeration projects to be 0.92.

(e) The IOC for compressors for individual enterprises have been determined on the basis that the difference in cost between an R-12 compressor and an HFC-134a compressor is US $3.00, that IOC are calculated for six month duration, and by applying the calculated discounting factor.

6. The resulting IOC for compressors for each of the five enterprises are shown individually on the cover page of this evaluation sheet. The total allocation requested for approval is US $1,237,521. Agency support costs have been determined on the basis of the total cost of the combined proposal.

7. The IOC for compressors for the two companies which have not yet sought funding for conversion of their refrigerant operations, GGEAL and Voltas, cannot be finally calculated until project proposals for refrigeration conversion are received from the enterprises. The IOC will depend, inter alia, on the technology selected, and the overall cost effectiveness of the projects. However, the discounting factor determined as outlined above, will continue to apply to these enterprises.

8. The same discounting factor will also apply to commercial refrigeration enterprises regarding IOC for compressors for that part of their production using compressors below or equal to 250 Watts.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The calculation outlined above has been based on the methodology in Decision 26/36 as it applies to the specific situation in India, taking into account compensation received in relation to conversion of compressor manufacturing capacity and the stated intentions of enterprises which have not yet submitted projects. The calculation has produced a discounting factor, which can be applied to any future projects requesting IOC for compressors less than 250 Watts.

2. The project is submitted for individual consideration since it is the first project developed to implement Decision 26/36.

PROJECT EVALUATION SHEET
INDIA

SECTOR: Solvent ODS use in sector (1998): 3,364 ODP tonnes

Sub-sector cost-effectiveness thresholds: CFC-113 US $19.73/kg

Project Titles:

(a) Conversion of cleaning and coating processes based on CFC-113 to IPA and xylene at Microraj Electronics PVT Ltd. & RCC (Sales) PVT Ltd., Hyderabad (MRJ)
(b) Conversion of cleaning and coating processes based on CFC-113 and CTC to processes based on IPA at Vidyut Metallics Ltd. (VML)
(c) Conversion of cleaning processes from TCA and CTC to non-ODS solvent cleaning technologies (trichloroethylene and alkozypropanol) at Videocon Group (VDC)

Project Data	**CFC-113**	**CFC-113**	**Multiple solvents**
	Microraj	**Vidyut**	**Videocon**
Enterprise consumption (ODP tonnes)	4.33	12.00	7.20
Project impact (ODP tonnes)	4.33	19.69	7.20
Project duration (months)	18	18	18
Initial amount requested (US $)	85,431	388,484	235,906
Final project cost (US $):			
Incremental capital cost (a)	164,500	346,700	267,500
Contingency cost (b)	16,450	15,950	26,750
Incremental operating cost (c)	-65,416	-137,198	194,638
Total project cost (a+b+c)	115,534	225,452	488,888
Local ownership (%)	100%	100%	100%
Export component (%)	0%	10%	10%
Amount requested (US $)	85,431	225,452	234,978
Cost effectiveness (US $/kg.)	19.73	11.45	32.64
Counterpart funding confirmed?			
National coordinating agency	Ministry of Environment and Forest		
Implementing agency	UNIDO	UNIDO	UNIDO

Secretariat's Recommendations			
Amount recommended (US $)	85,431	225,452	234,978
Project impact (ODP tonnes)	4.33	19.69	7.20
Cost effectiveness (US $/kg)	19.73	11.45	32.64
Implementing agency support cost (US $)	11,106	29,309	30,547
Total cost to Multilateral Fund (US $)	96,537	254,761	265,525

PROJECT DESCRIPTION

Sector background:

-	Baseline consumption of Annex A Group 1 substances (CFCs)*	6,681.0	ODP tonnes
-	Latest available total ODS consumption (1997)	7,884.5	ODP tonnes
-	Baseline consumption in the solvent sector (1991)	4,795	ODP tonnes
-	Latest available consumption in the solvent sector (1998)	3,364	ODP tonnes

*Baseline consumption of Annex A controlled substances refers to average of the consumption for the years 1995-1997

(a) Conversion of cleaning and coating processes based on CFC-113 to IPA and xylene at Microraj Electronics PVT Ltd. & RCC (Sales) PVT Ltd., Hyderabad (MRJ)

1. The objective of this project is to complete the phase out of the use of 4.33 ODP tonnes of CFC-113 at Microraj Electronics Pvt Ltd & RCC (Sales) Pvt Ltd, Hyderabad (MRJ). The CFC-113 is used to deposit a teflon coating on razor blades using an automated spray process. The CFC-113 is to be replaced by iso-propyl-alchohol (IPA) which is flammable. This requires new coating equipment and accessories, as well as fire prevention measures. Major cost items are a coating system (US $106,000), a loading and unloading system (US $16,500) and necessary auxiliary equipment (homogenisers, mixing tanks, fire-proof exhaust fans and automatic fire extinguishing systems, US $30,750). A small quantity of CFC-113 (0.48 ODP tonnes) is used for hand cleaning of equipment. It is being replaced with a non-ODS solvent with no capital costs. Solvent costs are significantly reduced, leading to operating savings. Because the consumption of the enterprise is low, the eligible grant is limited by the cost-effectiveness threshold to US $85,431.

Impact of the project on country's Montreal Protocol obligations.

2. The country programme indicated that in 1991, the solvent sector constituted 36% of the country's ODS consumption. When implemented as scheduled, consumption in the solvent sector will decrease by 4.33 ODP tonnes which will assist in maintaining 1999 freeze obligations.

(b) Conversion of cleaning and coating processes based on CFC-113 and CTC to processes based on IPA at Vidyut Metallics Ltd. (VML)

3. The objective of this project is to phase out the use of 17.5 ODP tonnes of CFC-113 and 2.2 ODP tonnes of carbon tetrachloride (CTC) at Vidyut Metallics Ltd, Thane (VML). The CFC-113 is used to deposit a teflon coating on razor blades using an automated spray process. The CFC-113 is to be replaced by iso-propyl-alchohol (IPA) which is flammable. This requires new coating equipment and accessories, as well as fire prevention measures. VML has finished one such installation and another is planned to complete the replacement of the original coating capacity of 7.96 million blades/day. A retroactive payment is requested for the investment made in 1995-1997. Major cost items requested in both cases are two coating systems (US $96,000 each), ancillary loading and unloading systems (US $16,500 each) and new fire-proof equipment (homogenisers, mixing tanks, fire-proof exhaust fans and automatic fire extinguishing systems).

Solvent costs are significantly reduced, leading to operating savings.

4. The electronic circuit cards of the machines used in the manufacture of blades are cleaned with carbon tetrachloride. It is also being replaced with IPA. There are no capital costs involved and slight operating savings.

Impact of the project on country's Montreal Protocol obligations.

5. When implemented as scheduled, consumption in the solvent sector will decrease by 19.7 ODP tonnes. Of this, 17.5 ODP tonnes is CFC-113 which will assist in maintaining 1999 freeze obligations.

(c) Conversion of cleaning processes from TCA and CTC to non-ODS solvent cleaning technologies (trichloroethylene and alkoxypropanol) at Videocon Group (VDC)

6. The objective of this project is to phase out of the use of 14.4 metric tonnes of CFC-113, 50 metric tonnes of 1,1,1-trichloroethane (TCA) and 2 metric tonnes of carbon tetrachloride (CTC), a total of 7.20 ODP tonnes, at Videocon International, Aurangabad (VDC). These solvents are used for the precision cleaning of parts for colour picture tubes, electronic components and plastic moulding equipment for the manufacture of television sets. For four of the cleaning applications the replacement solvent is a proprietary propanol-based solvent available from the Dow chemical company. For the fifth application the replacement is tricholoroethylene (TCE).

7. The major proposed investment cost is US$ 200,000 for two ultrasonic cleaning units with vacuum distillation for solvent recovery. Other proposed costs include the purchase of a high frequency ultrasonic cleaner (US$ 30,000), trials (US$ 10,000) and modification of two production lines for use with TCE (US$ 40,000).

Impact of the project on the country's Montreal Protocol obligations.

8. When implemented as scheduled 7.2 ODP MT of ODS will have been eliminated from the solvent sector. TCA and CTC are not Annex A, Group 1 substances so this project will not contribute to sustaining 1999 freeze limits.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

(a) Microraj Electronics

1. Several projects for manufacture of razor blades have been approved using similar technology to that proposed for MRJ. The eligibility of some of the capital cost items was

discussed with the implementing agency, UNIDO. It was agreed that an air filtering system installed with the first conversion was not essential for the conversion process and thus not eligible. Similarly, an automatic conveyor system represented a technological upgrade and was agreed as being eligible for compensation at 50 percent of the cost. By agreement, various other capital costs were adjusted for consistency with costs established as being incremental in the projects approved previously. These modifications do not affect the eligible level of grant which is limited by the cost effectiveness threshold of US $19.73 per kg for the CFC-113 sub-sector.

(b) Vidyut Metallics

2. Several projects for manufacture of razor blades have been approved using similar technology to that proposed for VML. The eligibility of some of the capital cost items was discussed with the implementing agency, UNIDO. It was agreed that an air filtering system installed with the first conversion was not essential for the conversion process and thus not eligible. Similarly, an automatic conveyor system represented a technological upgrade and was agreed as being eligible for compensation at 50 percent of the cost. By agreement, various other capital costs were adjusted for consistency with costs established as being incremental in the projects approved previously.

(c) Videocon Group

3. The eligibility of certain proposed capital costs were discussed with the implementing agency (UNIDO). In particular, one proposed cleaning machine (US $30,000) was found not to be eligible as the baseline involves cleaning by hand, and the Dow solvent proposed to be used can also be applied by hand. Other minor capital costs were adjusted on the basis of allowances in similar projects approved previously.

4. The eligible grant was calculated on the basis of the funding limit available for the TCA part of the project under the TCA threshold (US $38.5 per kg), plus the full eligible incremental costs for the CTC part for which there is no threshold. The CTC incremental costs comprised only IOC at a level of US $42,478.

RECOMMENDATION

1. The Fund Secretariat recommends blanket approval of the projects with associated support costs at the funding level shown in the table below:

	Project Title	Project Cost (US$)	Support Cost (US$)	Implementing Agency
(a)	Conversion of cleaning and coating processes based on CFC-113 to IPA and xylene at Microraj Electronics PVT Ltd. & RCC (Sales) PVT Ltd., Hyderabad (MRJ)	85,431	11,106	UNIDO
(b)	Conversion of cleaning and coating processes based on CFC-113 and CTC to processes based on IPA at Vidyut Metallics Ltd. (VML)	225,452	29,309	UNIDO
(c)	Conversion of cleaning processes from TCA and CTC to non-ODS solvent cleaning technologies (trichloroethylene and alkozypropanol) at Videocon Group (VDC)	234,978	30,547	UNIDO