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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-ninth Meeting
Beijing, 24-26 November 1999

PROJECT PROPOSALS: CHINA

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

Foam

• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Zhifu Zhenxing Polyurethane Materials Plant	UNDP
• Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible molded foam at Jizhou Beinei Automobile Cushion Plant	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Qingdao No. 10 Plastic Plant	UNDP
• Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible molded foam at Hebei Tianye Automobile Group Co. Ltd.	UNDP
• Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Hangzhou Fanlong Steering Wheel Co. Ltd.	UNDP
• Phase-out of CFC-11 by conversion to water blown technology in the manufacture of integral skin foam at Guangzhou Haohua Automobile Carpet Plant	UNDP
• Elimination of CFC-11 in manufacturing of PU rigid foam for insulation	UNIDO

at 31 enterprises	
• Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Ningxian Oriental Auto Parts Plant	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of flexible integral skin foam and flexible molded foam at Zhongqi Jinan Auto Parts Factory	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Taiyuan No. 2 Plastic Factory	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Anqiu Polyurethane Materials Factory	UNDP
• Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Dongfeng Automobile Body Company	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Harbin Dongguang Machinery Plant	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Fushan Anti-Corrosion Insulation Engineering Co. Ltd.	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Hanfeng Polyurethane Company	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Henan Bingxiong Refrigeration Truck Plant	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of PU rigid foam at Tianjin Relong Insulation Pipe Plant	UNDP
• Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Zhenjiang Feichi Automobile Group Co. Ltd.	UNDP
• Umbrella project for the phase-out of CFC-11 by conversion to water blown and HCFC-141b technologies in the manufacture of flexible integral skin foam at 4 small and medium-sized enterprises	UNDP
• Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology in Handan Huisheng Foam Plant	IBRD
• Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Hangxing Polyurethane Corporation	IBRD
• Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shanghai Furong Food Machinery Factory	IBRD
• Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology in Handan Fuxing Jiahe Foam Plant	IBRD

• Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Chengde Machinery Installation Co. Qinghuangdao Branch	IBRD
• Conversion of PU vertifoam manufacture from CFC-11 to liquid carbon dioxide technology in Tonxiang Shule Plastic Foam Plant	IBRD
• Conversion of PU slabstock manufacture from CFC-11 to methylene chloride and vertifoam from CFC-11 to liquid carbon dioxide technology at Shenzhou Foam Plant	IBRD
• Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Qianjin Polyurethane Corporation	IBRD
• Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Yangzhou Tongli Refrigeration Container Co. Ltd.	IBRD

Halon

• The halon sector - 2000 annual program	IBRD

Refrigeration

• Phasing out ODS at the Besco Domestic Refrigeration Compressor Factory in Beijing	UNIDO
• Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Moganshan Electric Appliances Co.	UNIDO
• Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Zhejiang Electrical Equipment Co.	UNIDO

PROJECT EVALUATION SHEET
CHINA

SECTOR: Foam ODS use in sector (1997): 16,987 ODP tonnes*

Sub-sector cost-effectiveness thresholds: Flexible US $6.23/kg

Project Titles:

(a) Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology in Handan Fuxing Jiahe Foam Plant
(b) Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology in Handan Huisheng Foam Plant
(c) Conversion of PU slabstock manufacture from CFC-11 to methylene chloride and vertifoam from CFC-11 to liquid carbon dioxide technology at Shenzhou Foam Plant
(d) Conversion of PU vertifoam manufacture from CFC-11 to liquid carbon dioxide technology in Tonxiang Shule Plastic Foam Plant

Project Data	**Flexible slabstock**	**Flexible slabstock**	**Flexible slabstock**	**Flexible slabstock**
	Handan Fuxing	**Handan Huisheng**	**Shenzhou**	**Tongxiang Shule**
Enterprise consumption (ODP tonnes)	136.67	129.00	134.90	80.00
Project impact (ODP tonnes)	136.67	129.00	134.90	80.00
Project duration (months)	36		36	36
Initial amount requested (US $)	515,970	522,207	609,616	498,400
Final project cost (US $):				
Incremental capital cost (a)	565,000	565,000	655,000	565,000
Contingency cost (b)	51,500	51,500	60,500	51,500
Incremental operating cost (c)	-100,530	-94,293	-105,884	-26,617
Total project cost (a+b+c)	515,970	522,207	609,616	589,883
Local ownership (%)	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%
Amount requested (US $)	515,970	522,207	609,616	498,400
Cost effectiveness (US $/kg.)	3.78	4.05	4.52	6.23
Counterpart funding confirmed?				
National coordinating agency	SEPA			
Implementing agency	IBRD			

Secretariat's Recommendations				
Amount recommended (US $)	515,970	522,207	609,616	498,400
Project impact (ODP tonnes)	136.67	129.00	134.90	80.00
Cost effectiveness (US $/kg)	3.78	4.05	4.52	6.23
Implementing agency support cost (US $)	66,757	67,443	77,058	64,792
Total cost to Multilateral Fund (US $)	582,727	589,650	686,674	563,192

* Net ODS consumption reported to be left in the foam sector.

PROJECT EVALUATION SHEET
CHINA

SECTOR: Foam ODS use in sector (1997): 16,987 ODP tonnes*

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

Project Titles:

(e) Umbrella project for the phase-out of CFC-11 by conversion to water blown and HCFC-141b technologies in the manufacture of flexible integral skin foam at 4 small and medium-sized enterprises
(f) Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Dongfeng Automobile Body Company
(g) Phase-out of CFC-11 by conversion to water blown technology in the manufacture of integral skin foam at Guangzhou Haohua Automobile Carpet Plant
(h) Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Hangzhou Fanlong Steering Wheel Co. Ltd.

Project Data	**Integral skin**	**Integral skin**	**Integral skin**	**Integral skin**
	4 SMEs	**Dongfeng**	**Guangzhou Haohua**	**Hangzhou Fanlong**
Enterprise consumption (ODP tonnes)	17.86	7.08	7.09	10.47
Project impact (ODP tonnes)	17.64	7.08	7.09	10.47
Project duration (months)	36	36	36	36
Initial amount requested (US $)	245,710	113,320	119,540	176,520
Final project cost (US $):				
Incremental capital cost (a)	280,000	50,000	90,000	118,000
Contingency cost (b)	28,000	5,000	9,000	11,800
Incremental operating cost (c)	151,440	56,120	57,900	63,350
Total project cost (a+b+c)	459,440	111,120	156,900	193,150
Local ownership (%)	**	100%	100%	100%
Export component (%)	0%	0%	0%	0%
Amount requested (US $)	245,710	111,120	119,540	176,520
Cost effectiveness (US $/kg.)	13.93	15.69	16.86	16.86
Counterpart funding confirmed?	Yes		Yes	Yes
National coordinating agency	SEPA			
Implementing agency	UNDP			

Secretariat's Recommendations				
Amount recommended (US $)	245,710	111,120	119,540	176,520
Project impact (ODP tonnes)	17.64	7.08	7.09	10.47
Cost effectiveness (US $/kg)	13.93	15.69	16.86	16.86
Implementing agency support cost (US $)	31,942	14,446	15,540	22,948
Total cost to Multilateral Fund (US $)	277,652	125,566	135,080	199,468

* Net ODS consumption reported to be left in the foam sector.
** One of the enterprises (Jinpan) has 50% local ownership. The other three have 100% local ownership.

PROJECT EVALUATION SHEET
CHINA

SECTOR: Foam ODS use in sector (1997): 16,987 ODP tonnes*

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

Project Titles:

(i) Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible molded foam at Hebei Tianye Automobile Group Co. Ltd.
(j) Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible molded foam at Jizhou Beinei Automobile Cushion Plant
(k) Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Ningxian Oriental Auto Parts Plant
(l) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of flexible integral skin foam and flexible molded foam at Zhongqi Jinan Auto Parts Factory

Project Data	**Integral skin**	**Integral skin**	**Integral skin**	**Integral skin**
	Hebei Tianye	**Jizhou Beinei**	**Ningxian**	**Zhongqi Jinan**
Enterprise consumption (ODP tonnes)	19.74	30.00	7.25	23.78
Project impact (ODP tonnes)	19.74	30.00	7.25	21.56
Project duration (months)	36	36	36	36
Initial amount requested (US $)	98,800	186,900	122,235	143,990
Final project cost (US $):				
Incremental capital cost (a)	30,000	60,000	98,000	124,000
Contingency cost (b)	3,000	6,000	9,800	12,400
Incremental operating cost (c)	65,800	418,040	59,350	99,730
Total project cost (a+b+c)	98,800	484,040	167,150	236,130
Local ownership (%)	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%
Amount requested (US $)	98,800	484,040	122,235	236,130
Cost effectiveness (US $/kg.)	5.01	16.13	16.86	10.95
Counterpart funding confirmed?		Yes	Yes	Yes
National coordinating agency		SEPA		
Implementing agency		UNDP		

Secretariat's Recommendations				
Amount recommended (US $)	98,800	484,040	122,235	236,130
Project impact (ODP tonnes)	19.74	30.00	7.25	21.56
Cost effectiveness (US $/kg)	5.01	16.13	16.86	10.95
Implementing agency support cost (US $)	12,844	62,925	15,891	30,697
Total cost to Multilateral Fund (US $)	111,644	546,965	138,126	266,827

* Net ODS consumption reported to be left in the foam sector.

PROJECT EVALUATION SHEET
CHINA

SECTOR: Foam ODS use in sector (1997): 16,987 ODP tonnes*

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

Project Titles:

(m) Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Hangxing Polyurethane Corporation
(n) Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Qianjin Polyurethane Corporation
(o) Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Chengde Machinery Installation Co. Qinghuangdao Branch
(p) Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shanghai Furong Food Machinery Factory
(q) Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Yangzhou Tongli Refrigeration Container Co. Ltd.

Project Data	**Rigid**	**Rigid**	**Rigid**	**Rigid**	**Rigid**
	Beijing Hangxing	**Beijing Qianjin**	**Chengde**	**Shanghai Furong**	**Yangzhou Tongli**
Enterprise consumption (ODP tonnes)	77.80	71.46	22.05	25.50	16.13
Project impact (ODP tonnes)	60.60	64.77	19.99	23.10	14.63
Project duration (months)	78	36	36	36	36
Initial amount requested (US $)	471,217	507,109	156,600	139,379	114,513
Final project cost (US $):					
Incremental capital cost (a)	55,000	80,000	135,000	50,000	90,000
Contingency cost (b)	5,500	8,000	13,500	5,000	9,000
Incremental operating cost (c)	410,717	432,354	70,655	84,379	68,246
Total project cost (a+b+c)	471,217	520,354	219,155	139,379	167,246
Local ownership (%)	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%
Amount requested (US $)	471,217	507,109	156,600	139,379	114,513
Cost effectiveness (US $/kg.)	7.78	7.83	7.83	6.03	7.83
Counterpart funding confirmed?					
National coordinating agency			SEPA		
Implementing agency			IBRD		

Secretariat's Recommendations					
Amount recommended (US $)			156,600	139,379	114,513
Project impact (ODP tonnes)			19.99	23.10	14.63
Cost effectiveness (US $/kg)			7.83	6.03	7.83
Implementing agency support cost (US $)			20,358	18,119	14,887
Total cost to Multilateral Fund (US $)			176,958	157,498	129,400

* Net ODS consumption reported to be left in the foam sector.

CHINA

SECTOR: Foam ODS use in sector (1997): 16,987 ODP tonnes*

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

Project Titles:

(r) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Hanfeng Polyurethane Company
(s) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Fushan Anti-Corrosion Insulation Engineering Co. Ltd.
(t) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Harbin Dongguang Machinery Plant
(u) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Henan Bingxiong Refrigeration Truck Plant
(v) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Anqiu Polyurethane Materials Factory

Project Data	**Rigid**	**Rigid**	**Rigid**	**Rigid**	**Rigid**
	Beijing Hanfeng	**Fushan**	**Harbin Dongguang**	**Henan Bingxiong**	**Shandong Anqiu**
Enterprise consumption (ODP tonnes)	55.80	75.33	63.00	62.50	69.20
Project impact (ODP tonnes)	56.30	54.40	57.11	56.30	63.50
Project duration (months)	36	36	36	36	36
Initial amount requested (US $)	440,830	425,950	447,170	440,780	497,200
Final project cost (US $):					
Incremental capital cost (a)	144,000	90,000	105,000	30,000	130,750
Contingency cost (b)	14,400	9,000	10,500	3,000	13,075
Incremental operating cost (c)	303,080	426,610	376,490	431,520	397,020
Total project cost (a+b+c)	461,480	525,610	491,990	464,520	540,845
Local ownership (%)	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%
Amount requested (US $)	440,830	425,950	447,170	440,780	497,200
Cost effectiveness (US $/kg.)	7.83	7.83	7.83	7.83	7.83
Counterpart funding confirmed?	Yes	Yes	Yes	Yes	Yes
National coordinating agency	SEPA				
Implementing agency	UNDP				

Secretariat's Recommendations					
Amount recommended (US $)	440,830		447,170		497,200
Project impact (ODP tonnes)	56.30		57.11		63.50
Cost effectiveness (US $/kg)	7.83		7.83		7.83
Implementing agency support cost (US $)	57,308		58,132		64,636
Total cost to Multilateral Fund (US $)	498,138		505,302		561,836

* Net ODS consumption reported to be left in the foam sector.

CHINA

SECTOR: Foam ODS use in sector (1997): 16,987 ODP tonnes*

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

Project Titles:

(w) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Qingdao No. 10 Plastic Plant
(x) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Zhifu Zhenxing Polyurethane Materials Plant
(y) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Taiyuan No. 2 Plastic Factory
(z) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of PU rigid foam at Tianjin Relong Insulation Pipe Plant
(aa) Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Zhenjiang Feichi Automobile Group Co. Ltd.
(bb) Elimination of CFC-11 in manufacturing of PU rigid foam for insulation at 31 enterprises

Project Data	**Rigid**	**Rigid**	**Rigid**	**Rigid**	**Rigid**	**Rigid**
	Shandong Qingdao	**Shandong Zhifu**	**Taiyuan No. 2**	**Tianjin Relong**	**Zhenjiang Feichi**	**31 enterprises**
Enterprise consumption (ODP tonnes)	41.25	39.20	18.00	13.13	35.00	776.40
Project impact (ODP tonnes)	38.12	36.25	16.32	11.90	31.73	707.30
Project duration (months)	36	36	36	36	36	30
Initial amount requested (US $)	298,480	276,880	127,790	93,190	245,020	5,538,245
Final project cost (US $):						
Incremental capital cost (a)	248,800	72,800	127,000	52,000	63,200	2,705,000
Contingency cost (b)	24,880	7,280	12,700	5,200	6,320	270,500
Incremental operating cost (c)	180,960	190,200	110,550	62,560	158,780	6,030,260
Total project cost (a+b+c)	454,640	270,280	250,250	119,760	228,300	9,005,760
Local ownership (%)	100%	100%	100%	100%	100%	100%
Export component (%)	0%	0%	0%	0%	0%	0%
Amount requested (US $)	298,480	270,280	127,790	93,190	228,300	5,538,245
Cost effectiveness (US $/kg.)	7.83	7.46	7.83	7.83	7.20	7.83
Counterpart funding confirmed?	Yes		Yes	Yes		Yes
National coordinating agency	SEPA					
Implementing agency	UNDP					UNIDO

Secretariat's Recommendations						
Amount recommended (US $)	298,480		127,790	93,190		
Project impact (ODP tonnes)	38.12		16.32	11.90		
Cost effectiveness (US $/kg)	7.83		7.83	7.83		
Implementing agency support cost (US $)	38,802		16,613	12,115		
Total cost to Multilateral Fund (US $)	337,282		144,403	105,305		

* Net ODS consumption reported to be left in the foam sector.

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1997)		90,511.1	ODP tonnes
- Baseline consumption* of Annex A Group I substances (CFCs)		57,818.2	ODP tonnes
- 1998 consumption of Annex A Group I substances		Not reported	
- Baseline consumption of CFCs in foam sector		Not reported	
- 1998 consumption of CFCs in foam sector		Not reported	
- Funds approved for investment projects in foam sector as of end of 1998	US $	44,259,833	
- Quantity of CFC to be phased out in foam sector as of end of 1998		10,174.2	ODP tonnes
- Quantity of CFC phased out as of end of 1998		4,637.1	ODP tonnes
- Quantity of CFC to be phased out in projects Approved in 1999 (27th and 28th Meetings)		2,499.9	ODP tonnes
- Funds approved for investment projects in the foam Sector in 1999 (27th and 28th Meetings)		11,026,097	ODP tonnes

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

1. UNIDO indicated that, in view of a great number of factories to be converted, the Government of China adopted the following strategy for the phase out of ODS in the sub-sector.

- to accelerate the process of the "in-depth" inventory exercise of the sector;
- based on the interim outcomes of the inventory and in cooperation with the implementing agencies to continue the current practice to address the selected individual or group factories under the relevant projects in 2000-2002. During this three year period approximately 1,000 tonnes of ODP per year will be covered by the individual or group projects with estimated cost to the Multilateral Fund of US $7.5 million per year;
- to finalize the inventory process by mid 2001 and by the end of 2001 to elaborate a detailed strategy plan for ODS phase out from the PU sub-sector;
- in order to maintain the current practice of the factories' operation at their production premises as well as to provide spray foaming services for clients "on-spot" no reduction of the existing number of foaming units will be foreseen by the individual or group projects to be submitted in 2000-2002 for this sector. The concept of the "industrial rationalization" will be applied at the later state of the ODS phase out from the PU sub-sector for the umbrella and terminal umbrella projects in line with the Decision 25/50. It is also expected that some additional guidance documents for ODS phase out from the SME sectors will be prepared and adopted by the Executive Committee.

FLEXIBLE SLABSTOCK FOAM PROJECTS

Handan Fuxing Jiahe, Handan Huisheng, Shenzhou Foam Plant and Tongxiang Shule

2. The four enterprises manufacture flexible slabstock polyurethane foam for furniture applications using CFC-11. The consumption of CFC-11 of the enterprises in 1998 ranged from 80 ODP tonnes to 137 ODP tonnes. Their total consumption was 481.57 ODP tonnes which will be phased out with the use of liquid carbon dioxide (LCD) by all the enterprises and methylene chloride on a second production line at the Shenzhou Plant.

3. Three of the enterprises (Handan Fuxing, Handan Huisheng and Shenzhou) operate Maxfoam, while the fourth enterprise operates a Vertifoam. Shenzhou also has a vertifoam as a second line. The incremental capital cost of each project relates to the cost of the LCD technology (US $480,000), licence fee (US $50,000), trial (US $15,000) and technical assistance (US $20,000). The incremental capital cost of the conversion to methylene chloride includes methylene chloride storage tank and metering unit (US $35,000) ventilation (US $10,000) and sprinkler system (US $40,000).

Impact of the Projects

4. The four projects will eliminate 481.57 ODP tonnes of CFC-11. This constitutes 0.8 % of China's baseline consumption of Annex A Group I substances.

INTEGRAL SKIN FOAM PROJECTS

Dongfeng Automobile, Guangzhou Haohua, Hangzhou Fanlong Steering, Hebei Tianye, Jizhou Beinei, Ningxian Oriental and Zhongqi Jinan

5. Three of the enterprises (Dongfeng, Ningxian Oriental and Hangzhou Fanlong) manufacture steering wheels, while two (Jizhou Beinei, and Hebei Tianye) manufacture flexible molded seat cushions for the automobile industry. Jinan produces both steering wheels and seat cushions. The consumption of CFC-11 in 1998 of the enterprises ranged from 7-30 ODP tonnes with total consumption of 105.41 ODP tonnes. All the enterprises have 100% national ownership except Sichuan Mianyang Jinpan which is 50% nationally owned.

6. The production of the steering wheels will be converted to water-blown technology by all the enterprises except Zhongqi Jinan Auto Parts. Similarly, the production of flexible molded seat cushions will be converted to water-blown except Zhongqi Jinan. In both production of integral skin steering wheels and flexible molded seat cushions, Zhongqi Jinan will convert to the use of HCFC-141b.

7. All the enterprises except Jizhou Beinei and Ningxian Oriental use low or high pressure foaming machines of various capacities. Jizhou Beinei and Ningxian Oriental use manual operations. The incremental capital costs of the projects include retrofit of the foam machines, replacement of the manual operations with high pressure machines (at US $80,000 with company contribution of US $40,000 for technology upgrade), mold modifications at US $2,000 per mold, replacement of some of the mixheads of high pressure dispensers (US $20,000), in-mold coating

machine (US $5,000 each), ventilation (US $6,000), technology transfer, training and trials at an average of US $30,000 per enterprise. There are incremental operating costs resulting from the higher cost of new chemicals.

Umbrella project 4 small and medium-sized enterprises

8. The umbrella project (4 SMEs) includes the following enterprises whose background information is given in the table below.

Enterprise	Year Established	Consumption of CFC-11 (ODP tonnes) 1998	Products	Substitute Technology	Project Cost US $	Eligible Grant
Ningbo Yongling Rubber & Plastic Corporation	1984	4.5	Gear knobs, arm rests	Water	166,180	75,870
Sichuan Mianyang Jinpan Automobile Parts Co. Ltd.	1993	6.48	Steering wheels	Water	115,110	54,626
Zhenjiang Xingda Auto Parts General Plant	1994	4.48*	Steering wheels	Water	118,820	75,533
Beijing Automobile Steering Wheel Plant	1958	2.4*	Steering wheels	HCFC-141b	113,230	40,464
Total		17.86				246,493

*** 3 year average.**

9. The enterprises operate low and high pressure foam dispensers ranging from 2 kg/min - 40 kg/min in output. The incremental capital costs include the replacement of the 2 kg/min machine (US $40,000), replacement of the mixing heads of two high pressure machines with L-head (US $20,000), retrofit of two dispensers, cost of providing ventilation for in-mold coating spray (US $6,000), in-mold coating machine (US $5,000 each), mold modification, technology transfer, training and trials (US $30,000). There are incremental operating costs due to higher cost of chemicals.

Impact of the Integral Skin Foam Projects

10. The integral skin projects will eliminate 120.69 ODP tonnes when implemented. This represents 0.2% of China's baseline consumption of Annex A Group I substances. There will be residual ODP of 2.58 ODP tonnes resulting from the use of HCFC-141b.

RIGID POLYURETHANE FOAM PROJECTS

31 enterprises (umbrella project).

11. The 31 enterprises in the umbrella project consumed a total of 776.4 ODP tonnes (average 1996-1998). The project will phase out 707.3 tonnes. The factories included in the project produce rigid polyurethane foam for various applications including spray insulation foam, sandwich panels and boards for construction of cold rooms and pipe sections and pipe-in-

pipe applications. The use of low pressure locally made spray foam machines of output of 3-12 kg/min and locally made low pressure foaming machines of output 30-120 kg/min are the predominant equipment used by the companies. Four of a total of 74 machines used by the enterprises were installed between 1996 and 1998, 24 were installed between January and May 1995 and the rest between 1984 and 1994.

12. All the enterprises will convert to the use of HCFC-141b. The main item of the incremental capital costs of the projects is the cost of replacement of 49 locally low pressure sprayfoam machines with high pressure machines at the cost of US $25,000 each. Other items of capital cost include retrofit of 8 high pressure sprayfoam machines (Glas-Craft Mini II) at US $10,000, mold modification at 9 enterprises at US $10,000 each, technology transfer at US $10,000, trials US $5,000-US $10,000 and training (US $5,000-US $10,000) per enterprise. Incremental operating costs relate to higher cost of chemicals and 7.5% increase in foam for dimensional stability.

13. The profile of the enterprises in the umbrella projects is provided as Annex I to this evaluation.

OTHER RIGID POLYURETHANE FOAM PROJECTS

Beijing Hanfeng, Beijing Hangxing, Beijing Qianjin, Chengde Machinery, Fushan Anti-Corrosion, Harbin Dongguang, Henan Bingxiong, Shandong Anqiu, Shandong Qingdao No. 10, Shandong Zhifu Zhenxing, Shanghai Furong, Taiyuan No. 2, Tianjin Relong Insulation, Yangzhou Tongli and Zhenjiang Feichi

14. In addition to the umbrella project consisting of 31 enterprises projects for 15 other rigid polyurethane foam producing enterprises (listed above) have been submitted. The total consumption of CFC-11 of the 15 enterprises is 652.28 ODP tonnes. The consumption of the individual enterprises range from 13.13 ODP tonnes to 77.8 ODP tonnes (see Project Evaluation Sheet). A total of 561.31 ODP tonnes will be phased out from the 15 projects.

15. The enterprises manufacture rigid polyurethane spray foam, sandwich panels for cold storage and refrigerated trucks and containers, and foamed pipes for food processing, district heating and petroleum industry.

16. The enterprises operate locally made low pressure dispensers, locally made sprayfoam machines as well as imported sprayfoam machines, mainly Glas-Craft Mini II. These enterprises (Harbin Dongguang, Shandong Qingdao and Yangzhou Tongli) use a number of high pressure machines. One enterprise (Shandong Anqiu Polyurethane Materials Factory) uses hand mix operations for manufacturing some of its products.

17. All the enterprises will convert their production to the use of HCFC-141b. The incremental capital cost of the projects include the cost of replacement of the low pressure foam machines with high pressure dispensers at an average cost of US $80,000 and of locally made sprayfoam machines and in some cases the Glas-Craft Mini II and similar sprayfoam machines for high pressure foam dispensers at US $25,000 each. The incremental capital costs also include retrofit of the high pressure dispensers at a cost of US $10,000-US $45,000 depending on

the make of the dispensers, retrofit of some of the sprayfoam machines at an average cost of US $10,000, technology transfer, trials and training at an average cost of US $30,000.

18. The incremental operating cost relate to the higher cost of chemicals after conversion and in four cases the cost attributed to 10%-15% increase in density of the HCFC-141b based foam. The companies are Beijing Hangxing (sprayfoam, 10%), Beijing Qianjin (sprayfoam, 10%), Fushan Anti-corrosion (sprayfoam, 15%) and Henan Binxiong (boxfoam, 15%).

Impact of the Projects

19. When the rigid foam projects are approved and implemented 1,268.61 ODP tonnes of CFC-11 will be eliminated by the 46 enterprises. This represents about 2.2% of China's baseline consumption of Annex A Group I substances. There will be residual consumption of 90.97 ODP tonnes as a result of the use of HCFC-141.

Cumulative Impact of the Projects

20. All the foam projects will phase out 1,914.58 ODP tonnes which constitutes 3.3% of China's baseline consumption of Annex A Group I substances.

21. If the foam projects are approved the amount of CFCs that will be phased out from projects approved in the foam sector in 1999 will be 4,414.51 tonnes. This will be 7.6 % of China's baseline consumption of Annex A Group I substances. However this total of 4,414.51 ODP tonnes to be phased out in 1999 will be 26% of the total consumption in the foam sector reported to be remaining to be phased out. There will be residual ODP of 151.58 ODP tonnes as a result of the use of HCFC-141b.

Justification for the use of HCFC-141b

22. A letter advising of the Government decision to use HCFC technology has been received by the Secretariat in accordance with Executive Committee decision 27/13 and is attached to this evaluation together with the information and commitments from the enterprises.

Project Implementation Time Frame

23. While UNIDO proposes to implement the umbrella rigid foam project for 31 enterprises in 30 months, UNDP and the World Bank will implement their projects in 36 months.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Flexible Slabstock Foam Projects

1. The Secretariat and the World Bank discussed the projects and agreed on the costs.

Integral Skin foam Projects

2. The Secretariat and UNDP discussed the projects and agreed on their costs.

Rigid Foam Projects

3. The three implementing agencies, UNDP, UNIDO and the World Bank, submitted projects in this sub-sector. The Secretariat and the implementing agencies discussed the rigid foam projects and agreed to the costs of the following projects: Harbin Dongguang, Shanghai Furong, Tianjin Relong and Yangzhou Tongli.

4. Issues relating to the cost of new high pressure spray foam machines as well as the cost of retrofit of existing high pressure sprayfoam machines, issues which affect most of the remaining projects, are still under discussion between the Secretariat and the implementing agencies. The conclusions of the discussions will be communicated to the Sub-Committee on Project Review. However it was determined that for some of the affected companies the conclusions of the discussions will not affect their eligible grants since they are at the threshold limit. In such cases it was agreed that the projects be given blanket approval, but any agreed prices will apply to them during project implementation. These projects are Beijing Hanfeng, Chengde Machinery, Shandong Anqiu, Shandong Qingdao,Taiyuan and Tianjin Relong. For the other affected projects (Shandong Zhifu, Zhenjiang Feichi, and the SME project for 31 enterprises) the eligible grants will be determined following conclusions of the discussions.

5. In three sprayfoam projects (Hianxing, Bingxiong, Fushan) where low densities (30-35 kg/m^3) of CFC-based foam are claimed, and one project (Qianjin) where no density is indicated, cost of 10-15% of additional foam has been added to the incremental operational cost as the compensation for increase in density needed during conversion to HCFC-141b. These additional costs ranging from US $123,450 to US $166,135 represent increases of 42-63% in the operational costs of the companies. The Secretariat has been informed that for spray foam applications the industry norm for achieving CFC-based rigid spray foam of standard quality is to blow the foam at densities higher than 38 kg/m3, i.e. higher than the densities stated in the projects. No reasons or justifications are given for producing foams of such densities for the stated applications, namely construction, district heating, truck bodies and cold storage.

6. Consequently, in all the above cases the Secretariat could not recommend the additional operational costs associated with increase in density as eligible incremental costs, but rather that the eligible incremental operational cost should be the cost based on the differences between chemical usage and the associated prices before and after conversion. These are provided below for the four companies.

Project	Eligible IOC US $
Bingxiong	264,685
Fushan	276,932
Hiangxing	285,358
Qianjin	304,393

The operational costs with the additional costs for increase in density are as follows: Bingxiong: US $431,520, Fushan: US $426,610, Hiangxing: US $408,807 and Qianjin: US $432,354.

7. The four projects are submitted for individual consideration on account of this issue.

SME for 31 Enterprises

8. The Secretariat and UNIDO are still discussing some of the items of the incremental capital costs, including the cost of spraying machines, retrofit costs and costs of technology transfer and training.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of all four flexible slabstock foam projects, namely Handan Fuxing Jiahe, Handan Huisheng, Shenzhou Foam Plant and Tongxiang Shule with the funding level and associated support costs indicated in the table below. It also recommends blanket approval of all eight integral skin foam projects, namely the Umbrella project for 4 SMEs, Dongfeng, Guangzhou Haohua,Hangzhou Fanlong, Hebei Tianye, Jizhou Beinei, Ninxiang and Zhongqi Jinan, and the following rigid foam projects: Beijing Hanfeng, Chengde Machinery, Harbin Dongguang, Shanghai Furong, Shandong Anqiu, Shandong Qingdao, Taiyuan, Tianjin Relong and Yangzhou Tongli with the funding level and associated support costs indicated in the table below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(a)	Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology in Handan Fuxing Jiahe Foam Plant	515,970	66,757	IBRD
(b)	Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology in Handan Huisheng Foam Plant	522,207	67,443	IBRD
(c)	Conversion of PU slabstock manufacture from CFC-11 to methylene chloride and vertifoam from CFC-11 to liquid carbon dioxide technology at Shenzhou Foam Plant	609,616	77,058	IBRD
(d)	Conversion of PU vertifoam manufacture from CFC-11 to liquid carbon dioxide technology in Tonxiang Shule Plastic Foam Plant	498,400	64,792	IBRD
(e)	Umbrella project for the phase-out of CFC-11 by conversion to water blown and HCFC-141b technologies in the manufacture of flexible integral skin foam at 4 small and medium-sized enterprises	245,710	31,942	UNDP
(f)	Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Dongfeng Automobile Body Company	111,120	14,446	UNDP
(g)	Phase-out of CFC-11 by conversion to water blown technology in the manufacture of integral skin foam at Guangzhou Haohua Automobile Carpet Plant	119,540	15,540	UNDP
(h)	Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Hangzhou	176,520	22,948	UNDP

	Fanlong Steering Wheel Co. Ltd.			
(i)	Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible molded foam at Hebei Tianye Automobile Group Co. Ltd.	98,800	12,844	UNDP
(j)	Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible molded foam at Jizhou Beinei Automobile Cushion Plant	484,040	62,925	UNDP
(k)	Phase-out of CFC-11 by conversion to water blown technology in the manufacture of flexible integral skin foam at Ningxian Oriental Auto Parts Plant	122,235	15,891	UNDP
(l)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of flexible integral skin foam and flexible molded foam at Zhongqi Jinan Auto Parts Factory	236,130	30,697	UNDP
(m)	Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Hangxing Polyurethane Corporation			IBRD
(n)	Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Qianjin Polyurethane Corporation			IBRD
(o)	Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Chengde Machinery Installation Co. Qinghuangdao Branch	156,600	20,358	IBRD
(p)	Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shanghai Furong Food Machinery Factory	139,379	18,119	IBRD
(q)	Phase out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Yangzhou Tongli Refrigeration Container Co. Ltd.	114,513	14,887	IBRD
(r)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Beijing Hanfeng Polyurethane Company	440,830	57,308	UNDP
(s)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Fushan Anti-Corrosion Insulation Engineering Co. Ltd.			UNDP
(t)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Harbin Dongguang Machinery Plant	447,170	58,132	UNDP
(u)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Henan Bingxiong Refrigeration Truck Plant			UNDP
(v)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Anqiu Polyurethane Materials Factory	497,200	64,636	UNDP
(w)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Qingdao No. 10 Plastic Plant	298,480	38,802	UNDP
(x)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Shandong Zhifu Zhenxing Polyurethane Materials Plant			UNDP
(y)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Taiyuan No. 2 Plastic Factory	127,790	16,613	UNDP
(z)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of PU rigid foam at Tianjin Relong Insulation Pipe Plant			UNDP

(aa)	Phase-out of CFC-11 by conversion to HCFC-141b technology in the manufacture of rigid polyurethane insulation foam at Zhenjiang Feichi Automobile Group Co. Ltd.			UNDP
(bb)	Elimination of CFC-11 in manufacturing of PU rigid foam for insulation at 31 enterprises			UNDIO

CHINA
PROJECT DESCRIPTION

(a) The Halon Sector 2000 Annual Program

2. In accordance with the Executive Committee approval of the Sector Plan for Halon Phaseout in China (UNEP/Ozl.Pro/ExCom/23/68), China is requesting release of the third tranche of US$10.6 million for implementation of the year 2000 Annual Program. With this funding, China halon 1211 production will be reduced to a maximum of 3,980 MT and its consumption to a maximum of 3,580 MT in 2000. The halon 1301 production will be maintained at the agreed maximum level of 618 MT and consumption will be 300 MT. Details of the annual programme are provided in the request submitted by the World Bank as included in Annex I.

3. From the initial 14 Halon plants, halon 1211 production is now only produced at 6 halon production plants. 8 halon 1211 production plants have been closed and dismantled completely and production and capacity has been reduced at four other halon 1211 production plants. Closure of extinguisher manufacturing and conversion of production of halon fire extinguishers and manufacturing of fire extinguishing systems to non ODS substitutes are underway at 27 enterprises out of a total of 88 halon fire fighting equipment companies. A total of 11 technical assistance activities have started, ranging from activities to strengthening the implementation capacity, preparation of standards to ensure quality and reliability of non-halon fire extinguishers and fire extinguishing systems. To ensure that sufficient alternatives are availbe to replace halon use, special initiatives have been taken to strengthen the supply of ABC powder, foam and CO_2 cylinders. Contracts have been signed for setting up an ABC dry powder plant and a feasibility study has been undertaken to assess the financial and technical parameters of setting up the production of light weight CO_2 cylinders.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. Decision 23/11 established a schedule of production and consumption reductions for the duration of the China Halon Phase-out project through the year 2010.

Production target

2. The implementation of the first year of the China halon project resulted in a greater decrease in production (6.8 per cent below the maximum allowable production) and exports than required under China's agreement with the Executive Committee as contained in Decision 23/11. Under the agreement, consumption is defined according to the Montreal Protocol's definition, i.e., consumption = production + imports – exports.

Consumption target

3. China exceeded its consumption target for 1998 (7160 MT) by 149 MT (447 ODP tonnes) due to a reduced level of exports. China and the World Bank have developed an export quota system to prevent this from recurring in the future.

4. According to the performance indicators for the 1998 work programme, China was to phase-out the halon consumption of 20 fire extinguisher manufacturers in 1998. The Bank reported that two fire extinguisher manufacturers stopped using halon in 1998.

5. The 1998 work programme also indicated that two fixed system manufacturers were converted or closed in 1998. Neither manufacturer converted or closed in 1998.

Technical audit

6. Paragraph C of Decision 23/11 requires that the payments in respect of each annual programme are conditional from 2000 onwards on the Executive Committee receiving satisfactory confirmation that reductions have been made in accordance with the schedule in Paragraph A and the requirements of paragraph (F) for the year two years prior to the year to which the annual programme relates (e.g. confirmation of the 1998 level to determine funding for the year 2000).

7. The Bank indicated that an audit of the 1998 Annual Programme was completed by the China National Audit Agency. The Secretariat requested a copy of the audit. The Bank indicated that the report was in Chinese and needed to be translated. As of this writing, the Secretariat has not received either the Chinese or English version of the technical audit.

Agency fee

8. The World Bank is requesting a 10 per cent agency fee for this project. The Bank provided information on its administrative costs for 1998 to the 28th Meeting that was included in UNEP/OzL.Pro/ExCom/28/54, Part C. At its 28th Meeting and in the light of the discussion on the aforementioned report, the Executive Committee decided to request the World Bank to give further clarification on the figure of three per cent for the financial intermediary fee to the 29th Meeting of the Executive Committee. The report on the financial intermediary fee is included in UNEP/OzL.Pro/ExCom/29/60.

RECOMMENDATION

1. The Executive Committee may wish to take the above into consideration in its determination of the approval of the 2000 work programme and the level of the agency fee for the World Bank.

Annex I

THE HALON SECTOR

2000 ANNUAL PROGRAM

August 5, 1999

TABLE OF CONTENTS

The Halon Sector
2000 Annual Program

BACKGROUND

In accordance with the Executive Committee approval of the Sector Plan for Halon Phaseout in China (UNEP/Ozl.Pro/ExCom/23/68), China is hereby requesting release of the third tranche of **US$10.6 million** for implementation of the year 2000 Annual Program. With this funding, China halon 1211 production will be reduced to a maximum of **3,980 MT** and its consumption to a maximum of **3,580 MT** in 2000. The halon 1301 production will be maintained at the agreed maximum level of **618 MT** and consumption will be **300 MT**. Details of the annual program are in Part C.

Since the approval of the China Halon Sector Strategy at the 23rd meeting of the ExCom and release of funds for the first (1998) Annual Program, China has started implementation of the Halon Sector Strategy. Since the start of the program, China has developed supporting policies and regulations. From the initial 14 Halon plants, halon 1211 production is now only produced at 6 halon production plants. 8 halon 1211 production plants have been closed and dismantled completely and production and capacity has been reduced at four other halon 1211 production plants. Closure of extinguisher manufacturing and Conversion of production of halon fire extinguishers and manufacturing of fire extinguishing system to non ODS substitutes are underway at 27 enterprises out of a total of 88 halon fire fighting equipment companies. A total of 11 technical assistance activities have started, ranging from activities to strengthening the implementation capacity, preparation of standards to ensure quality and reliability of halon substitute fire extinguishers and fire extinguishing systems. The national production quota for halon 1211 for 1999 is **5,970 MT**, a reduction of **1,942 MT** from the production quota of **7,912 MT** in 1998. A reduction of **5,674 MT** halon 1211 since the start of the program. Production of halon 1301 has been capped at 618 MT, equal the halon 1301 production level in 1997. Detailed implementation status is described in Part A.

Those results have been achieved through close cooperation between State Environmental Protection Administration (SEPA), the Ministry of Public Security (MPS), China National Chemical Construction Corporation (CNCCC) and the fire fighting enterprises. Experiences from the implementation have also confirmed the necessity of strong policy enforcement and monitoring of the halon phaseout program. Due to the number of enterprises involved and the geographical distribution, the success of the program depends to a large extent on the cooperation and support from the provincial Environmental Protection Bureaus and Fire Fighting Bureaus, hence training and public awareness are key elements.

While halon phaseout is one side of the equation, the assured supply of alternative fire extinguishing agents and fire fighting equipment in sufficient quantities and qualities is required. With a rapid decline of halon 1211 supply, special initiatives have been taken to strengthen the supply of ABC powder, foam and CO_2 cylinders. Contracts have been signed for setting up an ABC dry powder plant and a feasibility study has been undertaken to assess the financial and technical parameters of setting up the production of light weight CO_2 cylinders.

Part A Implementation Status Of Previous Annual Program

Status of 1998 Annual Program

Phaseout targets and objectives

Halon	1998		1997	
	Production	**Consumption**	**Production**	**Consumption**
1211	**7,912MT**	**7,160MT**	**11,644MT**	**10,849MT**
1301	**618MT**	**300MT**		

The actual ODP impact of the 1998 Annual program is **11,196 MT ODP** reduction in production and **11,067 MT ODP** reduction in consumption.

Implementation of policy instruments

The production quota regulation was effective by December, 1997. The national 1998 halon quota was issued and each producer was assigned a halon 1211 production quota and one producer was assigned the halon 1301 production quota. The data reported by the producers was verified by SEPA and MPS and has been audited by the State Auditing Agency and found accurate.

Enterprise-level phaseout activities

Closure and conversion of halon production facilities and fire extinguisher manufacturers

All contracts were signed with bid winners and all producers involved in the 1998 program had stopped halon production by January 1, 1998. Their production facilities were dismantled and equipment was completely destroyed by March 1998. Details are in Annex I.

All the conversion projects are progressing in accordance with the agreed time schedules and most of the conversions will be completed in the second half of 1999. Details are in Annex II.

Technical Assistance Activities

Consulting companies for the TA activities have been selected through a bidding process. All TA projects are proceeding in accordance with the agreed implementation plan. The three standards which have been drafted and circulated for technical review. The Halon Management Plan is under development but there are some uncertainties about the demand for halon in the upcoming years as the educational efforts of the fire fighting bureaus and the availability of suitable alternatives seem to be having a greater affect on demand than earlier expected. The export/import study have been completed and a draft has been circulated for review. This study provides information on the present situation regarding import/export monitoring and includes a proposal for setting up an import/export licensing system. Details are in Annex III.

Status of 1999 Annual Program

Phaseout targets and objectives

The phaseout target for the 1999 Annual Program is to reduce halon 1211 production from the level of **7,912 MT** to a maximum of **5,970 MT** and consumption to a maximum of **5,370 MT** and to maintain halon 1301 production at **618 MT** and consumption remain at **300 MT**.

A main objective of the Halon Sector Plan is to ensure that the level of fire protection is not compromised through halon phaseout activities and substitutes are available in sufficient quantities and qualities.

Implementation of policy instruments

The quota system is the main tool for the implementing the halon phaseout and is supported fully by MPS. MPS has simultaneously strengthened its enforcement of the regulation on use of halon 1211 fire extinguishers, which further has reduced the demand for halon 1211.

Enterprise-level phaseout activities

Closure of halon production facilities

Contracts were signed with 4 bid winners. Total halon 1211 quota reduction was 1,942 MT from the 7,912 MT level meeting the 1999 national halon 1211 quota requirement. All producers had stopped halon production before January 1, 1999. Their production facilities were dismantled and equipment was completely destroyed by March 1999. Until now, 2 closure projects have been jointly verified and accepted by SEPA and MPS and 2 other projects will be verified in August of 1999. Details are in Annex I.

Closure & Conversion of halon fire extinguisher manufacturers

Contracts were signed with 11 halon extinguisher manufacturers selected through a bidding process with a reduction of halon 1211 consumption of 1,317 MT. In this program, 2 extinguisher manufacturers selected closure and other 9 selected conversion. The 2 closure projects have completed the dismantling of their equipment. All the conversion projects are in the process of equipment procurement. Details are in Annex II.

Special initiatives

The shortage of ABC powder of sufficient quantities and qualities has become a problem. Meanwhile, in the first two implementation years of the Halon Sector Phaseout Plan, about 6,000 MT of halon 1211 will be phased out, thus there will be a great demand for halon substitutes in the market. To guarantee fire fighting capacity in China, it is necessary to establish an additional ABC dry powder production line with an annual capacity of 3000 MT. MPS has already signed a contract for setting up a new ABC powder plant in China based on US technology.

The need for light weight high pressure CO_2 cylinders is another concern which has been addressed in the 1999 Annual Program and will continue on through the 2000 Annual Program. Currently domestically manufactured CO_2 fire extinguishers do not meet international standards in terms of production technology and the quality of the steel. With the increased need for high pressure steel cylinders, quality and excess weight need to be addressed. A feasibility study was

carried out as part of the 1999 annual program to examine the possibility of establishing the production of light weight CO_2 cylinders.

Technical Assistance Activities

- Contract have ben signed for all 1999 TA activites . SEPA and MPS will continue monitoring the implementation of all TA projects to assure projects are carried out as scheduled an dprovide the expected outcome.

PART B

2000 ANNUAL PROGRAM

Objectives

The phaseout target for the 2000 Annual Program is to reduce halon 1211 production from the level of **5,970 MT** to a maximum of **3,980 MT** and consumption to a maximum of **3,580 MT** and to maintain halon 1301 production at **618 MT** and consumption remain at **300 MT**. The 2000 program will also continue actions to ensure that the fire fighting capacity is not undermined as the result of an insufficient supply of substitutes of satisfactory quality.

China is requesting the release of the approved amount of US$ 10.6 million for the 2000 Annual Program as agreed in the overall Halon Sector Phaseout Plan. To achieve these goals, following activities are envisioned:

(a) **US$4 million** to be used for buying back quotas and as a result closing 3-5 halon agent producers;
(b) **US$5.3 million** to be used for closing and converting 10-15 fire extinguisher manufacturers;
(c) **US$0.4 million** to be used for converting 2-3 fire extinguishing system manufacturers; and
(d) **US$0.9 million** to be used for technical assistance activities in order to support the halon phaseout program and ensure that existing fire protection requirements can be met..

Policy instruments during the Year

Policies continue

1. In 2000, the following policies and measures will continue to be implemented by the Government. These policies are considered necessary for the success of a total halon phaseout in China.

(a) Bidding -- The bidding system will continue to be improved based on the experiences gained from the 1998 and 1999 Annual Programs. Preparatory work will be finished in the second half of 1999. Bidders with the highest scores will be awarded grant funds after bid evaluation. The Government will sign closure/conversion contracts with the winning enterprises.

(b) Tradable production quota – The regulation will be implemented as in 1998 and 1999.

(c) Strengthening of the ban on new installations of halon extinguishers for non-essential uses and a gradual tightening of the definition of essential uses.

In order to support local enforcement of the ban on non-essential uses of halons in the most effective manner, the Government will ensure that:

- SEPA/MPS will disseminate details of the ban to all prospective consumers through various channels (news media, bulletin, propaganda, etc.);

- Local fire bureaus and environmental protection bureaus will jointly inspect consumers on a regular basis. If any consumer is found to be using the newly-installed halon fire extinguishers in non-essential areas, the consumer will be required to change within a definite time.
- Joint inspection teams of the local fire bureaus and environmental protection bureaus will be required to submit regular reports to MPS and NEPA about the situation and measures in implementation of the ban.
- Strict control of the sale of halons by implementing the project of two demonstration centers and spreading the experience to other provinces in order to reach phaseout goals.

Enterprise-level activities

Through the production quota and bidding systems, bid winners will be granted funds for closure and conversion activities. All contracts for closures are expected to be signed by the end of 1999. Closure projects (for halon agent producers) are expected to take effect from January 1, 2000 and all the closure projects to be completed within the program year. All contracts for conversion projects are expected to be signed in the first three months of 2000 and implementation will start afterwards. Implementation may take up to 2 years.

Technical assistance (TA) activities

TA activities envisioned under the Sector Phaseout Plan concentrate on strengthening: (i) the overall institutional framework, (ii) management, monitoring & evaluating capabilities of participating institutions, (iii) technical personnel involved in halon phaseout activities, and (iv) support development and facilitate use of alternative technology. These are essential to the success of the phaseout objectives. The main TA activities in 2000 include:

1) Design Code for Water Mist Fire Extinguishing Systems

As an alternative technology for halon fire extinguishing systems, water mist systems provide a performance and cost effective alternative to halon systems. Abroad, water mist systems have been gaining acceptance in many industrial and commercial fire protection applications. Earlier work in China consisted of developing a fire test which can now serve as the basis for a design code. The development of the design code for water mist systems is necessary to provide this attractive, cost and performance effective alternative to halon systems..

2) National Standard for the Performance Requirements and Test Methods for Components for Water Mist Fire Extinguishing Systems"

In China, it is required that the quality of fire protection systems be confirmed by a national quality monitoring department. There are some water mist products imported from foreign countries that have passed quality tests in national test centers. But, these tests are based upon requirements provided by examinees, such as ISO standards and / or a proprietary company standard. Based on the Chinese fire codes, the tests for all fire protection products must meet the requirement of a national standard. The products, which are tested only in accordance with international and / or other foreign standards, technically are not approved to enter the fire protection market in China and their use is limited to demonstration projects. Formulating the national standard is important for the application of water mist systems in China .

3) Public Awareness for the Halon Sector Approach and Halon Alternative Technology

Since China joined Montreal protocol, the publicity campaign to develop public awareness of the phaseout of ODS has been quite successful. In the fire protection sector, some information tools, which are the products of the halon management plan in the 1998 TA activities of the Halon Sector Approach have been developed. Although there are a lot of materials and activities available for spreading public awareness of the halon phaseout program in China, the main focus of these materials and activities has been on relevant people engaged in the fire protection sector and in 2-3 large cities and a province. Expanding the public awareness campaign to the entire country and incorporating the new halon alternative technologies are important to expand the halon phaseout in China.

4) Design Code for Dry Powder Fire Extinguishing Systems

Another alternative to halon systems for use on applications where water and gaseous extinguishing systems are not appropriate is the dry powder system. This type of system is especially valuable in low temperature applications where water would freeze and in petroleum, petrochemical and vehicle systems where a clean agent is not essential and where the superior fire extinguishing characteristics of dry powder can be employed. Since there is no design code for the application of this system, a national design code for dry powder systems should be established as soon as possible.

5) National Standard for Inert Gas Fire Extinguishing Agents

Inert gas systems are in a category of clean fire extinguishing systems which will not leave an agent residue after system discharge. This type of system have been used extensively as an alternative to halon systems in many total flooding fire protection applications. In the ISO standard on gas fire extinguishing systems, there are several sections dedicated specially to the requirements of four variations of inert gas agents. These 4 agents are nitrogen, argon, a blend of nitrogen and argon and finally a blend of nitrogen, argon and carbon dioxide. In China, there is no standard regulating the requirement for these 4 inert gases / blends of gases to be used in the fire protection sector. In order to make the use of inert gas systems possible, a standard to describe the quality of the agents is required.

6) Review and revise the Chinese Halon Essential Uses Criteria and List

In China, much progress has been made by defining the "non-essential" uses of halon and forbidding the use of halons in those applications. In order to further the halon phaseout plan successfully and make the ban a continuously tightening process, it is necessary to investigate and identify those applications or service conditions where halons are truly essential, such as on aircraft, special vehicles and similar applications where none of the halon alternatives can perform acceptably for reasons of weight, space or other parameters. With the development of the essential uses criteria and list, it is expected that the ban can be broadened from the present "non-essential" uses to all applications except those which are deemed essential. The information from this activity is necessary to serve as the basis for new MPS regulations and the continued planning and operation of the halon bank.

7) Study on the Test Equipment for Portable Light Weight CO_2 Fire Extinguishers

In the 1999 halon sector annual program, there is a TA project to establish a national standard for portable light weight CO_2 fire extinguisher. In order to make the implementation of that standard possible, the test equipment necessary to assure the light weight extinguisher meets the requirements of the standard must be developed a soon as possible.

8) Revision of the National Standard for Portable Mechanical Foam Fire Extinguishers

The current national standard for mechanical foam extinguishers was issued in 1994 and is the guidebook to test AFFF, synthetic foam and fluoro-protein foam fire extinguishers. This standard is not consistent with the requirements of ISODIS7165 which is the standard for fire protection, fire extinguishers. In order to improve the product performance level of this type of extinguisher and to achieve more consistency with the more current ISO standard, the revision of the national standard is very important and necessary.

9) Revision of the National Standard for Portable Dry Powder Fire Extinguishers

As the main alternative for halon fire extinguishers, dry powder extinguishers have become so important in the overall fire protection in China that without dry powder extinguishers, the halon phaseout would not be possible. In the 1998 technology assistance activities, there is a project that is nearing completion to revise and improve the national standard for dry powder fire extinguishing agent. The national standard for dry powder fire extinguisher was issued on 1984 and requires significant revisions to both assure the performance of this now much more important extinguisher and, as with the foam extinguisher, to make it more consistent with the requirements of ISODIS7165.

10) Study on the use of a Bulk Nitrogen Supply for the Pressurization of Fire Extinguishers

Today, many fire extinguisher manufacturers in China use many single high pressure nitrogen cylinders to provide pressurizing gas for dry powder, AFFF and synthetic foam extinguishers on the production line. The method is inefficient to manufacture extinguishers and will grow more inefficient as the production of these extinguishers increases. In order to improve productivity and consistency, the study on developing a system using liquid nitrogen will be helpful.

11) Training of Personnel Involved in Phaseout Activities

In order to implement the phaseout plan effectively, it is necessary to train staff of local environmental protection bureaus, local fire bureaus and halon enterprises. Training is needed to prepare enterprises to bid in the following year, to supervise halon production and consumption, to manage the tradable production quota system, and to learn operating procedures in the halon sector phaseout approach. Meanwhile, in halon sector approach, the financial audit and the performance audit are required, therefore, it is necessary to train audit agencies on the sector approach and the annual plan. This type of training will need to be repeated every year in the first few years of implementation.

12) Performance audit training

See Table 1.

Supply of substitutes

1. Establishment of an ABC dry powder production line with production capacity of 3,000 MT annually in Foshan Electro-Chemical General Plant.
2. Establishment of a production line for light weight CO_2 extinguisher cylinders: Since CO_2 extinguishers are an important substitute for halon extinguishers, it is necessary to establish a production line for lighter weight CO_2 extinguisher cylinders to replace the current CO_2 extinguishers in China which use heavy and thus difficult to use carbon steel cylinders. .

The two activities will be financed by China and/or through potential savings when confirmed after the audit for 1998 annual plan.

The above policy initiatives, enterprise-level and technical assistance activities are summarized in Table 1 below.

Table 1. 2000 Annual Program

Halon phaseout targets & policy instruments					
	Start of program (MT)	Phaseout Target (MT)	End of program (MT)	Key Actions Required	Key Dates
Halon 1211 Production	5,970	1,990	3,980	1. Closures of halon agent producers 2. TA activities to help phaseout	1. Jan-Dec. 2000
o.w. export	600		400		
Consumption	5,370	1,790	3,580	1. Closures of extinguishers manufacturers 2. Conversion of halon fire extinguishers to non-halon extinguishers	1. Jan.-Dec. 2000 2. 1 quarter of 2000 to start conversion
Halon 1301 Production	618	0	618	1. Activities to help phaseout.	
Consumption	300	0	300	1.Appropriate TA to help future phaseout.	
Continuation of policy instruments					
Policy Instruments	Actions Required				Key Dates
1. Bidding system	1. Training for the 2000 bidding 2. Bidding started 3. Bidding completed 4. Bid winners awarded for 2000 5 Contracts signing with winners 6. Implement closure/ conversion contracts.				1. Sept./Oct. 1999 2. Oct. 1999 3. Dec.1999 4. Dec. 1999 5. Dec. 1999 6. Closure -- Jan. to Dec. 2000 Conversion—starting Jan. for 24 month period
2. Tradable production quota for halon producers	1. Establish 2000 halon production quota ; 2. Issue 1999 production quota to halon producers for 1999				1. Dec. 1999 2. Dec. 1998
3. The ban on halon extinguisher uses in non-essential areas	1. Promotional campaign on the ban, through various channels; 2. Joint supervision of ban by local Fire Fighting Bureaus and Envir. Protection Bureaus.				1. Through 2000 2. Through 2000

Table 1: 2000 Annual Program (Cont')

Enterprise-level Activities						
	Funding Requested (US$ mill)	Existing enterprises	# of enterprise targeted	# of enterprises at end of 2000	Key Actions Required	Key Dates
1. Closure of halon agent producers	4	6	3-5	2-5	Selection through bidding process	1. Bid winners announced Dec. 99 2. Contracts signed Dec. 1999 3. Completed in 12 months
2. Closure & conversion of halon extinguisher manufacturer	5.3	47	33-37	10-14	Selection through bidding process	1. Bid winners announced Nov. 99. 2. Contracts signed no later than Dec. 1999 3. Completed in 12-24 months
3. Conversion of halon fire extinguishing system manufacturers	0.4	19	2-3	16-17	Selection through bidding process	1. Bid winners and contracts signed no later than Dec. 1999 2. Completed in 24 months
Subtotal	9.7					

TECHNICAL ASSISTANCE ACTIVITIES			
Activities	MLF funding requested (US$'000)	Actions Required	Key Dates
1. Design Code for Mist Water Fire Extinguishing System"	75	Selection of qualified institutions to revise standards	1. Contract signed no later than 2Q 2000. 2. Finish work within 12-24 months.
2. National Standard for Performance Requirement and Test Method of Components of Water Mist Fire Extinguishing Systems	75	Selection of qualified institutions to revise standards	1. Contract signed no later than 2Q 2000. 2. To be completed in 12-24 months
3. Public Awareness for halon sector approach and halon alternative technology	100	Selection of qualified institutions to revise standards	1. Contract signed no later than 2Q 2000. 2. Finish work within 12-24 months.

Table 1: 2000 Annual Program (Cont')

TECHNICAL ASSISTANCE ACTIVITIES			
Activities	MLF funding requested (US$'000)	Actions Required	Key Dates
4) Design code for Dry Powder Fire Extinguishing Systems	75	Selection of qualified institutions to revise design code	1. Contract signed no later than 2Q 2000. 2. Finish work within 12-24 months.
5) National standard for Inert Gas Fire Extinguishing Agentst	65	Selection of qualified institutions to formulate national standard	1. Start no later than 2Q 2000 2. Finish work within 12-24 months.
6) Review and Update of Chinese Halon Essential Use Criteria and List	70	Selection of qualified institutions to undertaken study	1. Contract to sign no later than 2Q 2000 2. To be completed 12-24 months
7) Study on Test Equipment for Portable Light Weight CO2 Fire Extinguishers	90	Selection of qualified institutions to undertaken study	1. Contract to sign no later than 2Q 2000 2. To be completed 12-24 months
8) National Standard for Portable Mechanic Foam Fire Extinguisher	65	Selection of qualified institutions to undertaken study	1. Contract to sign no later than 2Q 2000 2. To be completed 12-24 months
9) Revision national standard for portable dry powder fire extinguisher	65	Selection of qualified institutions to undertaken study	1. Contract to sign no later than 2Q 2000 2. To be completed 12-24 months
10) Study on the use of Bulk Nitrogen Supply for the Pressurization of Fire e Extinguishers	80	Selection of qualified institutions to undertaken study	1. Contract to sign no later than 2Q 2000 2. To be completed 12-24 months
11) Training	60		Training will be carried out through the 2000.
12) Performance audit training			
13) International consultants	80	International consultants will be recruited by SEPA to help local consultant firms to study, design and revise standards, codes, etc. Appointments dates will be throughout 1999.	
Subtotal	900		
TOTAL for phaseout activities	10,600		

Table II: 2000 Annual Program - Proposed Performance Indicators

Halon Phaseout Targets				
Halon sector	Start of program (MT)	Phaseout Target (MT)	End of program (MT)	Performance Indicators
Halon 1211 Production	5,970	1,990	3,980	• Production levels (national aggregate)
o.w. exports	600		400	
Consumption	5,370	1,790	3,580	• Consumption levels (production plus imports minus exports)
Halon 1301 Production phase-out target	618	0	618	• Production levels (national aggregate)
Consumption phaseout target	300	0	300	• Consumption levels (production plus imports minus exports)

Continuation of Policy Instruments	
Initiatives	Performance Indicators
Bidding system	• bidding for 2000 annual plan • Winning enterprises for 2000 selected • Enterprises trained for bid preparation for 2001 bidding
Tradable production quota for halon producers	• Annual production quota to halon producers for 2000 issued • Production reports from enterprises received
The ban on halon extinguisher uses in non-essential areas	• Promotional campaigns on the ban undertaken; • Local Fire Fighting Bureaus and Envir. Protection Bureaus engaged in overseeing ban enforcement.

Enterprise-level activities				
Activities	Funding requested (US$mill)	Existing Enterprises	# of enterprises at end of 2000	Performance Indicators
Closure of halon agent producers	4	6	3-5	• Number of ODS reduction contracts signed for closure • Number of closures completed
Closure & conversion of halon extinguisher manufacturer	5.3	47	10-14	• Number of ODS reduction contracts signed for closure or conversion • Number of closures completed • Number of conversions completed and implementation progress
Conversion of halon fire extinguishing system manufacturers	0.4	19	17	• Number of ODS reduction contracts signed for conversion • Number of conversions completed and/or implementation progress
Subtotal	9.7			• Total disbursement to enterprises

Table II: 2000 Annual Program - Proposed Performance Indicators (cont')

Technical assistance activities		
Activities	Amount in US$'000	Performance Indicators
1) Design Code for Water Mist Fire Extinguishing Systems"	75	Date of invitation sent
2) National Standard for the Performance Requirement and Test Method for Components for WaterMist Fire Extinguishing Systems	75	Date of bidding
3) Public Awareness for halon sector approach and halon alternative technology	100	Date of bid awards
4) Design code for Dry Powder Fire Extinguishing Systems	75	Contract amounts
5) National standard for Inert Gas Fire Extinguishing Agentst	65	Date of contract signing
6) Study on test equipment for portable light weight CO2 fire extinguishers	90	Starting date of contracts
7) Review and update of the Halon Essential Use Criteria and List.	70	Implementation schedule
8) National Standard for Portable Mechanical Foam Fire Extinguisher	65	Implementation progress
9) National Standard for Portable Dry Powder Fire Extinguisher	65	Completion date of contracts
10)Study on the use of bulk Nitrogen Supply for pressurization of Fire Extinguishers	80	Disbursements to different activities
11) Training	60	Training dates Training participants
12) Performance audit training		
12) International consultants	80	Date of invitation sent Date of contracts Contracts dates and amounts Date of completion of works
Subtotal	900	
TOTAL for Phaseout Activities	**$10.6million**	

Tabl

CHINA Halon Sector Phaseout Action Plan, January 1,1998 to January 1,2010															
		First Stage			Second Stage					Third Stage					Total Funding Request
Year	Base line production	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Halon 1211 (MT)															
Production target	9,950	7,960	5,970	3,980	3,317	2,654	1,990	1,990	1,990	0	0	0	0	0	
o.w. Export		800	600	400	200	100	100	100	100	0	0	0	0	0	
Import		0	0	0	0	0	0	0	0	0	0	0	0	0	
Domestic Consumption		7,160	5,370	3,580	3,117	2,654	1,890	1,890	1,890	0	0	0	0	0	
Production phaseout target		1,990	1,990	1,990	663	664	664	0	0	1,990	0	0	0	0	
Consumption phaseout target		1,790	1,790	1790	463	564	764	0	0	1,990	0	0	0	0	
Halon 1301 (MT)															
Production target[3/]	618	618	618	618	618	600	600	600	600	150	150	150	150	0	
o.w. Export		318	318	318	318	400	400	400	400	50	50	50	50	0	
Import		0	0	0	0	0	0	0	0	0	0	0	0	0	
Domestic Consumption		300	300	300	300	150	150	150	150	100	100	100	100	0	
Production phaseout target		0	0	0	0	18	0	0	0	450	0	0	0	150	
Consumption phaseout target		0	0	0	0	150	0	0	0	50	0	0	0	100	
Aproved MLF Funding ('000) on Nov 14, 1997		12,400	9,700	10,600	4,500	3,700	5,900	1,200	1,800	11,400	400	300	100	0	62,000

* In December 1997, China established the national quota for 1998 at the lower level of no more than 7,912 MT

ANNEX 1
Closures of halon production facilities and lines

I. 1998 Annual Program

Table 1: Closure of Halon 1211 Plants with 1998 Production Quotas

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1.Zhedong No.1 Chemical Plant	347	January 1, 1998	Project completed	Plant closure
2.Zhejiang Dongyang No.2 Chemical Plant	1,004	January 1, 1998	Project completed	Plant closure
3.Zhejiang Xiaoshan Fire-fighting Chemical Plant	387	January 1, 1998	Project completed	Partial closure. One out of two production plant closed.
4.Foshan Electro-Chemical General Plant	300	January 1, 1998	Project completed	Partial closure. Reactor pipes dismantled.
Total (Quotas sold back to Gvt.):	**2,038**			

Table 2: Closure of Halon 1211 plants not assigned 1998 production quotas

Name of the plant	Halon phasout (MT)	Year of stop production	Implementation status	Remarks
1.Dalian Fire-extinguishing Agent Plant	165.9	1997	Equipment dismantled completely	Dismantling and destruction of equipment verified
2.Zigong Fujiang Chemical Plant	54.0	1997	Equipment dismantled completely	Dismantling and destruction of equipment verified
3.Guangdong Dongguan Fire-fighting Equipment Plant	320.0	1997	Equipment dismantled completely	Dismantling and destruction of equipment verified
4.Guangxi Beihai Ocean Chemical Plant	40.0	1997	Equipment dismantled completely	Dismantling and destruction of equipment verified
5.Wenling Salt Farm Chemical Plant	70.5	1997	Equipment dismantled completely	Dismantling and destruction of equipment verified
Total	**650.4**			

II. 1999 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1. Zhejiang Xiaoshan Fire-fighting Chemical Plant	400	January 1, 1999	Project completed	Plant closure
2.Shandong Haihua Group Shouguang Fire-fighting Chemical Plant	500	January 1, 1999	Reactor pipes dismantled.	Partial closure.
3.Wuxian Chemical Plant	388	January 1, 1999	Project completed	Partial closure.
4. Zhejiang Dongyang Chemical Plant	654	January 1, 1999	Reactor pipes dismantled.	Partial closure.
Total (Quotas sold back to Gvt.):	**1942**			

ANNEX II
List of beneficiary fire extinguisher manufacturers

I. 1998 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Planned completion date	Remarks
1.Zhejiang Xiangshan No.1 Fire-fighting Equipment Plant	1998.03.14	223.0	The equipment has been dismantled.	1998.10.31	Plant closure
2.Zhejiang Yiwu Fire-fighting Extinguisher Plant	1998.03.14	162.2	Finished, pass acceptance	1998.12.31	Plant closure
3.Changzhou Fire-fighting Equipment Plant	1998.03.14	47.5	Most of the conversion has been done.	1999.12.31	Conversion
4.Dalian Jinzhou Fire-fighting Equipment Plant	1998.03.14	105.7	Most of the conversion has been done.	1999.11.30	Conversion
5.Guangxi Wuzhou Fire-fighting Equipment Plant	1998.03.14	52.4	Most of the conversion has been done.	1999.12.31	Conversion
6.Guangzhou Zhujiang Fire-fighting Equipment Plant	1998.03.14	138.4	Most of the conversion has been done.	1999.10.30	Conversion
7.Jiangxi No.1 Fire-fighting Equipment Plant	1998.03.14	220.8	Most of the conversion has been done.	2000.01.30	Conversion
8.Nanjing Heli Fire-fighting Equipment Plant	1998.03.14	146.4	Most of the conversion has been done.	1999.12.31	Conversion
9.Ningxia Yongning Fire-fighting Equipment Plant	1998.03.14	23.0	Most of the conversion has been done.	1999.09.30	Conversion
10.Panyu Shengjie Fire-fighting Equipment Plant	1998.03.14	435.1	Most of the conversion has been done.	2000.01.30	Conversion
11.Shanghai Haishen Fire-fighting Equipment Plant	1998.03.14	149.6	Most of the conversion has been done.	2000.03.01	Conversion
12.Shanghai Punan Fire-fighting Equipment Plant	1998.03.14	268.4	Most of the conversion has been done.	2000.01.30	Conversion
13.Shanghai Qingpu Fire-fighting Equipment Plant	1998.03.14	169.9	Most of the conversion has been done.	1999.12.31	Conversion
14.Shenyang Fire-fighting Equipment Plant	1998.03.14	153.7	Most of the conversion has been done.	1999.10.30	Conversion
15.Xiangshan Fire-fighting Equipment Plant	1998.03.14	270.6	Most of the conversion has been done.	1999.08.30	Conversion
16.Ningbo Sanyou Fire-fighting Equipment Ltd.	1998.03.14	50.0	Most of the conversion has been done.	1999.06.30	System conversion
Total (Average halon 1211 consumption 1995 to1997):		**2,616.7**			

II. 1999 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Planned completion date	Remarks
1.Zhejiang Dongyang Fire-fighting Equipment Plant	1999.03.16	131.88	The equipment has been dismantled.	2000.03.16	Plant closure
2.Shanghai Global Fire-fighting Extinguisher Plant	1999.03.16	32.66	The equipment has been dismantled.	2000.03.16	Plant closure
3.Helongjiang Fire-fighting Equipment Plant	1999.03.16	23.4	Conversion has started.	2001.03.16	Conversion
4.Guangzhou Fire-fighting Equipment Plant	1999.03.16	83.431	Conversion has started.	2001.03.16	Conversion
5.Jiangsu Taixin Fire-fighting Equipment Plant	1999.03.16	336.6	Conversion has started.	2001.03.16	Conversion
6.Chongqing Zhendan Fire-fighting Equipment Plant	1999.03.16	60.77	Conversion has started.	2001.03.16	Conversion
7.Heilongjiang Shangzhi Fire-fighting Equipment Plant	1999.03.16	78.4	Conversion has started.	2001.03.16	Conversion
8.Hubei jiangling Fire-fighting Equipment Plant	1999.03.16	194.78	Conversion has started.	2001.03.16	Conversion
9.Shandong Weifang Fire-fighting Equipment Plant	1999.03.16	153.116	Conversion has started.	2001.03.16	Conversion
10.Shunde Fire-fighting Equipment Plant	1999.03.16	192.72	Conversion has started.	2001.03.16	Conversion
11.Guangzhou Fire-fighting Equipment Plant	1999.03.16	29.697	Conversion has started.	2001.03.16	System Conversion
Total (Average halon 1211 consumption 1995 to1997):		**1317.431**			

ANNEX III
Implementation of Technical Assistance Activities in the 1998 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned Completion Date	Remarks
1.Revision of Standards for ABC Powder	Tianjin Fire Research Institute	1998.04.28	Test on existing ABC powder completed Completed 1st draft standard for review by fire protection industry.	2000.12.31	
2.Design Codes for Gaseous Fire Extinguishing Systems	Tianjin Fire Research Institute	1998.04.28	Test equipment has been installed; Information on similar international standards reviewed. Completed 1st draft for review by the fire protection industry.	2000.01.31	
3.Standards for Components of Gaseous Fire Extinguishing Systems	Tianjin Fire Research Institute	1998.04.28	Completed 1st draft standard for review by the fire protection industry.	2000.02.28	
4.Halon Management Plan-Overall Management	Shanghai Fire Research Institute	1998.04.28	1) Table for the survey has been designed and sent to Fire Fighting Bureaus in China, the survey have been launched, traning material for the survey have been compiled; 2) Assumption model has been designed	1999.12.31	
5.Halon Management Plan-Training Courses and Public Awareness Materials	Shanghai Fire Research Institute	1998.04.28	1) A booklet on public awareness has been completed; 2) Of the 5 part planned, Part 1 and Part 2 of the national training manual have been finished and material have been compiled for Part 3 and Part 4.	2000.06.30	
6.a)Halon Management Plan-Provincial Promotions and Demonstration Centers	Shanghai Fire Fighting Bureau	1998.04.28	1) Demonstartion service centers has been established and are now operating; 2) Regulation regarding sale and servicing of halon fire extinguishers have been have been issued. 3) A survey on halon consumption in the Shanghai area has been complted and further analysis are carried out. 4) Public awareness material have been developd and more thn 10,000 posters for popularizing halon phaseout activities has been printed and distributed on September 16.	1999.10.31	

6.b)Halon Management Plan-Provincial Promotions and Demonstration Centers	Guangdong Fire Fighting Bureau	1998.04.28	1) The demonstration center has been established and are now in operation. 2) A series of local policies have been formulated and issued. One of them requires that all halons are sold through the demosnrtation centers; 3) Halon consumption survey have been completed and report have been submitted to MPS 4) Public awareness has been launched on newspapers, magazines and TV.	1999.08.31	
7.Development of halon Management Database and Data collection System	Qinghua University	1998.04.28	The software for the regional halon consumption investigation and dynamic monitoring have been designed and used by the Guangdong demonstration center.	1998.09.28	
8.Management Information System	Qinghua University	1998.04.28	The system is in operation now.	1998.04.02	
9.Training	SEPA		Two training workshops have been conducted	1998.12.10	
10. Export/Import	Beijing University	1998.08 (planned)	Draft report submitted for review by SEPA and the bank.		

THE CFC PRODUCTION SECTOR OF CHINA
2000 ANNUAL PROGRAMME

PROJECT DESCRIPTION

1. In accordance with the Agreement for the China Production Sector, which requests that annual programmes be submitted for review at the last meeting of the year preceding the year of the programme, the World Bank submitted the year 2000 annual programme for the implementation of the Agreement, with the understanding that funding for the 2000 programme will be approved at the first meeting in that year based on satisfactory performance, as per the Agreement

2. The submission included 2 parts:

(a) Part I is a progress report on the implementation by China of the 1999 programme as of August 1999. The 1999 programme consisted of two components:

(i) Component one was the closure of 14 CFC plants that were not in operation in 1997. The report listed the names of the enterprises, CFC product and capacity, raw materials, and date of dismantling and verification.

(ii) Component two of the 1999 programme was the reduction of 5,420 ODP tonnes of production from plants that were producing in 1997. This would enable China to reduce the national CFC production level from 50,351 ODP tonnes to 44,931 ODP tonnes as per the target in the Agreement. China intended to implement this reduction by production quota control. The report provided a list of plants with names, CFC product, capacity and the 1999 reduction quota of the plants that would be shut down. The result of implementing this component of the 1999 programme would be verified by the World Bank and reported to the first meeting of the Executive Committee in 2000.

(b) Part II of the World Bank's submission is a description of the components of the 2000 programme, which includes policy actions, production reduction quota, and technical assistance activities. The key component, the production reduction quota would require a reduction of 4,931 ODP tonnes in 2000 to meet the Agreement target that the national CFC production should be no more than 40,000 ODP tonnes in 2000. China will continue to implement the tradable production quota combined with the bidding, as well as promulgation and implementation of an export/import control mechanism.

3. The World Bank's submission requested disbursement of US $13 million for implementation of the year 2000 programme and the support cost.

COMMENTS FROM THE SECRETARIAT

1. The Secretariat commented on the World Bank's submission and received feedback from the World Bank. Therefore the following comments had taken into account the feedback from the World Bank.

Component one of the 1999 programme: closure of the 14 CFC plants that were in operation in 1997

2. The World Bank submitted in September 1999 a request for the release of the 2nd tranche of US $10 million and the associated support cost, together with an inspection report on the implementation of the dismantling of the 14 plants. The Secretariat reviewed and commented on the Bank's submission and subsequently circulated the inspection report and the comments to members of the Committee for clearance on a non-objectional basis. By the close of the deadline, no objection was received and the request was cleared. The Secretariat informed the Treasurer to release to the World Bank US $10.9 million, including support cost.

Monitoring of the implementation of long-term agreement(s)

3. The Agreement for the China Production Sector is to be implemented over a period of ten years (1999-2009) and adequate monitoring on implementation is important and should be in place from the very beginning. This is especially relevant, considering that some of the reduction targets will be implemented through gradual closures. That means that the production of a plant will be shut down over a period of several years. Without knowing the start-off point, the intermediate reduction targets and the end point, on a plant basis, it is impossible to do effective monitoring. Therefore it is necessary to include the following information in the inspection report on the implementation of component two of the 1999 programme and the annual programmes of future years:

- Name of plant, plant identification number used in the SRIC audit report.
- CFCs produced.
- Capacity.
- Production level of the year preceding closure (CFC-11, CFC-12 and CFC-113 reported separately).
- Production to be closed/reduced.
- Balance to remain in production.

In table form, it should be presented as follows:

Name of producer, ID no. from SRIC report	CFCs	Capacity	Production level of the year preceding closure	Production to be closed/reduced	Balance remaining in production

RECOMMENDATIONS

1. To enable effective monitoring, the information included in paragraph 6 above should be included in the inspection report to be submitted to the first meeting in 2000 by the World Bank on the implementation of component two of the 1999 programme and the annual programmes of future years of the China sector plan.

2. The Executive Committee may wish to note the 2000 annual programme on the CFC production sector and request the World Bank to include in their inspection report on the implementation of component two of the 1999 programme:

- Name of plant, plant identification number used in the SRIC audit report.
- CFCs produced.
- Capacity.
- Production level of the year preceding closure (CFC-11, CFC-12 and CFC-113 reported separately).
- Production to be closed/reduced.
- Balance to remain in production.

THE CFC PRODUCTION SECTOR

2000 ANNUAL PROGRAM

AUGUST 4, 1999

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INTRODUCTION

1 In accordance with the Executive Committee's approval of "The Sector Plan for CFC Production Phaseout in China (Closure Part)" (UNEP/Ozl.Pro/ExCom/27/45/Corr.2), China is hereby requesting release of the **second tranche** of **US$13 million** for the implementation of the 2000 Annual Program. With this funding, China's CFC production will be reduced to a **maximum of 40,000 MT** in 2000. Details of the annual program are in Section B.

2 Since the approval of the China CFC Sector Plan at the 27th Meeting of the ExCom in March 1999 and the release of funds for the 1999 Annual Program, China has begun to implement the project according to the agreed phaseout plan. In accordance with the 1999 Annual Program, China has taken the following actions:

a) promulgated the "Circular on Implementing the Quota System for CFC Production" on May 31, 1999;

b) completed closures of 14 CFC plants as required in the approval conditions for the China CFC Sector Phaseout Plan. The reduction of production capacity resulting from the 14 enterprises totaled 22,630 MT (see page 8, table 1A);

c) closed production lines at additional 3 plants in accordance with the quota regulation. These lines did not produce in 1997 and therefore did not qualify for 1999 production quotas. The reduction of production capacity resulting from the 3 closures totaled 4,000 MT (See page 9, table 1B);

d) completed bidding by CFC plants which had production in 1997. The agreed target for the 1999 production is 44,931 MT, a reduction of 5,420 MT from 50,351 MT, the baseline production level at the start of phaseout plan. Closure activities of these plants/production lines have started; and

e) initiated all technical assistance activities.

Detailed implementation status is described in Section A.

3. ***Chinese CFC phaseout obligations.*** Within the Sector Plan, China agreed to the following phaseout schedule for CFCs in Annex A and Annex B in Group I.

CFC Production Phaseout Schedule and Annual Grant

	Agreed schedule		Planned		
Year	Phaseout amount (MT in terms of ODP)	CFC production not exceeding (MT in terms of ODP)	Phaseout Amount (MT in terms of ODP)	CFC production not exceeding (MT in terms of ODP)	Annual funding level (US$ million)
1999	5,420	44,931	5,420 1/	44,931 1/	20.00
2000	4,931	40,000			13.00
2001	3,800	36,200			13.00
2002	3,300	32,900			13.00
2003	2,900	30,000			13.00
2004	4,700	25,300			13.00
2005	6,550	18,750			13.00
2006	5,250	13,500			13.00
2007	3,900	9,600			13.00
2008	2,200	7,400			13.00
2009	4,200	3,200			13.00
2010	3,200	0			0.00 2/
Total funding					**150.00**

1/ CFC Production and CFC production reduction is provided as per the agrement. The actual reductions and actaul production figures will be provided here in the annual plans for year 2001 and the following year AP's.

2/ Savings from earlier years would be used for funding the year 2010 phaseout.

4. In accordance with the CFC Production Sector Plan, China will have reduced CFC production, by the end of 2000, to an annual level of 40,000 MT and will have phased out during 2000, 4,931 MT in ODP terms, compared to the 1999 quota.

PART A

1999 ANNUAL PROGRAM IMPLEMENTATION STATUS

(As of August 8, 1999)

Phaseout Target

5. The phaseout target for 1999 is to reduce CFC production, measured in ODP, to **44,931 MT**, and thus to phase out **5,420 MT** compared to the baseline production of **50,351 MT** in 1997. Following the completion of the bidding process, quotas for only **44,853 MT**[1] were issued to the remaining 15 CFC plants.

Enterprise Phaseout Activities

6. Under the 1999 Annual Program, China committed to close and dismantle production facilities at 14 enterprises that had not been in production in 1997. Between April 22 and May 12, SEPA signed closure contracts with these 14 enterprises[2] listed in the approval condition for the CFC sector phaseout plan. Moreover, contracts were also signed with another 3 enterprises for closing down production lines that had no production in 1997. These are all permanent closures. The total production capacity dismantled amounted to 26,630 MT ODS. By the end of June, all production lines and plant facilities had been dismantled and their primary CFC production equipment destroyed in accordance with the "Agreement for the China Production Sector".

7. As a result of the quota regulation and bidding system (see below) and the 1999 bidding, contracts were signed in June 1998 with 7 enterprises to phase out a production quotas toalling 5,498 MT of CFCs. All but one of the enterprises have completed dismantling of their facilities and will submit completion reports verifying dismantling and destruction of primary CFC production equipment.

Implementation of Policy Instruments

8. The State Environmental Protection Administration (SEPA), in collaboration with the State Administration of Petroleum and Chemical Industry (SAPCI), promulgated the regulations for the introduction and implementation of a tradable quota system, entitled "Circular on Implementing the Quota System for CFC Production", on May 31, 1999. A bidding system was also introduced together with the promulgation of the trading production quota. After conclusion of the bidding process, 7 producers were awarded grants to reduce 5,498 MT of CFCs, and a

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[1] To achieve a maximum annual production in 1999 of 44,931 MT, the quotas for the 15 CFC plants were adjusted for any CFC produced by the 17 closed enterprises during the period January 1 to April 30, 1999.

[2] In addition to the plants listed in the "Agreement for the China Production Sector" between China and the Multilateral Fund. China also signed a plant closure contract with Liaoning Chemical Group: Chlor-Alkali Plant and production line closure contracts with Fujian Shaowu Fluorochemical Plant and Shangdong Jinan 3F Chemical Company, both of which had no production on their CFC-11 production lines in 1997. Thus, a total of 17 plants/production lines were closed under this category of the program.

national CFC production quota of 44,853 MT was issued in June to the 15 remaining CFC producers in order to ensure that the national production for 1999 stays at or below the agreed target of 44,931 MT.

9. Preparations for introduction of an export and import control mechanism, which would help China to monitor trade in CFCs and eliminate illegal CFC trade, are underway. A study on options for export/import management for halons and CFCs was completed in July 1999, and is under discussion within Government.

Technical Assistance Activities

10. There are ten technical assistance activities in the 1999 Annual Program. Some activities have already started and the rest will start in 1999. All are expected to be completed within two calendar years. The status of activities are summarized below:

a) *Production of an ODS phaseout video*. SEPA is finalizing the draft script. Shooting of the video will start in mid-August, and the video will be completed in November. It will be broadcast on national TV to raise awareness of the general public and authorities in China concerning the necessity for ODS phaseout and the urgency of phaseout activities.

b) *Development of a Management Information System (MIS)*. TORs have been reviewed and approved by the World Bank, and implementation has started.

c) *Development of a substitute strategy*. TORS for this activity, which will be contracted through bidding, are under preparation.

d) *Formulation of Standards for Cyclopentane, HCFC 141b, and HFC 134a*. TORs have been reviewed with the World Bank, and steps are underway to sign a contract with Shanghai Institute on a sole-source basis.

e) *HFC 134a feasibility studies*. Discussions have been held with the World Bank on the process for selecting candidates for carrying out, with grant assistance, feasibility studies for commercially viable production of HFC 134a. Agreement has been reached on pre-qualification processes, criteria and timetables, with a view to selecting winning candidates in early 2000.

f) *Training of personnel involved in phaseout implementation activities*. TORs have been agreed with the World Bank. A bid training workshop was conducted in May 1999 for CFC producers and further training workshops are planned for the remainder of 1999.

g) *An ODS export/import management and monitoring study*. TORs for this study have been prepared. Decisions on the scope of work in this activity await finalization of comments on the study conducted on export/import management under the Halon Sector Plan and determination of any additional work required for implementation of the findings of the study.

h) *Studies on market prospects for closure enterprises*. TORs have been prepared and reviewed with the World Bank. Agreement to start implementation has been reached. A

draft invitation letter will be submitted to the bank for endorsement. All enterprises that closed in 1999 will be invited by letter in early August to submit proposals for TA support to find new business opportunities. It has been agreed that each enterprise can request a maximum of 50% of costs incurred, up to a limit of $10,000, against a signed contract or invoices.

i) *National Workshops*. Agreement has been reached to proceed with activities as proposed in the TORs.

j) *Recruitment of International Technical Consultants.* Will be done when the TORs for the requested support are done and relevant experts have been identified.

Table 1 A: Closures of 14 plants, per China CFC Production Phaseout Approval Conditions

	CFC producers	CFCs	Capacity (MT/Y)	Dismantling verified[3]
1	**Shangdong Dongyue Chemical Co. Ltd. 1 CFC-12 production line, Ref. #: (9), (A3)**	**CFC-12**	**5,000 MT**	***Aug 16-20***
2	**Hunan Yiyang Chlor-Alkali Chemical Co. Ltd. 1 CFC 12 production line. Ref. #: (16), (C2)**	**CFC-12**	**1,000 MT**	**SRI report + *Aug 16-20***
3	**Inner Mongolia Baotou Chemical Plant #1. 1 CFC-12 production line. Ref. #: (17), (C5)**	**CFC-12**	**700 MT**	***Aug 23-27***
4	**Jiansu Jianhu Phosphate Fertilizer Plant 1 CFC-12 production line. Ref #: (18), (C1)**	**CFC-12**	**500 MT**	***August 8-13***
5	**Sichuan Zigong Fujiang Chemical Plant 1 CFC-11 production line and 1 CFC-12 production line. Ref #: (19), (B4).**	**CFC-11 CFC-12**	**1,500 MT 1,000 MT**	***August 8-13***
6	**Zhejiang Linhai Jianxin Chemical Plant 1 CFC-12 production line. Ref #: (20), (B9)**	**CFC-12**	**800 MT**	**SRI report + *August 16***
7	**Guangdong Huiyang Chemical Plant 1 CFC-11 production line and 1 CFC-12 production line. Ref #: (23), (A14).**	**CFC-11 CFC-12**	**1,000 MT 3,000 MT**	***August 8-13***
8	**Henan Hebi Chemical Plant #1. 1 CFC-12 production line. Ref #: (25), (A1)**	**CFC-12**	**1,500 MT**	***Aug 16-20***
9	**Hebei Longwei Fluorochemical Plant #1 2 CFC-12 production lines. Ref #: (26), (C3)**	**CFC-12**	**1,080 MT**	**SRI report + *Aug 16-20***
10	**Guizhou Wuling Chemical Plant. 1 CFC-12 production line and 1 CFC-13 production line. Ref #: (27), (C4)**	**CFC-12 CFC113**	**1,500 MT 50 MT**	**SRI report + *August 8-13***
11	**Guangdong Zhaoqing Chemical Plant. 1 CFC-12 production line. Ref #: (28), (A15)**	**CFC-12**	**500 MT**	***August 8-13***
12	**Shanxi Shangzhou Chemical Plant Ref #: (30), (C6)**	**CFC-12**	**2,000 MT**	***Aug 16-20***
13	**Shanghai Shuguang Chemical Plant 1 CFC-12 production line and 1 CFC-113 production line. Ref #: (32), (A12).**	**CFC-12 CFC113**	**1,000 MT**	***August 8-13***
14	**Zhejiang Linhai Shiyang Chemical Plant 1 CFC-12 production line. Ref #: (35), (B10)**	**CFC-12**	**500 MT**	**SRI report + *August 8-13***
		CFC-11 CFC-12 CFC-113 Total	**2,500 MT 19,080MT 1,050MT 22,630MT**	

[3] Exact date of verification visit to plant by the Bank team. Any reference made to the SRI report in the final column indicates that, according to SRI, the plant has already been dismantled.

Table 1B: Production line closures in accordance with the quota regulation.

	Enterprise name	CFC	Annual capacity	Dismantling verified
15	**Shangdong Jinan 3F Chemical Co. Ltd. 1 CFC-11 production line closed; Ref #: (5), (A1)**	**CFC-11**	**1,500 MT**	***Aug 16-20***
16	**Liaoning Chemical Group Chlor-Alkali Plant. 1 CFC-12 production line.**	**CFC-12**	**1,000 MT**	
17	**Fujian Shaowu Fluorochemical Plant. 1 CFC-11 production line closed; Ref #: (29), (B15)**	**CFC-11**	**1,500 MT**	
	Total	**CFC-11 CFC-12 Total**	**3,000 MT 1,000 MT 4,000 MT**	

Table 2: Permanent plant closures as result of the 1999 annual quota bidding

	CFC producers	CFCs	Capacity	"1999 Quota"
1	**Chongqing Tianyuan Chemical Plant. Ref #: (21), (B2) CFC-11 and CFC-12 are produced on the same production line**	**CFC-11 CFC-12**	**500 MT ***	**48.9 MT 116.2 MT**
2	**Hubei Wuhan Changjiang Chemical Plant Ref #(13), (B5)**	**CFC-11 CFC-12**	**1,500 MT 4,500 MT**	**100.5 MT 928.5 MT**
3	**Jiangsu Wuxian Juxing Chemical Plant. Ref #: (12), (A5).**	**CFC-11**	**2,000 MT**	**370.4 MT**
4	**Jiangsu Wuxian Union Chemical Plant. Ref #: (31), (?).**	**CFC-11**	**1,800 MT**	**431.4 MT**
5	**Jiangxi De'an Refrigeration Plant. Ref #: (02), (B1)**	**CFC-12**	**3,000 MT**	**42 MT**
6	**Shangdong Jinan 3F Chemical Co. Ltd. Ref # (05), (A2)**	**CFC-11 CFC-12**	**1,500 MT 3,500 MT**	**0 MT 1,244 MT**
7	**Shanghai Chlor-Alkali Chemical Plant Co. Ltd. Ref #: (04), (B6)**	**CFC-12**	**7,000 MT**	**2,215.7 MT**
	Total	**CFC-11 CFC-12 Total:**	**7,300 MT 18,000 MT 25,300 MT**	**951.2 MT 4,546.4 MT 5,497.6 MT**

PART B

2000 ANNUAL PROGRAM

Phaseout Objectives and Initial Grant Allocation

11. The phaseout objective of the 2000 Annual Program is to ensure that CFC production at a maximum of 40,000 MT is met. China is requesting the release of the second annual tranche of **US$ 13 million** to achieve this objective.

12. It is envisaged that the US$ 13 million will be allocated to the following categories of activities:

a) US$12.0 million will be used for closing CFC production lines or reducing production levels in some CFC enterprises which received production quota in 1999; and

b) US$1.0 million will be used for technical assistance activities.

Program Activities During the Year

13. ***Policy actions.*** The Government will continue to implement the ***tradable production quota*** combined with the ***bidding mechanism***. During the year, the Government will promulgate and implement an ***export and import control mechanism***.

14. ***Enterprise activities.*** Through the production quota and bidding systems, bid winners would be granted funds for closure. All contracts are expected to be signed by the end of 1999, but in any case will be signed no later than the first quarter of 2000. Closure projects are expected to be completed by the end of June 2000.

15. ***Technical assistance (TA) activities***. TA activities envisaged under the Sector Plan concentrate on strengthening: (a) the overall institutional framework for phaseout; (b) substitute chemical development; (c) management, monitoring & evaluation capabilities of participating institutions; (d) skills of enterprise managers involved in CFC production phaseout activities; and (e) information exchange. These are all essential to the success of the phaseout. All terms of references and detailed work programs will be agreed with the World Bank before implementation. Most of the these activities are expected to be completed within two years. Proposed 2000 TA activities include:

a) *Formulation of standards for HFC-152a, and isobutane.* The objective is to formulate standards for these mature substitutes that are produced in China and used widely to replace CFCs. Setting up standards is necessary to ensure substitute quality. Standards for other substitutes will be developed in subsequent years.

b) *Training of personnel involved in implementation of phaseout activities.* To implement the phaseout plan effectively, it is necessary to train staff in: (i) local environmental protection bureaus; (ii) local bureaus of Petroleum and Chemical Industry; (iii) CFC producers; (iv) Customs and (v) audit agencies. Training is

needed to prepare enterprises to bid in the following year, to train government officials to properly supervise CFC production, and to learn operating procedures of the CFC production sector phaseout approach. This type of training will need to be repeated every year in the first few years of implementation. For the 2000 Annual Program, a workshop to evaluate progress in the phaseout program, including ODS production phaseout, consumption demand and substitute supply, is included.

c) *Studies of market prospects for closure enterprises*– This TA activity requests US$ 100,000 for a continuation of the TA activity started during 1999, whereby funds are made available for enterprises to finance investigation of market possibilities when they completely close down CFC production facilities.

d) *Recruitment of international technical consultants*. Consultants will be recruited, where and when necessary, to assist in the formulation of terms of reference and implementation of the above technical assistance activities.

e) *Performance audit training*. Performance audits constitute an important part of the program. It has been agreed to provide training to the audit team through training workshops in Beijing using foreign consultants familiar with performance audits. In addition, the audit training will include on-site training with experienced performance audit teams in Hong Kong or Singapore

f) Other TA activities that are necessary for effective phaseout may be developed during the year.

16. The above policy initiatives, enterprise-level and technical assistance activities are summarized in Table 1 below.

TABLE I: 2000 ANNUAL PROGRAM (AMOUNT IN US$ MILLION)

CFC production phaseout targets & policy initiatives						
	Funding (US$mill.)	1999 Quota[4] (MT)	Phaseout in 2000 (MT)	Allowed Production in 2000[5] (MT)	Performance Indicators	Key Dates
CFC in terms of ODP	13	44,931	4,931	40,000	1. Closures of current producers and reduction in production in remaining producers 2. Implementation of TA activities to help phaseout. 3. Production level not more than 40,000 MT	1. Dec. 1999-June 2000 2. Dec. 1999-Dec. 2000 3. Dec.31, 2000

Policy Initiatives			
Initiatives	Funding	Performance Indicators	Key Rates
1. Bidding system	incl.in TA n.a. n.a. n.a. incl. in TA	1. Training enterprises for bid preparation in the 2000 bidding 2 Determine winning enterprises for 2000 3. Sign closure contracts with bid winners 4. Implement closure contracts 5 Train enterprises for bid preparation for 2001 bidding	1. Oct. 1999 2. Nov. 1999 3. Dec. 1999 4. Dec. 1999-June 2000 5. Oct. 2000
2. Tradable production quota for CFC producers	n.a.	1. Establish 2000 annual CFC production quota 2. Issue annual production quota to CFC producers for 2000	1. Feb. 2000 2. Feb. 2000
3. Import/export trade management	n.a.	1. Establish the export/import licensing system	1. January 2000

Enterprise Activities						
	Funding (US$ million)	Existing lines	# of lines targeted	# of lines at end of 2000	Performance Indicators	Key Dates
Closure of CFC11/12/113 production lines	12.00	26	5-8	18-21	1. Training of bidders 2. Bidding for grant funds 3. Selection of bid winners 4. Contracts signed 5. Facilities dismantled	1. Oct. 1999 2. Oct. 1999 3. end Nov. 1999 4. end-Dec. 1999 5. no later than June 2000

[4] Total quota issued for 1999, compared with the amount allowed under the Phaseout Plan of 44,931 MT.
[5] Maximum production quota that can be allocated for calendar 2000.

TABLE I: 2000 ANNUAL PROGRAM (CONT.')
(AMOUNT IN US$ MILLION)

Technical assistance activities			
Activities	Funding 1/ (US$ Million)	Performance Indicators	Key Dates
1. Formulation of standards for HFC-152a and isobutane	0.10	1. TOR to be agreed with the Bank 2. Contract signing 3. Basic information gathering on substitute standards and test methods in China 4. Draft standards prepared 5. Draft standard seminar 6. Draft standard ready to be submitted to National Standard Committee in charge of approvals of standards	1. Oct. 1999 2. Dec. 1999 3. Jan – June 2000 4. no later than Dec. 2000 5. no later than Jan. 2001 6. no later than June 2001
2. Training	0.09	1. TOR to be agreed with World Bank 2. Training on supervision and evaluation of CFC production, bidding system, management of CFC production quota system, and CFC production operating manual 3. Seminar on review of ODS production phaseout	1. Oct. 1999 2. Start in Jan. 2000. Specific schedules to be detailed in TORs 3. Sept. 2000
3. Studies of the market prospect for closure enterprises	0.10	1. Invitation of applications 2. Bid evaluation 3. Bid award 4. Contract signing 5. Contracts signing between bid winners and their contractors 6. SEPA receipt of progress reports from bid winners 7. Completion of projects by individual bid winners 8. SEPA completion report for the project	1 No later than Feb.2000 2. March 2000 3. March 2000 4. April 2000 5. May-June 2000 6. Throughout the year 7. Throughout the years of 2000 and 2001 8. End of 2001
7. Recruitment of international consultants	0.10	1. Finalization of TORs for consultant assignments 2. Signing of contracts 3. Completion of work and submission of reports by consultants	1. Throughout 2000 2. Throughout 2000 3. Throughout 2000
8. Performance audit training	0.10	1. Finalization of TORs for performance audit training and on-site training abroad. 2. Signature of training contracts 3. Completion of training and reporting	1. Nov 1999 2. Feb 2000 3. April 2000
Other TA to be identified during the year	0.61	1. Identification of needs and preparations of TORs	1. Throughout 2000
Subtotal	1.00		
TOTAL for phaseout activities	**13.00**		

1/ These are estimated costs. After bidding for TA contractors, these costs will be adjusted to reflect contractual amounts for each TA. All TA activities are to be completed in two years from January 2000.

PROJECT EVALUATION SHEET
CHINA

SECTOR: Refrigeration ODS use in sector (1995): 24,414 ODP tonnes

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

Project Titles:

(a) Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Moganshan Electric Appliances Co.
(b) Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Zhejiang Electrical Equipment Co.

Project Data	**Domestic**	**Domestic**
	Moganshan	**Zhejiang**
Enterprise consumption (ODP tonnes)	667.63	199.01
Project impact (ODP tonnes)	667.62	199.00
Project duration (months)	36	36
Initial amount requested (US $)	3,550,322	2,826,679
Final project cost (US $):		
Incremental capital cost (a)	2,247,185	1,903,205
Contingency cost (b)	219,419	185,021
Incremental operating cost (c)	302,514	101,556
Total project cost (a+b+c)	2,769,118	2,189,782
Local ownership (%)	100%	100%
Export component (%)	0%	0%
Amount requested (US $)	2,769,118	2,189,782
Cost effectiveness (US $/kg.)	4.15	11.00
Counterpart funding confirmed?		
National coordinating agency	SEPA	SEPA
Implementing agency	UNIDO	UNIDO

Secretariat's Recommendations		
Amount recommended (US $)		2,189,782
Project impact (ODP tonnes)		199.00
Cost effectiveness (US $/kg)		11.00
Implementing agency support cost (US $)		250,876
Total cost to Multilateral Fund (US $)		2,440,658

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1998)		Not available	ODP tonnes
- Baseline consumption* of Annex A Group I substances (CFCs)		57,818	ODP tonnes
- 1998 consumption of Annex A Group I substances		Not available	
- Baseline consumption of CFCs in refrigeration sector		Not available	
- 1998 consumption of CFCs in refrigeration sector			
- 1995 consumption of CFCs in refrigeration sector		24,414	ODP tonnes
- Funds approved for investment projects in refrigeration sector as of July 1999	US $	74,956,022	
- Quantity of CFC to be phased out in refrigeration sector as of July 1999 (28th Meeting)		9,848	ODP tonnes

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

2. In the context of decision 27/16 on incremental operating costs for compressors, the Government of China presented information regarding domestic refrigeration enterprises and factories producing hermetic compressors to the 28th Executive Committee (UNEP/Ozl.Pro./ExCom28/Inf.2). Forty-seven enterprises are included in the list of producers of domestic refrigerators and freezers. In 1997, the production of domestic refrigerators and freezers was 10.4 million units and 3.8 million units respectively. The production of hermetic compressors was 7.19 million units at 18 factories. ODS consumption by original equipment manufacturers in the domestic and commercial refrigeration sub-sectors in 1995 is estimated to be 7,081 ODP tonnes (based on 1995 data) with ODS consumption in the servicing sector at 17.333 ODP tonnes. The Executive Committee has approved 60 projects at cost of US $74,956,022 for manufacturers of refrigerators and freezers in the domestic refrigeration sub-sector to phase out of 9,848 ODP tonnes.

3. The Executive Committee has approved a total of US $10.9 million for the conversion of eight hermetic compressor manufacturing facilities with installed production capacity about 11 million units of non-ODS based compressors a year. The Executive Committee has also approved 19 projects for conversion of 20 manufacturers of commercial refrigeration compressors at about US $44.3 million to phase out 4,250 ODP tonnes in the commercial refrigeration sub-sector.

4. The production of refrigerators and freezers has increased from 8.1 million units in 1993 to 14.2 million units in 1997, an increase of 75.3%. The target for the complete phase out of CFC consumption in the domestic refrigeration sub-sector in China is 2005.

Project description

5. The production of refrigerators and freezers started at Mogashan in 1994 when 55,782 units were produced. By 1998, the production increased to 433,657 units per year with consumption of 549.24 ODP tonnes CFC-11 and 118.39 ODP tonnes CFC-12. The project document states that the significant growth in the production rate is due to improved production process and better marketing policies. The objective of the proposal is to convert from CFC-11 blowing agent to cyclopentane, and CFC-12 refrigerant to isobutane resulting in a total phase out of 667.63 ODP tonnes. The conversion of the foam part involves the modification of five high pressure foaming machines of 1985, 1988 and 1994 vintage, four foaming cabinet lines and one door line for cyclopentane operations. Three cyclopentane/polyol mixing stations will be installed. The foaming areas will be equipped with safety ventilation, gas detectors and fire extinguishing systems. Two cyclopentane tanks, including piping systems will be installed.

6. On the refrigerant side, the existing five charging boards will be replaced with five isobutane charging units. Three helium leak detection systems and six isobutane leak detectors have been requested to replace six existing leak detectors. Three ultrasonic welding systems will be installed replacing conventional soldering systems. The cost of helium leak detection and ultrasonic welding systems is requested taking into account 50 % cost sharing due to technological upgrade. The project is seeking funding for the installation of isobutane storage, handling and piping systems. The proposal includes also costs of safety measures such as gas detection and safety ventilation systems and costs of engineering, commissioning, trials, technology transfer, training and safety inspections and certification. Incremental operating costs for higher costs of chemicals are requested for a period of three months. No incremental operating costs for isobutane compressors are sought.

7. The production of refrigerators and freezers started at Zhejiang Electrical Equipment Co (ZEEC) in 1982. In 1989, additional foaming equipment was installed supplied from Perros, Italy resulting in an increase of the installed capacity to 300,000 units a year. The actual production, however, was 100,000 units and 95,000 units in 1994 and 1995 respectively. In 1996 the company was taken over by Aucma a major producer of freezers in China. No new production equipment was installed but the existing equipment was overhauled, new models have been developed and the quality of product was improved with the result that production was increased to 163,00 units in 1997 and 210,000 units in 1998. The ODS consumption was 168 ODP tonnes of CFC-11 and 34 ODP tonnes of CFC-12. The objective of the proposal is to convert from CFC-11 blowing agent to cyclopentane and CFC-12 refrigerant to isobutane resulting in a total phase out of 202 ODP tonnes. The conversion of the foam part involves the modification of five high pressure foaming machines, three foaming cabinet lines and one door line for cyclopentane operations. Three cyclopentane/polyol mixing stations will be installed. The foaming areas will be equipped with safety ventilation, gas detectors and fire extinguishing systems. Two cyclopentane tanks, including piping systems will be installed.

8. On the refrigerant side, the existing four charging boards will be replaced with five isobutane charging units. Two helium leak detection systems and two isobutane leak detectors have been requested to replace two existing CFC-12 leak detectors. Two ultrasonic welding systems will be installed replacing conventional soldering systems. The cost of helium leak detection and ultrasonic welding systems is requested taking into account 50 % cost sharing due

to technological upgrade. The project is seeking funding of installation of isobutane storage, handling and piping systems. The proposal includes also costs for safety measures such as gas detection and safety ventilation systems and costs for engineering, commissioning, trials, technology transfer, training, and safety inspections and certification. Incremental operating costs for higher costs of chemicals are requested for the period of three months. No incremental operating costs for isobutane compressors are sought.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat has discussed with UNIDO issues related to dates of installation of production equipment and the production levels of both companies. Two of the foaming machines in Moganshan have been purchased second hand from Zhejiang Yuhang and Tianjin Kenai, refrigeration enterprises which have ceased production. The production figures of ZEEC reported in the project proposal have been compared with production data included in the information document presented by the Government of China referred to in Paragraph 1 under Sector Background above. Additional information has been provided by UNIDO, the enterprises and suppliers of equipment to clarify the data reported in the proposals.

2. The Secretariat and UNIDO have examined the layout and configuration of production process in both companies. It was recognized that the conversion could be rationalized and a more cost-effective solution applied in terms of the number of required pre-mixing stations, cyclopentane storage tanks, nitrogen generators and associated piping cost. The requested capital costs for leak detectors and gas detection systems in ZEEC also have been adjusted to reflect accurately the baseline production configuration and the number of units produced. Overall capital costs for the two projects have been adjusted according to the above consideration.

3. Both project proposals request funding of helium leak detection systems in addition to provision of industrial leak detectors designed for isobutane refrigerant. It was recognized that isobutane leak detectors provide the required accuracy for the lower tolerance leakage rate required in isobutane-based cooling systems. This leak detection method is used in developed countries, and has been requested and approved in many hydrocarbon conversion projects, including the German bilateral project approved at the 27th Meeting in China. It was agreed with UNIDO that the cost of helium leak detectors is not eligible for funding. Capital costs have been adjusted in both proposals to reflect the above.

4. All the incremental capital and operating costs have been agreed between the Secretariat and UNIDO.

5. Moganshan Electric Appliances Co. is not included in the list of domestic refrigeration enterprises provided by the Government of China referred to in Paragraph 1 under Sector Background above. Therefore, the project proposal is brought to the Sub-Committee for Project Review for individual consideration.

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the Zhejiang Electrical Equipment Company refrigeration project with the funding levels and associated support costs as indicated below.

	Project Title	Project Funding (US$)	Support Cost (US$)	Implementing Agency
(b)	Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Zhejiang Electrical Equipment Co.	2,189,782	250,876	UNIDO