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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-second Meeting
Ouagadougou, 6-8 December 2000

PROJECT PROPOSALS: CHINA

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

Foam:

- Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology at eight enterprises in Henan Province World Bank
- Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology at eleven enterprises in Chengdu World Bank
- Replacement of CFC-11 with HCFC-141b in manufacturing of PU rigid spray foam for insulation at 26 enterprises UNIDO

Halon:

- 2001 Annual Programme - Halon Sector World Bank

Production:

- 2001 annual program - CFC production sector World Bank

Refrigeration:

- Phaseout of CFC-11 by conversion to cyclopentane technology and CFC-12 by conversion to isobutane (600a) technology in the manufacture of domestic freezers at Qingdao Haier No. 2 Freezer Plant UNDP
- Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Little Swan Electric (Jingzhou) Co. Ltd. UNIDO

Solvent:

- Interim report and request for second payment on the implementation of the 2000-2001 annual programme under the China Solvent Sector Plan UNDP

**PROJECT EVALUATION SHEET
CHINA**

SECTOR: Foam ODS use in sector (1999): 23,145 ODP tonnes

Sub-sector cost-effectiveness thresholds: Flexible slabstock US \$6.23/kg
Rigid US \$7.83/kg

Project Titles:

- (a) Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology at eleven enterprises in Chengdu
- (b) Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology at eight enterprises in Henan Province
- (c) Replacement of CFC-11 with HCFC-141b in manufacturing of PU rigid spray foam for insulation at 26 enterprises

Project Data	Flexible slabstock	Flexible slabstock	Rigid
	Chengdu 11 enterpris	Henan 8 enterprises	26 enterprises
Enterprise consumption (ODP tonnes)	890.00	636.70	978.80
Project impact (ODP tonnes)	890.00	636.70	891.40
Project duration (months)	48	48	30
Initial amount requested (US \$)	4,990,000	3,966,330	6,979,859
Final project cost (US \$):			
Incremental capital cost (a)	6,050,000	4,400,000	2,996,000
Contingency cost (b)	550,000	400,000	299,600
Incremental operating cost (c)	-964,740	-430,226	5,681,498
Total project cost (a+b+c)	5,635,260	4,369,774	8,977,098
Local ownership (%)	100%	100%	100%
Export component (%)	0%	0%	0%
Amount requested (US \$)	4,990,000	3,929,874	6,956,762
Cost effectiveness (US \$/kg.)	5.61	6.23	7.80
Counterpart funding confirmed?	Yes	Yes	Yes
National coordinating agency			SEPA
Implementing agency	IBRD	IBRD	UNDP

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

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1999)	159,452.90	ODP tonnes
- Baseline consumption (average 1995-1997) of Annex A Group I substances (CFCs)	57,818.70	ODP tonnes
- Consumption of Annex A Group I substances for the year 1999	42,983.40	ODP tonnes
- Baseline consumption of CFCs in foam sector	Not available	ODP tonnes
- Consumption of CFCs in foam sector in 1999 ¹	23,145	ODP tonnes
- Funds approved for investment projects in foam sector as of end of 1999	US \$74,695,424.00	
- Quantity of CFC to be phased out in foam sector as of end of 1999	6,946.10	ODP tonnes
- Quantity of CFCs phsed out in investment projects in the foam sector as of end of 1999	4,413.59	ODP tonnes
- Funds approved for investment projects in the foam sector in the year 2000	US \$2,559,851	
- Quantity of CFC to be phased out in foam projects approved in the year 2000	328.50	ODP tonnes

¹ 1999 foam sector consumption data based on information from the project documents.

1. Three umbrella projects, two in the flexible slabstock (19 enterprises) and one in the rigid foam (26 enterprises) sub-sectors are being submitted to the 32nd Meeting. The three umbrella projects are expected to phase out 2,418 ODP tonnes within a period of 30 months and four years for the rigid foam and flexible slabstock foam projects, respectively. The flexible slabstock foam projects are submitted by the World Bank while the rigid foam is from UNIDO. Both UNIDO and the World Bank indicated that the consumption of the foam sector which is the largest in China was 23,145 tonnes of CFC in 1999, of which 19,164 tonnes was CFC-11 and 3,981 tonnes was CFC-12. They also stated that there are currently 67 ongoing projects for the phase out of 5,414 tonnes CFC-11. When the three projects and the projects being submitted to the 32nd Meeting are completed the 1999 consumption will be reduced from 19,164 tonnes to 11,332 tonnes.

2. Resources (US \$300,000) were approved for the World Bank at the 30th Meeting to prepare a foam sector strategy which was to be completed by December 2000. The World Bank in a status report has indicated that due to difficulties in data collection the strategy will be completed by March 2001 and submitted to the 34th Meeting in July 2001. The World Bank also indicated that prior to submission of the foam sector plan to the 34th Meeting China is submitting the two flexible PU and one rigid PU umbrella projects as pilot projects for the sector plan through which it hopes to gain experience for implementation of umbrella projects under the sector plan. The three umbrella projects will be accounted for in the foam sector plan when approved, and will be managed under the 2001 annual programme.

3. The scope of the rigid foam sub-sector will be ascertained only after completion of ongoing in-depth survey of the sub-sector. The flexible slabstock foam enterprises that still remain to be converted are estimated to be about 106 operating 131 production lines, with about 40% of the enterprises consuming over 50 tonnes per year of CFC-11 each while 30% consume 40-50 tonnes per year. All the enterprises consuming over 40 tonnes CFC per year (about 74 enterprises) are expected to request funding for LCD technology.

Flexible Slabstock Foam

- (a) Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology at eleven enterprises in Chengdu**
- (b) Conversion of PU slabstock manufacture from CFC-11 to liquid carbon dioxide technology at eight enterprises in Henan Province**

Chengdu umbrella project and Henan Province umbrella project

4. Two umbrella projects for 19 enterprises producing flexible slabstock polyurethane foam in Chengdu (in Sichuan Province) and Henan Province have been submitted for China by the World Bank. The total CFC-11 consumption of the two projects is 1,527 ODP tonnes. The Chengdu umbrella project includes 11 enterprises with a total CFC-11 consumption of 890 ODP tonnes while the Henan project includes 8 enterprises with CFC-11 consumption of 637 ODP tonnes. The CFC-11 consumption of the individual enterprises in the Chengdu project ranges from 76-86 tonnes with average of 80.9 tonnes, while in the Henan project it is 65-87 tonnes with an average of 79.6 tonnes. All the enterprises except two operate Maxfoam units with outputs between 120 and 320 kg/min. The remaining two Yanshi and Yiyang Juijui in the Henan group operate 120 kg/min Vertifoam machines. The annual foam production of the enterprises range from 800 to 1,960 tonnes.

5. All the enterprises will phase out 100% of the CFC consumption through the use of LCD technology. The total project cost was calculated based on calculation of the cost of each individual production line. Each project includes the cost of replacement of the CFC storage, metering and mixing systems with LCD system at a total cost of US \$550,000. This includes LCD system (US \$360,000), high pressure pump system (US \$60,000), bulk storage tank refrigeration system (US \$45,000), trials (US \$15,000) and technical assistance (US \$10,000). Each project also includes technology license fee of US \$50,000. The total incremental operating savings of the Chengdu and Henan projects are US \$964,740 and US \$430,226 respectively. The operational savings of the individual enterprises as well as their other characteristics are provided in Tables 1 and 2.

Implementation of the projects

6. The Government of China and the World Bank propose to use the two umbrella projects as pilot projects for the phase out of CFC in the remaining flexible slabstock foam producing enterprises. A merger of the 11 enterprises in the Chengdu umbrella project into one group company with industrial restructuring is foreseen. Similarly, the eight enterprises in the Henan

umbrella project are considering merging into one group company and conduct industrial restructuring as well. Both the Government and the enterprises believe that industrial restructuring could be a better phase out instrument. Consequently, the World Bank's project monitoring milestones indicate that prior to signing grant agreements with enterprises in the two groups, establishment of the group companies will be carried out as indicated below:

Chengdu Group Company

Establishment of Chengdu Group Company	May 2001
Grant agreement submitted to beneficiary	July 2001
Grant agreement signature	October 2001

Henan Group Company

Establishment of Henan Group Company	December 2001
Grant agreement submitted to beneficiary	April 2002
Grant agreement signature	May 2002

7. The World Bank states that as the enterprises will have to finance 24% and 17% of the total capital cost of the Chengdu and Henan projects, respectively, China requests maximum flexibility in implementing the umbrella projects in the most efficient way to ensure that the phase out target (in terms of ODP) are met, all baseline ODS equipment listed in the project summary are rendered unusable or destroyed and not transferred to other foam plants, and CFC foam will no longer be produced at project completion. This flexibility will allow the Chengdu and Henan enterprises to conduct industrial re-structuring which both the Government and the enterprises believe could be a better phase out instrument.

8. The two umbrella projects are scheduled for completion in December 2004 although commissioning and trials are expected to be completed in October 2003 and September 2003 at Chengdu and Henan respectively.

Rigid Foam

(c) Replacement of CFC-11 with HCFC-141b in manufacturing of PU rigid spray foam for insulation at 26 enterprises

26 enterprises (umbrella project)

9. The 26 enterprises in the umbrella project consumed a total of 978.8 ODP tonnes (average 1996-1996). The project will phase out 891.1 ODP tonnes. The factories included in the project were preselected by SEPA through an ongoing inventory of the sub-sector. They produce rigid polyurethane foam for various applications mainly spray insulation foam, sandwich panels and pre-formed pipe sections. The enterprises use predominantly locally made low pressure spray or pouring foam machines. A total of 111 machines are used by the 26 enterprises including 61 sprayfoam machines of 4-13 kg/min capacity and 50 pouring machines of 10-150 kg/min capacity. 26 of the 111 machines used by the enterprises were installed between February and 15 July 1995 and the rest between 1990 and 1994.

10. 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 61 locally made low pressure sprayfoam and low output pouring machines with high pressure sprayfoam machines at the cost of US \$18,000 each, replacement of the high output low pressure machines at US \$80,000-US \$85,000 each and replacement of one open-top batch premixer at US \$20,000. Other capital costs include retrofit cost of two Chinese-made high pressure machines at US \$8,000 and US \$10,000 and retrofit of two Glascraft sprayfoam dispensers at US \$7,500, trial costs of US \$2,000-US \$10,000 per enterprise depending on the number of equipment and product lines, technology transfer and training of US \$5,000-US \$8,000 per enterprise.

11. UNIDO also stated that the umbrella project when approved, will be used as a pilot project for the implementation of future projects in the rigid foam sub-sector. The profile of the enterprises in the umbrella project is provided in Table 3.

Justification for the use of HCFC-141b

12. UNIDO indicated that its technical experts visited the enterprises prior to preparation of the project documents in June/July 2000 and had discussions with them about the choice of technology for replacing CFC-based technology. The enterprises were briefed in detail about the available technological options. On the basis of the briefings HCFC-141b was chosen as interim technology until new developments in water-based or HFC-based technologies allow the use of zero ODP technology. A summary of the briefings entitled "Technology Selection Statement" is attached as an annex to this evaluation, together with the letter of the Government endorsing the use of HCFC-141b by the enterprises.

Impact of the projects

13. A total of 2,418.1 ODP tonnes will be phased out when the projects are completed. This will phase out 4.4% of its 1998 consumption of Annex A Group I substances or 10.4% of its 1999 foam sector consumption of these substances. There will be residual consumption of 87.4 ODP tonnes.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Flexible slabstock

1. The Fund Secretariat discussed various aspects of the projects with the World Bank bearing in mind China's intention to use the umbrella projects as pilot projects; these included the cost structure, the implementation time frame of four years, and the proposed amalgamation of the companies into two single entities, the request of the Government of China for maximum flexibility in the implementation of the projects and the licensing fees.

Implementation time frame

2. With regard to the time frame it was observed from the project monitoring milestones that the length of time of four years for completing the projects is partly due to the time it would take for the proposed mergers and restructuring of the enterprises to take place. This is about 6 months in the case of the Chengdu group and 1 ¼ years for the Henan group. This also confirms that the mergers and the restructuring indicated in the project documents will actually take place.

Amalgamation of the enterprises and restructuring of their production

3. Analysis of the production output of the individual enterprises shows that as capacity utilization of the enterprises is low (about 10-15%) there exists in every plant excess capacity which would call for industrial rationalization after the mergers of the enterprises into group companies. In the flexible slabstock foam sub-sector due to intrinsically low equipment usage relative to installed capacity industrial restructuring should result in closure of some production capacity (lines). The Secretariat therefore advised the World Bank that it might be appropriate to submit the project after the expected restructuring of the companies had been completed and the actual numbers of production lines to be converted by each group company are known. This is relevant since the capital cost of conversion for flexible slabstock foam production lines is independent of the CFC consumption or foam output and as the project costs are calculated on production line by production line basis. The World Bank responded by expressing uncertainty about the implementation of the projects, whether by industrial restructuring as described earlier or by each enterprise on its own, although the implementation concept remained unchanged in the projects. Although the World Bank indicated that existing capacity will be maintained, it is not the capacity but the number of production lines that determines the extent of the costs of the project.

Request to the Executive Committee by China for maximum flexibility in the implementation of the projects

4. The Secretariat could not recommend this request of the Government of China to the Executive Committee for the following reasons:

- (a) The cost of each umbrella project was calculated on the basis of the number of individual production lines.
- (b) Industrial rationalization which could result in reduction of production lines will take place only after the approval of the projects and their funding levels, and so the Committee may not be in a position to determine whether the approved grant represented the eligible cost of phase out.

Technology License Fees

5. The Secretariat advised the World Bank, consistent with Decision 17/4 regarding rationalization of technology transfer fee of groups of projects using similar technology, to negotiate the best possible terms for the license fee (US \$50,000 per enterprise) for the projects. The total amount of licensing fee for the two projects is US \$950,000 and will increase as projects are prepared for most of the remaining 106 enterprises. The World Bank gave assurance that this will be done. However, it added that unused funding for license fee for Henan should be returned, while only savings exceeding US \$645,260 for Chengdu should be returned. Analysis of the project costs (see table 1) shows should this may not be the case. The World Bank should be requested to report to the Executive Committee whatever agreement it reaches with the technology suppliers on the reduction of the license fee.

Project costs

6. The project costs as calculated based on the individual enterprises or production lines is consistent with the applicable rules and have been agreed as calculated.

Conclusion

7. The projects are being submitted for individual consideration on account of the issues discussed above.

8. The Executive Committee may wish to consider requesting the Government of China to encourage the enterprises concerned to expedite the restructuring process and subsequently negotiate funding for the conversions based on the results of the industrial rationalization as well as negotiations of the license fees. This would require withdrawal of the two projects and resubmission at a later date. This approach may not affect the eventual project completion date as the industrial rationalization foreseen in the current project proposals would in itself delay the projects' implementation even if they were approved as they are.

Rigid foam

9. The Secretariat and UNIDO have agreed on the incremental capital costs. However the incremental operating costs are still under discussion, particularly with regard to the chemical prices used in their calculation. The outcomes of the discussion will be communicated to the Sub-Committee on Project Review.

Table 1: Profile of Enterprises in the Chengdu Umbrella Project (Flexible Slabstock Foam)

Enterprise	ODS Use Tonnes Av. 1997-1999	Equipment	Date Installed	Output kg/min	Installed Capacity* Tonnes	Foam Produced Av. 97-99 Tonnes	ICC** US \$	IOC/(IOS)*** US \$	Total Cost US \$	Requested Grant US \$	Cost-effectiveness US \$/kg
Chengdu Duocai	76	Maxfoam	Apr 93	225	16,200	848	600,000	(75,593)	524,407	475,536	6.23
Huiyu Co.	86	Maxfoam	Apr 94	220	15,840	957	600,000	(100,228)	499,772	499,772	5.83
Hongyang	76	Maxfoam	Apr 95	220	15,840	835	600,000	(69,384)	530,616	471,424	6.23
Luili	80	Maxfoam	Mar 93	150	10,800	891	600,000	(84,349)	515,651	500,456	6.23
Wantjiang	82	Maxfoam	Mar 95	225	16,200	906	600,000	(95,201)	504,799	504,799	6.18
Yongsheng	84	Maxfoam	15 Jul 95	225	16,200	930	600,000	(91,781)	508,219	508,219	6.07
Yunde	89	Maxfoam	Apr 95	200	14,400	985	600,000	(108,356)	491,644	491,644	5.54
Quianjin	79	Maxfoam	Mar 95	220	15,840	876	600,000	(76,041)	523,959	492,170	6.23
Dongzikou	79	Maxfoam	Jan 94	150	10,800	878	600,000	(97,710)	502,590	494,226	6.23
Xindu	84	Maxfoam	May 95	150	10,800	936	600,000	(94,387)	505,613	505,613	6.02
Jinjiang	76	Maxfoam	May 94	220	15,840	797	600,000	(71,710)	528,290	471,424	6.23
Total	890				158,760	9837	6,600,000	(964,740)	5,635,560	5,415,283	5.61

Table 2: Profile of Enterprises in the Henan Umbrella Project (Flexible Slabstock Foam)

Enterprise	CFC Consumption Av. 1997-1999	Equipment	Date Installed	Output kg/min	Installed Capacity* Tonnes	Foam Produced Tonnes Av. 1997-1999	ICC** US \$	IOC/(IOS)*** US \$	Total Cost US \$	Requested Grant US \$	Cost-effectiveness US \$/kg
Yanshi Foam Plant	86.0	Vertifoam	Nov 93	120	8,640	1,691	600,000	(53,180)	546,820	535,780	6.23
Zhengshou Dev. Zone	79.3	Maxfoam	Jan 94	300	21,600	1,786	600,000	30,793	630,793	494,226	6.23
Huizian Zijinshan	84.3	Maxfoam	Feb 94	250	18,000	1,461	600,000	(98,992)	501,008	501,008	5.94
Yiyang Juijui	85.3	Vertifoam	Mar 93	120	8,640	1,592	600,000	(80,481)	519,519	519,519	6.09
Luoyang Jinling	87.3	Maxfoam	Mar 94	320	23,040	1,957	600,000	(5,457)	594,543	544,066	6.23
Wazhi Fuli	73.7	Maxfoam	Nov 91	250	18,000	1,114	600,000	(58,584)	541,416	458,964	6.23
Shangqiu	75.3	Maxfoam	Jun 93	200	14,400	1,158	600,000	(97,070)	502,930	469,306	6.23
Shangqiu Yongfeng	65.3	Maxfoam	Mar 95	250	18,000	1,144	600,000	(67,255)	532,745	407,006	6.23
Total	636.7				130,320	11,903	4,800,000	(430,226)	4,369,774	3,929,874	6.17

* Installed capacity calculated on the basis of 6 hour working day for 200 days.

** ICC – incremental capital cost, including 10% contingency and US \$50,000 licensing fee.

*** IOC/(IOS) incremental capital cost/savings

Table 3: Profile of the 26 Rigid Foam Enterprises

Enterprise	CFC-11 use ODP tonnes	Project impact ODP tonnes	ICC US\$	IOC US\$	Total Project Cost * US\$	Baseline Equipment***	Requested Grant US\$	Total cost to MLF US\$ **	Cost effect.
1 Jiangsu Jieda Chemical New Technology Developing Company	63.52	57.88	181,000	381,490	580,590	5 SPD, 1 LPD	453,210	512,127	7,830
2 Zhoushan Putuo Huayuan Chemical Co. Ltd.	43.96	39.98	62,000	272,730	340,930	3 SPD	313,057	353,754	7,830
3 Puyang Zhongbai Chemical Co. Ltd.	46.33	42.06	106,000	292,939	409,539	1 SPD, 1 LPD	329,368	372,186	7,830
4 Puyang Shiqu PU Material Plant	26.66	24.25	128,000	163,052	303,852	2 SPD, 1 LPD (H)	189,892	214,578	7,830
5 Puyang Changfa Anti-corrosion & Insulation Engineering Co. Ltd.	12.52	11.41	62,000	73,579	141,779	3 LPD (L)	89,353	100,969	7,830
6 Hejian Zhongke Anti-corrotrion & Insulation Engineering Co.Ltd.	58.96	53.31	139,000	382,138	535,038	2 SPD, 2 LPD (H)	417,434	471,701	7,830
7 Dacheng Youlian Chemical & Building Material Company	20.19	18.33	128,000	125,818	266,618	2 SPD, 2 LPD (H)	143,544	162,204	7,830
8 Qingdao Jinbeiyang Engineering Co. Ltd	61.54	56.35	84,000	351,238	443,638	4 SPD	441,221	498,580	7,830
9 Haicheng Antisepsis and Insulating Engineering Co. Ltd.	40.00	37.30	148,000	203,533	366,333	6 SPD, 1 LPD (L)	292,067	330,036	7,830
10 Shenyang Liaowu Antisepsis and Insulating Engineering Department	36.89	33.70	62,000	172,559	240,759	3 SPD	240,759	272,057	7,145
11 Shenyang PU Technology-Industry-Trade Co. Ltd.	23.37	20.81	64,000	138,046	208,446	4 SPD	162,946	184,129	7,830
12 PU Development Co. Ltd.	15.13	14.05	44,000	73,655	122,055	3 SPD	110,027	124,331	7,830
13 Shenyang Yixing PU Trial Plant	11.52	10.44	62,000	58,347	126,547	5 SPD	81,709	92,331	7,830
14 Liaohe Oil Exploration Bureau	112.73	103.18	362,000	655,160	1,053,360	25 LPD (L)	807,876	906,742	7,830
15 Bejin Huiyuan Tech. Development Company	55.08	50.34	177,000	341,860	536,560	4 SPD, 1 LPD (H), 1 HPD	394,178	445,422	7,830
16 Beijing Zhonghao Trade Company	38.50	35.34	131,000	215,979	360,079	2 SPD, 1 LPD (H)	276,720	312,694	7,830
17 Jizhoushi Xinxing Insulating Material Factory	43.33	39.27	177,000	253,225	447,925	2 SPD (HP), 4 SPD, 1 LPD (H)	307,499	347,474	7,830
18 Dachengxian Zhenhua Polyurethane Plant	32.50	29.46	124,000	188,499	324,899	1 SPD, 1 LPD (H)	230,672	260,659	7,830
19 Hejian Dongfeng Polyurethanes Plant	35.61	32.28	103,000	206,538	319,838	1 SPD, 1 LPD (H)	252,752	285,610	7,830
20 Hebei Hejian Jinwei Rubber & Plastics Co. Ltd.	31.25	28.33	144,000	181,251	339,651	1 SPD, 1 LPD (H)	221,824	250,661	7,830
21 Hejian Shuntong Polyurethanes Plant	27.90	25.29	134,000	161,804	309,204	2 SPD, 2 LPD (H)	198,021	223,763	7,830
22 Jinan Beijiao Thermal Power Plant	13.12	11.89	93,000	57,056	159,356	3 LPD (H)	93,099	105,202	7,830
23 Jinan Taiya Polyurethanes Co. Ltd.	44.67	40.49	115,000	259,260	385,760	3 SPD	317,037	358,251	7,830
24 Shandong Dongda Chemical Industries Co. Ltd.	40.64	36.84	64,000	220,997	291,397	1 SPD, 1 LPD (H)	288,457	325,957	7,830
25 Shandong Huangming Solar Energy Co. Ltd.	30.69	27.82	38,000	177,965	219,765	1 SPD	217,831	246,149	7,830
26 Zhaoyuan Polyurethanes Co. Ltd.	12.15	11.01	64,000	72,782	143,182	6 SPD, 1 LPD (H)	86,208	97,415	7,830
Total 26 Enterprises	978.78	891.43	2,996,000	5,681,498	8,977,098		6,956,762	7,854,983	7,804

* Includes 10% contingency

** Includes support cost

*** SPD - low pressure sprayfoam dispenser (mostly China Lequing dispenser)

SPD (HP) -high pressure sprayfoam dispenser (mostly Glascraft)

LPD (L) - low pressure dispenser, low output (10kg/min)

LPD (H) - low pressure dispenser, high output (60-150kg/min)

HPD - high pressure dispenser

Annex

Technology Selection Statement

UNIDO technical experts have visited the enterprises of this project prior to preparation of the project documents in June/July 2000 and had discussion with the companies about the choice of technology for replacing CFC-based technology. The enterprises were briefed in detail about the following:

- An overview of available interim (low ODP) and permanent (zero ODP) replacement technologies;
- The “techno-economic impact” of each technology on the products manufactured and the process and practices employed;
- Possible implications of each technology in terms of its impact on environment, health and safety, ozone depleting potential, global warming potential, etc;
- It was emphasized to the companies that HCFC technologies are interim technologies due to their residual ODP and therefore may continue to adversely affect the environment, although at a lower rate than CFC’s.

The main conclusions reached by the enterprises through the discussions with UNIDO’s technical experts were as follows:

- The use of HCFC-141b is the only currently feasible option for the rigid spray PU foam production;
- Water blown technology at this point results in a product that could not be sold commercially, its density increases by 20-30% with a reduction in insulation value of 35-40%;
- The companies are not prepared, as per today, to operate with inflammable and explosive materials;
- Many types of mechanical works, including welding are carried out in the production buildings as well as “on site” services at the customers premises restricting application of flammable blowing chemicals.

In view of the above among the available HCFC-141b based systems is selected as the interim technology until new developments (water or HFC-based systems) allows the use of zero ODP technologies.

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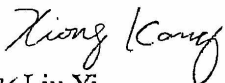
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Date: 2000/10/8	No. of Pages: 1 (Including this cover sheet)
To: Name: Mr. Yalchidag Acting Director Organization: UNIDO Fax No.: 43(1)26026-3939/6804	From: Name: Mr. Liu Yi Deputy Director-general Dept.: FECO,SEPA,China Fax No.:86-10-66151776

**Subject: GOVERNMENT REVIEW AND ENDORSEMENT OF
USING HCFC-141B**

According to the ExCom Decision 27/13, on behalf of the Government of China, I hereby endorse as following:

1. SEPA has reviewed the specific situations involved with the projects as well as its HCFCs commitments under Article 2F;
2. It has nonetheless determined that, at the present time, the projects need to use HCFCs for an interim period;
3. It understands that no funding would be available for the future conversion from HCFCs for these companies.


for Liu Yi
Deputy Director General
FECO/SEPA
People's Republic of China

**PROJECT EVALUATION SHEET
CHINA**

SECTOR: Halon ODS use in sector (2000): 3,980ODP tonnes (production)

Sub-sector cost-effectiveness thresholds: N/A

Project Titles:

(a) 2001 Annual Programme - Halon Sector

Project Data	Halon Sector
Enterprise consumption (ODP tonnes)	
Project impact (ODP tonnes)	
Project duration (months)	
Initial amount requested (US \$)	4,500,000
Final project cost (US \$):	
Incremental capital cost (a)	
Contingency cost (b)	
Incremental operating cost (c)	
Total project cost (a+b+c)	
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US \$)	0
Cost effectiveness (US \$/kg.)	
Counterpart funding confirmed?	
National coordinating agency	
Implementing agency	IBRD

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

PROJECT DESCRIPTION

(a) The Halon Sector 2000 Annual Program

1. In accordance with the Executive Committee's approval of the Sector Plan for Halon Phase out in China (Decision 23/11), China is requesting release of the fourth tranche of US\$4.5 million for the implementation of the year 2001 Annual Programme. With this funding, China halon 1211 production will be reduced to a maximum of 3,317 MT and its consumption to a maximum of 3,117 MT in 2001. 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 annexed to this document. The 2001 Annual Program includes the following activities:

- a) US\$1.6 million to be used for buying back quotas and as a result closing 2-3 halon agent producers;
- b) US\$2.1 million to be used for closing and converting 7-10 fire extinguisher manufacturers;
- c) US\$0.4 million to be used for converting 2-3 fire extinguishing system manufacturers; and
- d) US\$0.4 million to be used for technical assistance activities in order to support the halon phase out programme and ensure that existing fire protection requirements can be met.

2. The Government of China will continue to implement bidding for closure/conversion contracts for halon phase out activities and the tradable production quotas, and to strengthen the ban on new installation of halon extinguishers for non-essential uses through, inter alia, a gradual tightening of the definition of essential uses. The ban on non-essential uses will also be implemented through: the dissemination of the details of the ban to prospective consumers through the news media, bulletins, etc.; the inspection by fire bureaux and environmental protection bureaux; requiring regular reports from local bureaux to the Ministry of Public Security (MPS) and the National Environmental Protection Agency (NEPA); and strict control of the sale of halons.

3. Technical assistance activities planned for the year 2001 include: Design Code for Water Mist Fire Extinguishing Systems, Revision of Design Code for Installation of Fire Extinguishers in Buildings, Feasibility Study on Substitutes for Halon Fixed Fire Extinguishing Systems; Studies of Market Prospect for Closure Enterprises; Training of Personnel Involved in Phase out Activities.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

4. 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. The reductions indicated in the 2001 Annual Programme correspond to the established schedule.

Technical audit

5. 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).

Late Submission of Audit Results

6. Due to the Bank's late initiation of the audit of the 1999 reductions, the Secretariat extended the due date for the submission of the results by two weeks. On 27 October, the Bank informed the Secretariat that the audit might not be available until 15 November, one week after the due date for the dispatch of documents to the Executive Committee. As in last year, the results of the audit were submitted too late to enable either a review by the Secretariat in advance of the dispatch of documents or a review by the Committee based on information in the meeting documents.

First Annual Independent Technical Audit under Paragraph D of Decision 23/11

7. Unlike last year, this year is the first year that an independent technical audit was commissioned since the approval of the China Halon Plan in October 1997. The Executive Committee approved the technical audit as part of the World Bank's support costs for the 2000 annual work programme (Decision 29/58). Paragraph D of Decision 23/11 states that "China also agrees to allow for annual independent technical audits administered as directed by the Executive Committee to verify that annual halon production and consumption levels agreed in paragraphs (a), (e) and (f) are actually being met".

Confirmation of Reductions Required by Decision 23/11 under Paragraph C

8. The Secretariat informed the Bank that without the confirmation of that reductions have been made through the required independent technical audit, the Secretariat was not in a position to provide a positive recommendation for the release of funds. The Bank indicated that requiring the results of a technical audit for the release of funds at this meeting changes the agreement with China which is not allowed under Paragraph M of Decision 23/11 that states that "the funding

components of this decision shall not be modified on the basis of future Executive Committee decision that may affect the funding of the halon sector”.

9. The Bank indicated that since it provided a desk review conducted by the firm conducting the independent technical audit that the obligations required as a condition to the release of funds as specified in paragraph C of Decision 23/11 had been fulfilled.

Desk Study

10. A desk study was provided with the submission of the 2001 Annual Plan. It concluded that within the limitations of the scope of work of the desk study, it did not identify information that contradicted that the required reductions in production and consumption in 1999 were achieved. The purpose of the desk review was to provide the World Bank “with a certain level of assurance regarding the level of production and domestic consumption of halon in China in 1999”. The study and its conclusions were based on audit reports from China’s National Audit Office, the Zhejiang Provincial Audit Office, the halon sector annual programmes, and memos/faxes to the World Bank personnel.

11. The desk study raised the following issues: the need for a different monitoring and audit approach for the Zhejiang plant due to its specific business circumstances; the need for improvement of monitoring and controlling consumption data due to the inherent risk that the level of accuracy of data for domestic consumption is low; and that the production and sales of the by-product halon 1202 should be included in the audit and reporting because at least 3 plants had sold halon 1202 in 1995 and that it was more profitable to sell it than to recycle it for the production process for conversion to halon 1211.

12. The special audit for Zhejiang is due to the fact that it produces both halon 1211 and halon 1301 on the same production line, consequently halon 1211 is produced about four months per year and the company has large stocks of halon 1211. Despite the stocks, the company also buys and resells halon 1211 from other producers.

13. This issue is related to the issue about the accuracy of consumption data. In the light of the fact that consumption for the purpose of the agreement is based on the formula: consumption = production plus imports minus exports, it is essential to have good records of the level of exports, imports, and internal transfers of halon from one producer to another or from producer to exporter. The World Bank indicated that since the desk review, the necessary documentation was provided and only documented export was included in the export figures.

14. The technical audit that is currently underway in China will audit and report, once completed, on the production and sales of halon 1202.

Halon fire extinguisher closure/conversion targets and achievements

15. The annual programmes of the China Halon Plan indicate the targeted number of fire extinguisher manufacturers that are expected to receive contracts. The following table provides

the World Bank's targets and achievements based on the targets in the plans and the achievements reported in the 2001 Plan.

Annual Programme	Targeted Companies to Receive Contracts	Number Receiving Contracts for Closure or Conversion	Number of Companies Left to Receive Contracts	Actual Completion*	Actual Number of Companies Left to be Converted or Closed as of the end of the Plan
1997 Sector Plan			72		72
1998 Annual Plan	20-25	16	56		72
1999 Annual Plan	10-14	11	45	10	62
2000 Annual Plan	33-37	13	32	8	54
2001 Annual Plan	7-10	N/A	N/A	22	32

* The number of companies whose planned closure or conversion in the year 2001 is based on contracts approved through 2000.

16. The World Bank indicated that the target for a previous year (it appears the year 2000) was in error.

RECOMMENDATIONS

1. The Executive Committee may wish to take the above into consideration in its determination of the approval of the 2001 work programme of the China Halon Plan and when to release the funds for its implementation.

CHINA

THE HALON SECTOR

2001 ANNUAL PROGRAM

October 8, 2000

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The Halon Sector 2001 Annual Program

Background

1. In accordance with the Executive Committee's approval of the Sector Plan for Halon Phaseout in China (UNEP/OzL.Pro/ExCom/23/68), China is hereby requesting release of the fourth tranche of US\$4.5 million for implementation of the year 2001 Annual Program. With this funding, China halon 1211 production will be reduced to a maximum of 3,317 MT and its national consumption to a maximum of 3,117 MT in 2001. The halon 1301 production will be maintained at the agreed maximum level of 618 MT and the national consumption will not exceed a maximum level of 300 MT. Details of the annual program are in Part B.

2. Since the approval of the China Halon Sector Strategy at the 23rd meeting of the ExCom and release of funding for the first (1998) Annual Program, China has started implementation of the Halon Sector Phaseout Strategy. From the start of the program, China has developed supporting policies and regulations. From an initial total of 14 halon plants, 8 halon 1211 production plants have been closed and dismantled completely and production and capacity has been reduced at the six remaining halon 1211 production plants. Out of a total of the 72 halon fire extinguisher manufacturers, 7 enterprises have signed contracts to close their extinguisher production, and 30 enterprises have signed contracts to convert their production fire extinguishers from halon to non-ODS extinguishers. 17 of the 37 enterprises have completed closures/conversions, and the rest are implementing their conversions. At the end of 1999, the total impact of the contracts for completed conversion or closure projects for extinguishers and systems was 2,731 MT of halon 1211. Out of a total of the 22 halon fire fighting systems manufacturers, three enterprises have signed contracts to convert their systems from halon to non-ODS extinguishers; one has been completed, and two are implementing their conversions. In 1999, the national consumption of halon 1211 was 5248 MT. There are 35 other fire extinguisher manufacturing enterprises and 19 fire extinguishing systems manufacturing enterprises which have not yet started conversion. A total of 20 technical assistance activities have started implementation, including activities for strengthening implementation capacity, and preparation of standards to ensure quality and reliability of halon substitute fire extinguishers and fire extinguishing systems.

3. The national production level of halon 1211 allowed for 2000 is 3,980 MT, a reduction of 1,990 MT from the allowable production level of 5,970 MT in 1999. As compared to the actual production level in 1997, the total production reduction of halon 1211 will be 7,664 MT from 1997 to the end of 2000. Production of halon 1301 has been capped at 618 MT, equal to halon 1301 production level in 1997. Detailed implementation status is provided in Part A.

4. As far as the other halons are concerned, halon 1202 is generated as a by-product during the production of halon 1211. According to information provided by the four largest halon 1211 producers, the amount of halon 1202 generated averages between 20 and 30 kg per ton of halon 1211 produced. This amount is captured in closed tanks, and is fed back into the production process of 1211 in a closed system. Halon 1202 is neither vented, nor sold. The Ministry of Public Security (MPS) has also promulgated a regulation to ban the sales of halon 1202 in the market. The halon sector team set up by SEPA is confident that, based on their investigations, there is no halon 1202 sold in the market. China has never produced halon 2402, and has never had plans to do so. In accordance with national regulations, a new halon 2402 production facility would require a new production license, and such a license can no longer be obtained because of a ban on setting up new halon production facilities or expanding existing halon production facilities.

5. These phaseout results have been achieved through the 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. The experience of implementation has confirmed the necessity of strong policy enforcement and monitoring of the halon phaseout program. Because of the number and geographical distribution of the enterprises involved, the success of the program depends to a large extent on the cooperation and support from provincial and local Environmental Protection Bureaus and Fire Fighting Bureaus. For this reason, training and public awareness continue to be key elements in the halon sector plan implementation.

6. While halon phaseout is important for meeting China's commitments to the Montreal Protocol, an assured and adequate supply of alternative fire extinguishing agents and fire fighting equipment is essential for ensuring that the national fire protection and fire fighting capacity are maintained. With the rapid reduction of halon 1211 supply, special initiatives have been taken to strengthen the supply of ABC powder, foam and CO₂ 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 CO₂ cylinders. In addition, a special initiative is being taken up to provide testing equipment to test plant protein foam, a new fire-fighting alternative to halons developed indigenously in China.

Halon Production and Consumption

7. The production and consumption of halons in China after the start of the halon sector plan has been as follows:

Table I: Annual Production and consumption of Halons under the Sector plan

	Halon 1211				Halon 1301			
	Production		consumption		Production		consumption	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
1997	9,950	11,644	NA	10,849	NA	618	NA	NA
1998	7,960	7,842	7,160	7,218	618	450	300	-152*
1999	5,970	5,965	5,370	5,248	618	484	300	299
2000	3,980		3,580		618		300	
2001	3,317		3,117		618		300	
2002	2,654		2,654		600		150	
2003	1,990		1,890		600		150	
2004	1,990		1,890		600		150	
2005	1,990		1,990		600		150	
2006	0	0	0		150		100	
2007	0	0	0		150		100	
2008	0	0	0		150		100	
2009	0	0	0		150		100	
2010	0	0	0		0			

*: The consumption of -152MT of Halon 1301 reflects the export of 602MT, which includes part of the stock (328MT) from the previous year's production. Therefore, the total consumption in 1998 (Consumption = Production + Import - Export) is negative.

Consumption on this table was determined in accordance with the ExCom approval conditions as total annual production plus imports, minus exports. China has reported that no other halons were produced in China, including halon 1202 and halon 2402.

Part A

Implementation Status Of Previous Annual Programs

Status of 1998 Annual program

8. **Phaseout targets and objectives.** The phaseout target for the 1998 Annual Program was (a) to reduce halon 1211 production from the level of 9,950 MT to a maximum of 7,960 MT and consumption to a maximum of 7,160 MT and (b) to maintain halon 1301 production at a maximum of 618 MT and consumption at a maximum of 300 MT. 1998 actual production of halon 1211 was 7,842 MT and actual consumption was 7218 MT. The halon 1211 domestic consumption exceeded the agreed level, as exports of halon 1211 turned out to be lower than expected, and this was discovered only when the export figures became available in the beginning of 1999. The halon 1301 production was reported to be 450 MT and consumption to be -152 MT. It reflects the export of 602MT, which includes the part of the stock from the previous year's production. As the consumption is defined as: production+import-export, the consumption figure becomes negative. The China National Auditing Office (CNAO) had audited the 1999 production and consumption data and found them accurate.

9. **Implementation of policy instruments.** The production quota regulation became effective in December, 1997. The national 1998 halon quota was issued and each producer was assigned a halon 1211 1998 production quota and one producer was assigned the halon 1301 production quota. The data reported by the producers was verified by SEPA and MPS.

Enterprise-level phaseout activities

10. **Closure halon production facilities.** All contracts were signed with bid winners who 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.

11. **Closure & conversion of halon fire extinguisher & system manufacturers.** Contracts were signed with 15 extinguisher and one system manufacturers for a reduction halon 1211 consumption of 2,617 MT. Two extinguisher manufacturers had selected closure and the other selected conversion. All had completed their closure and conversion activities in early 2000 and were commissioned by SEPA and MPS. Details are in Annex II.

Technical Assistance (TA) Activities

12. All TA projects have been completed. The Chinese project team has completed the draft code on the design code of gaseous fire extinguishing system at the end of 1999, but the National Standard Bureau has not yet confirmed the draft code yet. The "halon management plan - provincial demonstration center" undertaken by Guangdong fire fighting bureau has been commissioned, while the other TA activities will be commissioned by the end of 2000. Details are in Annex III.

Status of 1999 Annual Program

13. **Phaseout targets and objectives.** The phaseout target for the 1999 Annual Program was (a) to reduce halon 1211 production from the actual production level of 7,842 MT to a maximum of 5,970 MT and consumption to a maximum of 5,370 MT and, (b) to maintain halon 1301 production at a maximum of 618 MT and consumption remain at 300 MT. Halon 1211 production was reported to be 5,965 MT and consumption to be 5248 MT. Halon 1301 production was reported to be 484 MT and consumption to be 299 MT. All were below the level allowed in the approval conditions of the Sector Plan. The CNAO had

audited the production and consumption data and verified their accuracy.

14. Another main objective of the Halon Sector Plan is to ensure that the level of fire protection capability in China is not compromised through halon phaseout activities, and that suitable quality substitutes are available in sufficient quantities.

15. **Implementation of policy instruments.** The quota system is the main tool for the implementation of the halon phaseout. It is supported and enforced fully by MPS. MPS has simultaneously strengthened its enforcement of the regulation on use of halon 1211 fire extinguishers, which has further reduced the demand for halon 1211. The halon 1211 quotas for halon exporting enterprises are now administratively split up into production quotas for domestic consumption and for export. Three halon producers who are allowed to export halon directly, (Zhejiang Chemical Industry Research Institute Plant, Zhejiang Dongyang Chemical plant and Shangdong Shouguang Fire-Extinguishing Agent Plant), have all received their annual halon 1211 production quotas divided into separate quota allocations for domestic consumption and for export. Utilization of the export component requires proof of export orders.

Enterprise-level phaseout activities

16. **Closure of halon production facilities.** Contracts were signed with 4 bid winners. The total halon 1211 quota reduction effected was 1,942 MT, thereby staying within the 1999 national halon 1211 allowable production level of 5,970 MT. One producer stopped its halon production before January 1, 1999, and its production facilities were dismantled and equipment was completely destroyed by March 1999. The three other producers signed quota reduction contracts and their production stayed within their production limit. Details are in Annex I.

17. **Closure and conversion of halon fire extinguisher & system manufacturers.** Contracts were signed with 10 halon extinguisher and one system manufacturers selected through a bidding process for a reduction of halon 1211 consumption of 1,317 MT. In this program, 2 extinguisher manufacturers selected closure and the other 9 selected conversion. The 2 closure projects have been completed and passed the acceptance requirements of China. Most of the conversion activities have also been carried out. Details are in Annex II.

Special initiatives

18. **ABC dry chemical powder.** The shortage of suitable quality ABC powder is posing a problem. The implementation of the first two years of the Halon Sector Phaseout Plan has resulted in the phaseout of production of about 6,000 MT of halon 1211, greatly increasing the market demand for halon substitutes. ABC dry powder has been identified as one of the main substitutes. Steps have been taken to address the low production levels of ABC dry powder at the Beijing Fire Fighting Agent Factory, which was experiencing low output because of a combination of technical problems, enterprise management issues, and market penetration constraints of the costlier higher quality ABC dry powder when compared to the lower prices of existing Chinese ABC and BC dry powder. SEPA and MPS are trying to address these issues.

19. To maintain the required level of fire fighting capacity in China, it also became necessary to establish an additional ABC dry powder production line with an annual capacity of 3,000 MT. The Foshan Electro-chemical General Plant was selected for installing this capacity, and has already received all the required equipment for the ABC production line at the plant site by May 2000. Foshan is presently carrying out trial production on the production line and it is expected that the commercial production of ABC powder will start by October 2000.

20. **Light weight high pressure CO₂ cylinders.** The need for light weight high pressure CO₂ cylinders is another concern which was addressed in the 1999 Annual Program. Domestically manufactured

CO₂ fire extinguishers do not meet international standards in terms of production technology and the quality of steel used. Weifang Dongming Fire-fighting Equipment Co.Ltd was selected to set up such a production line, and a feasibility study has been undertaken to examine the financial and technical parameters of establishing the production line of light weight CO₂ cylinders.

Technical Assistance Activities

21. Consulting companies for all TA activities have been selected. All TA projects are proceeding in accordance with the agreed implementation plans. The standard of HFC227 has been drafted and circulated for technical review. The other 6 TA projects on standards revision and test method as well as related rules on halon 1211 and CO₂ extinguishers have been carried out smoothly. For the halon management plan, one additional provincial demonstration center for halon management activities has been started. The project has been undertaken by the Beijing Fire Fighting Bureau. As part of the Beijing halon management demonstration project, several related policies on halon phaseout have been promulgated and a survey on halon in the Beijing area has been carried out. Details on the status for TA activities are in Annex III.

Status of 2000 Annual Program

22. **Phaseout targets and objectives.** The phaseout target for the 2000 Annual Program is to (a) reduce halon 1211 production from the actual production level of 5,965 MT to a maximum of 3,980 MT and limit consumption to a maximum of 3,580 MT, and (b) to maintain halon 1301 production at 618 MT and consumption remain at 300 MT. The annual plan is currently under implementation.

23. **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 has further reduced the demand for halon 1211.

Enterprise-level phaseout activities

24. **Closure of halon production facilities.** Contracts were signed with all 6 remaining halon producers through proportional reduction of quotas. The total halon 1211 quota reduction through these contracts was 1,990 MT from the 5,965 MT production level, and will thereby stay within the annual halon 1211 target in 2000. All the 6 partial closure projects are now producing halons based on their reduced quotas. Details are in Annex I.

25. **Closure & Conversion of halon fire extinguisher manufacturers.** Contracts were signed with 12 halon extinguisher and one system manufacturers selected through the bidding process with a reduction of halon 1211 consumption of 1,138 MT. In this program, 3 halon fire extinguisher manufacturers selected closure and the other 10 selected conversion. The 3 extinguisher closure projects have been completed and certified. Most of the conversion activities have also been carried out. Details are in Annex II.

Special initiatives

26. **Halon Banking.** With the rapid phaseout of Halon 1211 in the past three years, it is necessary to start to planning the construction of a Halon Bank in order to meet the demand for essential uses after the complete phaseout of Halon 1211 in 2005. To gain experience and better understanding of halon banking, China has decided to establish halon banking and recycling centers in certain provinces. Guangdong province has been chosen to set up a branch of the China National Halon Bank. A company has been chosen to operate the facility and recycle and store Halon 1211 in the province.

27. **Plant-Protein based foam.** In the Halon Phaseout Sector Plan, foam agent is one of the major substitution agents. At present China mainly produces and consumes two kinds of foam agent:

animal-protein-based agent and AFFF. Both these agents have the common disadvantages of not being environmentally benign, and being corrosive to extinguisher cylinders which impacts on the extinguishing capacity. The production of AFFF has recently been discontinued in the USA because of environmental concerns. A new plant-protein-based foam agent has been invented by the Hongsen Fire-fighting Hi-tech. Co., Ltd., and has undergone some tests. In order to guarantee the quality of the product, China considers it necessary to set up a test laboratory with adequate testing equipment in this agent's production plant. This contract was signed in early September.

28. **MIS.** The Halon Management Information System was the first one in PMO to manage implementation of the Sector Plan, and was developed using the FoxPro database software. With the development of ODS phaseout program in China, additional Management Information Systems have been developed for various ODS sectors. However, as these were developed using later generation Access database software, the Halon Management Information System has become incompatible with the newer systems. In order to provide a complete picture on ODS program to SEPA management and project teams, it became necessary to convert the MIS to Access. This has been completed.

29. **Compilation of standards.** The government has promulgated several policies and technical standards related to Halon phaseout in China. Substitute production is also under way. China therefore considers this the appropriate time to compile a book to comprehensively introduce all these activities and substitution technologies. Such a publication will guide the phaseout of Halon in future years. It is expected that the book will be published in October, 2000.

30. **National Conference.** The Halon Sector Plan has been implemented successfully in the past three years. To guarantee the complete phaseout of Halon as scheduled and to maintain the required levels of fire fighting capacity in China, SEPA and MPS plan to hold a national meeting on Halon phaseout. The purpose of the meeting is to review the past experience and look forward to future tasks, as also to promote the experiences of the provincial demonstration centers. The meeting is planned to be held in the middle of November, 2000.

Technical Assistance Activities

31. The terms of reference of all TA projects have been prepared and the short lists for bidding have been reviewed by the World Bank. All contracts are expected to be signed by the end of 2000. The TA on "design code for water-mist fire extinguishing systems" has been deferred to the 2001 Annual Program.

PART B

2001 ANNUAL PROGRAM

Objectives

32. The phaseout target for the 2001 Annual Program is (a) to reduce halon 1211 production from the level of 3,980 MT to a maximum of 3,317 MT and consumption to a maximum of 3,117 MT and, (b) to maintain halon 1301 production at 618 MT and consumption remain at 300 MT. The 2001 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.

33. China is requesting the release of the approved amount of US\$ 4.5 million for the 2001 Annual Program as agreed in the overall Halon Sector Phaseout Plan. To achieve these goals, the following activities are envisioned:

- a) US\$1.6 million to be used for buying back quotas and as a result closing 2-3 halon agent producers;
- b) US\$2.1 million to be used for closing and converting 8-10 fire extinguisher manufacturers;
- c) US\$0.4 million to be used for converting 2-3 fire extinguishing system manufacturers; and
- d) US\$0.4 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

34. *Policies to be continued.* In 2001, 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, 1999 and 2000 Annual Programs. Preparatory work will be finished in the second half of 2000. 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, 1999 and 2000.
- 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.

35. 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:

- a) SEPA/MPS will disseminate details of the ban to all prospective consumers through various channels (news media, bulletin, propaganda, etc.);
- b) 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.
- c) 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.
- d) Strictly control the sales of halon by implementing the project of two demonstration centers and spreading the experience to other provinces in order to reach phaseout goals.

Enterprise-level activities

36. 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 2000. Closure projects (for halon agent producers) are expected to take effect from January 1, 2001 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 2001 and implementation will start afterwards. Implementation may take one year.

Technical assistance (TA) activities

37. 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 2001 include:

38. ***Design Code for Water Mist Fire Extinguishing Systems:*** As an alternative technology for halon fire extinguishing systems, water mist systems provide a good performance and cost effective alternative to halon systems. Water mist systems have been gaining acceptance in many industrial and commercial fire protection applications in other countries. 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.

39. ***Revision of Design Code for Installation of Fire Extinguishers in Buildings:*** The existing "Design Code for Installation of Fire Extinguishers in Buildings" was issued on September 1, 1991. It was used as a guideline for checking and reviewing the location of fire extinguishers in building, it specified the appropriate type of extinguishers and fire fighting capacity. It was carried out and implemented widely and usefully by local fire monitor departments and construction design institutes. With the implementation of halon sector approach in China, a lot of areas defined in the code in which halon extinguishers are available have to be redefined and restrained. Therefore, it is necessary to revise the Design Code to reflect the current situation.

40. ***Feasibility Study on Substitutes for Halon Fixed Fire Extinguishing Systems:*** With halon phasing out in China, some substitutes for halon fire extinguishing system have been developed and applied in China. In the Meantime, a lot of new halon alternative systems developed by international fire companies are introduced into China in recent years. However, it is rather difficult for fire-fighting departments, designing institutes and customs to evaluate and select suitable fire extinguishing system for different kind of uses and applications . In order to guide the application and monitor the application, a study to evaluate the quality and performance of these systems is necessary and will support the implementation of the halon sector approach.

41. ***Studies of Market Prospect for Closure Enterprises:*** With the implementation of the Halon sector approach, more and more enterprises have been closed down. For enterprises whose sole activity was the production of Halon, it is very important that they study the market and convert their production activities to other products. As the capacity of small enterprises in such aspects is rather limited, it is necessary to provide assistance from consultant firms to help in their investigation and market evaluation.

42. ***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. In addition, as the halon sector approach requires

financial and performance audits it is necessary to provide training for 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.

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

Table II. 2001 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	3,980	663	3,317	1. Closures of halon agent producers 2. TA activities to help phaseout	1. Jan-Dec. 2001
o.w. export	400		200		
Consumption	3,580	463	3,117	1. Closures of extinguishers manufacturers 2. Conversion of halon fire extinguishers to non-halon extinguishers 3. Policies and awareness to limit demand for halons	1. Jan.-Dec. 2001 2. 1 quarter of 2001 to start conversion
Halon 1301 Production	618	0	618	1. Activities to help phaseout.	1. Jan. – Dec.
Consumption	300	0	300	1.Appropriate TA to help future phaseout. 2. Policies and TA activities to direct users toward substitute fire extinguishing systems	1. Jan. – Dec.
Continuation of policy instruments					
Policy Instruments	Actions Required			Key Dates	
1. Bidding system	1. Training for the 2001 bidding 2. Bidding started 3. Bidding completed 4. Bid winners awarded for 2001 5. Contracts signing with winners 6. Implement closure/ conversion contracts.			1. Sept./Oct. 2000 2. Oct. 2000 3. Dec.2000 4. Dec. 2000 5. Dec. 2000 6. Closure -- Jan. To Dec. 2001 Conversion—starting Jan. for 12 month period	
2. Tradable production quota for halon producers	1. Establish 2001 halon production quota ; 2. Issue 2001 production quota to halon producers for 2001			1. Dec. 2000 2. Dec. 2000	
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 2001 2. Through 2001	

Table II: 2001 Annual Program (Contd.)

Enterprise-level Activities						
	Funding Requested (US\$ mill)	Existing Enterprises	# of enterprise targeted	# of enterprises at end of 1999	Key Actions Required	Key Dates
1. Closure of halon agent producers	1.6	6	2-3	3-4	Selection through bidding process or administrative action	1. Bid winners announced in Dec. 2000 2. Contracts signed Dec. 2000 3. Completed within 12 months
2. Closure & conversion of halon extinguisher manufacturer	2.1	35	7-10	25-28	Selection through bidding process	1. Bid winners announced Dec. 2000. 2. Contracts signed no later than May 2001 3. Completed within 12 months after signing contracts
3. Conversion of halon fire extinguishing system manufacturers	0.4	18	2-3	15-16	Selection through bidding process	1. Bid winners and contracts signed no later than May 2001 2. Completed within 12 months after signing contracts
Subtotal	4.1					
TECHNICAL ASSISTANCE ACTIVITIES						
Activities	MLF funding requested (US\$'000)				Actions Required	Key Dates
1. Formulating Design Code for Mist Water Fire Extinguishing System"	55				Selection of qualified institutions to formulate the code	1. Contract signed no later than 2Q 2001. 2. Finish work within 12-24 months after signing contracts.
2. Revision of Design Code for Installation of Fire Extinguishers for Buildings	25				Selection of qualified institutions to formulate design code	1. Contract signed no later than 2Q 2001. 2. Finish work within 12-24 months after signing contracts.
3. Feasibility Study on Substitutes for Halon Fixed Fire Extinguishing Systems	90				Selection of qualified institutions to carry out the study	1. Contract signed no later than 2Q 2001. 2. Finish work within 12-24 months after signing contracts.
4. Studies of Market Prospect for Closure Enterprises	60					
5. Training	60					Training will be carried out through the 2001.
6. Audit	70					
7. International consultants	40				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 2001.	
Subtotal	400					
TOTAL for phaseout activities			4,500			

Table III: 2001 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	3,980	663	3,317	• Production levels (national aggregate halon 1211 production)
o.w. exports	400		200	
Consumption	3,580	463	3,117	• Consumption levels (national halon production plus import minus export)
Halon 1301 Production phase- Out target	618	0	618	• Production levels (national aggregate halon 1301 production)
Consumption Phaseout target	300	0	300	• Consumption levels (production plus imports minus exports)
Continuation of Policy Instruments				
Initiatives	Performance Indicators			
Bidding system	<ul style="list-style-type: none"> • bidding for 2001 annual plan • Winning enterprises for 2001 selected • Enterprises trained for bid preparation for 2001 bidding 			
Tradable production quota for halon producers	<ul style="list-style-type: none"> • Annual production quota to halon producers for 2001 issued • Production reports from enterprises received 			
The ban on halon extinguisher uses in non-essential areas	<ul style="list-style-type: none"> • 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\$ mil.)	Existing Enterprises	# of enterprises at end of 2001	Performance Indicators
Closure of halon agent producers	1.6	6	3-4	<ul style="list-style-type: none"> • Number of ODS reduction contracts signed for closure • Number of closures completed
Closure & conversion of halon extinguisher manufacturer	2.1	35	28-32	<ul style="list-style-type: none"> • 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	18	16-17	<ul style="list-style-type: none"> • Number of ODS reduction contracts signed for conversion • Number of conversions completed and/or implementation progress
Subtotal	4.1			• Total disbursement to enterprises

Table III: 2001 Annual Program - Proposed Performance Indicators (contd.)

Technical assistance activities		
Activities	Amount in US\$'000	Performance Indicators
1) Formulating Design Code for Mist Water Fire Extinguishing System”	55	Date of invitation sent
2) Revision of Design Code for Installation of Fire Extinguishers for Buildings	25	Date of bidding Date of bid awards
3) Feasibility Study on Substitutes for Halon Fixed Fire Extinguishing Systems	90	Starting date of Contract Implementation schedule
4) Studies of Market Prospect for Closure Enterprises	60	
5) Training	60	Training dates Training participants
6) Audit	70	
7) International consultants	40	Date of invitation sent Date of contracts Contracts dates and amounts Date of completion of works
Subtotal	400	
TOTAL for Phaseout Activities	\$4.5million	

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 Govt.):	2,038			

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

Name of the plant	Halon phaseout (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 Fujian 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 closed	Plant closure
2. Shandong Haihua Group Shouguang Fire-fighting Chemical Plant	500	January 1, 1999	Project completed Reactor pipes dismantled	Partial closure.
3. Wuxian Chemical Plant	388	January 1, 1999	Project completed Reactor pipes dismantled	Partial closure.
4. Zhejiang Dongyang Chemical Plant	654	January 1, 1999	Project completed Reactor pipes dismantled	Partial closure.
Total (Quotas sold back to Govt.):	1,942			

III. 2000 Annual Program

Name of the plant	Halon phaseout (MT)	Closure date	Implementation status	Remarks
1. Zhejiang Dongyang Chemical Plant	779	January 1, 2000	Producing basing on reduced quota	Partial closure.
2. Shandong Haihua Group Shouguang Fire-fighting Chemical Plant	451	January 1, 2000	Producing basing on reduced quota	Partial closure.
3. Wuxian Chemical Plant	170	January 1, 2000	Producing basing on reduced quota	Partial closure.
4. Zhejiang fire-fighting Chemical Plant	130	January 1, 2000	Producing basing on reduced quota	Partial closure.
5. Foshan electro-chem general plant	381	January 1, 2000	Producing basing on reduced quota	Partial closure.
6. Zhejiang chemical research institute	79	January 1, 2000	Producing basing on reduced quota	Partial closure.
Total (Quotas sold back to Govt.):	1,990			

ANNEX II

List of beneficiary fire extinguisher and system manufacturers

I. 1998 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Completion date	Remarks
1.Zhejiang Xiangshan No.1 Fire-fighting Equipment Plant	1998.03.14	223.0	Complete/ equipment dismantled.	1999.12.22	Plant closure
2.Zhejiang Yiwu Fire-fighting Extinguisher Plant	1998.03.14	162.2	Complete/ equipment dismantled.	1999.06.23	Plant closure
3.Changzhou Fire-fighting Equipment Plant	1998.03.14	47.5	Complete/PCR finalized	1999.12.27	Conversion
4.Dalian Jinzhou Fire-fighting Equipment Plant	1998.03.14	105.7	Complete/PCR finalized	2000.01.05	Conversion
5.Guangxi Wuzhou Fire-fighting Equipment Plant	1998.03.14	52.4	Complete/PCR finalized	2000.01.06	Conversion
6.Guangzhou Zhujiang Fire-fighting Equipment Plant	1998.03.14	138.4	Complete/PCR finalized	2000.01.05	Conversion
7.Jiangxi No.1 Fire-fighting Equipment Plant	1998.03.14	220.8	Complete/PCR finalized	2000.01.08	Conversion
8.Nanjing Heli Fire-fighting Equipment Plant	1998.03.14	146.4	Complete/PCR finalized	1999.12.27	Conversion
9.Ningxia Yongning Fire-fighting Equipment Plant	1998.03.14	23.0	Complete/PCR finalized	2000.01.09	Conversion
10.Panyu Shengjie Fire-fighting Equipment Plant	1998.03.14	435.1	Complete/PCR finalized	2000.01.04	Conversion
11.Shanghai Haishen Fire-fighting Equipment Plant	1998.03.14	149.6	Complete/PCR finalized	1999.12.23	Conversion
12.Shanghai Punan Fire-fighting Equipment Plant	1998.03.14	268.4	Complete/PCR finalized	1999.12.24	Conversion
13.Shanghai Qingpu Fire-fighting Equipment Plant	1998.03.14	169.9	Complete/PCR finalized	1999.12.25	Conversion
14.Shenyang Fire-fighting Equipment Plant	1998.03.14	153.7	Complete/PCR finalized	2000.01.06	Conversion
15.Xiangshan Fire-fighting Equipment Plant	1998.03.14	270.6	Complete/PCR finalized	1999.12.21	Conversion
16.Ningbo Sanyou Fire-fighting Equipment Ltd.	1998.03.14	50.0	Complete/PCR finalized	2000.03.14	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/ Actual Completion date	Remarks
1.Zhejiang Dongyang Fire-fighting Equipment Plant	1999.03.16	131.88	Complete/ equipment dismantled.	1999.12.24	Plant closure
2.Shanghai Global Fire-fighting Extinguisher Plant	1999.03.16	32.66	Complete/ equipment dismantled.	1999.12.22	Plant closure
3.Helongjiang Fire-fighting Equipment Plant	1999.03.16	23.4	Most of conversion activities have been done.	2001.03.16	Conversion
4.Guangzhou Fire-fighting Equipment Plant	1999.03.16	83.431	Most of conversion activities have been done.	2001.03.16	Conversion
5.Jiangsu Taixin Fire-fighting Equipment Plant	1999.03.16	336.6	Most of conversion activities have been done.	2001.03.16	Conversion
6.Chongqing Zhendan Fire-fighting Equipment Plant	1999.03.16	60.77	Most of conversion activities have been done.	2001.03.16	Conversion
7.Heilongjiang Shangzhi Fire-fighting Equipment Plant	1999.03.16	78.4	Most of conversion activities have been done.	2001.03.16	Conversion
8.Hubei Jiangling Fire-fighting Equipment Plant	1999.03.16	194.78	Most of conversion activities have been done.	2001.03.16	Conversion
9.Shandong Weifang Fire-fighting Equipment Plant	1999.03.16	153.116	Most of conversion activities have been done.	2001.03.16	Conversion
10.Shunde Fire-fighting Equipment Plant	1999.03.16	192.72	Most of conversion activities have been done.	2001.03.16	Conversion
11.Guangzhou Fire-fighting Equipment Plant	1999.03.16	29.697	Most of conversion activities have been done.	2001.03.16	System Conversion
Total (Average halon 1211 consumption 1995 to1997):		1,317.431			

Note: From the experience of the 1998 annual program, SEPA had decided that all contracts for fire extinguishers and systems had to be completed within two years from the date of signing.

III. 2000 Annual Program

Name of the manufacturer	Project starting date	Phaseout amount (MT)	Implementation Status	Planned completion date	Remarks
1.Guangzhou Baiyun Luoyang Fire-fighting Equipment Plant	2000.02.24	183.608	Project complete/ equipment dismantled.	2001.02.24	Plant closure
2.Zhejiang Linhai Fire-fighting Equipment Plant	2000.02.24	57.5	Project complete/ equipment dismantled.	2001.02.24	Plant closure
3.Anhui Bengbu Fire-fighting Equipment Plant	2000.02.24	142.124	Project complete/ equipment dismantled.	2001.02.24	Plant closure
4.Suzhou Fire-fighting Equipment Plant	2000.02.24	14.2677	Conversion activities in processing	2001.02.24	Conversion
5.Shanghai No. 4 Fire-fighting Equipment Plant	2000.02.24	74.762	Conversion activities in processing	2001.02.24	Conversion
6.Lianyungang Tianyi Fire-fighting Equipment Plant	2000.02.24	52.35	Conversion activities in processing	2001.02.24	Conversion
7.Tianjin Tanggu Fire-fighting Equipment Plant	2000.02.24	45.64	Conversion activities in processing	2001.02.24	Conversion
8.Zhejiang Wananda Fire-fighting Equipment Plant	2000.02.24	56.5	Conversion activities in processing	2001.02.24	Conversion
9.Zhenzhou Huanghe Fire-fighting Equipment Plant	2000.02.24	25.153	Conversion activities in processing	2001.02.24	Conversion
10.Nanjing Honghu Fire-fighting Equipment Plant	2000.02.24	81.818	Conversion activities in processing	2001.02.24	Conversion
11.Zhuhai Zhuzhou Fire-fighting Equipment Plant	2000.02.24	80	Conversion activities in processing	2001.02.24	Conversion
12.Fujian Changle Fire-fighting Equipment Plant	2000.02.24	284.2	Conversion activities in processing	2001.02.24	Conversion
13. Zhuhai Zhuzhou Fire-fighting Equipment Plant	2000.02.24	40.5	Conversion activities in processing	2001.02.24	System Conversion
Total (Average halon 1211 consumption 1995 to1997):		1138.423			

Note: In early 2000, MPS issued a regulation that all enterprises which won the bidding would have to complete conversion projects within a year. This include the fire extinguisher and systems manufacturers.

A. Implementation of Technical Assistance Activities in the 1998 Annual Program

Name of TA Projects	Implementing Agency	Contract Date	Implementation Status	Planned/actual Completion Date	Remarks
1.Revision of Standards for ABC Powder	Tianjin Fire Research Institute	1998.04.28	Completed, not yet commissioned	1999.12.31	
2.Design Codes for Gaseous Fire Extinguishing Systems	Tianjin Fire Research Institute	1998.04.28	Completed draft code, delayed because of not getting confirmation from National Standard Bureau	2000.01.31	
3.Standards for Components of Gaseous Fire Extinguishing Systems	Tianjin Fire Research Institute	1998.04.28	Completed , not yet commissioned.	2000.02.28	
4.Halon Management Plan-Overall Management	Shanghai Fire Research Institute	1998.04.28	Completed, not yet commissioned	1999.12.31	
5.Halon Management Plan-Training Courses and Propaganda Materials	Shanghai Fire Research Institute	1998.04.28	Completed, not yet commissioned	2000.06.30	
6.a)Halon Management Plan-Provincial Promotions and Demonstration Centers	Shanghai Fire Fighting Bureau	1998.04.28	Completed, not yet commissioned	1999.10.31	
6.b)Halon Management Plan-Provincial Promotions and Demonstration Centers	Guangdong Fire Fighting Bureau	1998.04.28	Completed and Commissioned	1999.08.31	
7.Development of halon Management Database and Data collection System	Qinghua University	1998.04.28	Completed, not yet commissioned	1998.09.28	
8.Management Information System	Qinghua University	1998.04.28	Completed, not yet commissioned	1998.04.02	
9.Training	SEPA		four training workshops have been conducted	1998.12.10	
10. Export/Import	Beijing University	1998.08	Completed, not yet commissioned	1999.11.30	

B. Implementation of Technical Assistance Activities and Special Initiatives, 1999 Annual Program

Name of TA Projects	Implementing Agency	Contract Date	Implementation Status	Planned Completion Date	Remarks
TA					
1. Halon management plan--establishment of demonstration centers	Beijing Fire Fighting Bureau	1999.11.10	1)The demonstration center has been established and are now in operation; 2)A series of local policies have been formulated and issued. 3)Halon consumption survey has been carried out. 4)Propaganda has been launched on newspaper, magazines and TV.	2001.7.10	
2. Demonstration halon bank	Guangdong Fire Fighting Bureau	1999.11.10	1) International Information on halon bank policies have been collected and reviewed; 2) The framework of Guangdong demonstrative halon bank has been formulated. 3) Recycle and reclaim procedure has been studying and testing.	2001.7.10	
3. Revision of national standard for CO ₂ fire extinguishing agent	Tianjin Fire Research Institute	1999.11.10	1)Test equipment has been installed; 2)Information on similar international standards collected & reviewed.	2001.7.10	
4. Study on test method and test equipment for CO ₂ fire extinguishing agent	Tianjin Fire Research Institute	1999.11.10	1)Test equipment has been installed; 2)Information on similar international standards collected & reviewed.	2001.7.10	
5. Revision of the design code of CO ₂ fire extinguishing systems	Tianjin Fire Research Institute	1999.11.10	1)Test equipment has been installed; 2)Information on similar international standards collected & reviewed.	2001.7.10	
6. Study on the scope of use of CO ₂ extinguishers	Shanghai Fire Research Institute	1999.11.10	1)Information on similar international standards collected & reviewed. 2)The study and test procedure has been set up.	2001.7.10	
7. Study on the standard and test method of CO ₂ extinguishers with light cylinders	Shanghai Fire Research Institute	1999.11.10	1)Test equipment has been installed; 2)Information on similar international standards collected & reviewed.	2001.7.10	
8. Formulation of national standard for HFC227 agent	Tianjin Fire Research Institute	1999.11.10	1)Completed 1 st draft standard for review by the fire protection industry	2001.7.10	

9. Study on the disposal standard for Halon 1211 extinguishers	Shanghai Fire Research Institute	1999.11.10	1) Completed the collection of test samples; 2) Formulated the test plan and procedure; 3) Launched sample test.	2001.7.10	
10. Training	SEPA		four training workshops have been conducted		
Special Initiatives					
1. ABC Dry Powder Production Line	Foshan Electro-Chem General Plant	1999.05.12	All equipment has arrived in plant. The production line is being commissioned.	2001.05.12	
2. Light Weight CO2 Cylinders	Weifang Dongming Fire-fighting Equipment Co., Ltd.		Feasibility study carried out and expected to be completed in the second half of year 2000	Three years after contract signed	

C. Implementation of Technical Assistance Activities and Special Initiatives, 2000 Annual Program

Name of TA Projects	Implementing Agencies	Contract Date	Implementation Status	Planned Completion Date	Remarks
1.Design code for Water Mist Fire extinguishing System					Defer to 2001 annual program
2. National standards for performance requirements and test methods of Components of Water Mist fire extinguishing systems				18 months after the contract signed	
3. Propaganda for halon sector approach and halon alternative technology				18 months after the contract signed	
4. Design Code for Dry Powder Fire Extinguishing System				18 months after the contract signed	
5. National standards for inert gas agents				18 months after the contract signed	
6. Review and Revise Chinese Halon Essential Uses Criteria and List				18 months after the contract signed	
7. Study on test equipment for portable light weight CO ₂ Cylinders				18 months after the contract signed	
8. Revision of national standards for portable Mechanical foam extinguishers				18 months after the contract signed	
9. Revision of national standards for portable dry powder extinguishers				18 months after the contract signed	
10 Study on the use of bulk nitrogen supply for the pressurization of fire extinguishers					Deferred.
11. Training of personnel involved in phaseout activities.	SEPA		Two training workshops were conducted in March, 2000.	December, 2000	
12. Performance audit training	China National Audit Office		Training workshop for provincial auditors conducted in April, 2000.	Completed June , 2000.	
Special Initiatives:					
Halon MIS Update	Qinghua University		The update of Halon MIS has finished.	Three months after contract signed.	
National Halon Phaseout Conference	SEPA		Conference is in preparation	2000.11.30	
Book on China Halon Phaseout Action	SEPA		First draft of the book has been finished	2000.09.30	
Plant Protein Foam p-roject	Hongsen Fire-fighting Hi-tech Co.Ltd.		Contract was signed in early September.	2001.09.31	

Halon Bank Guangdong Branch	Guangdong Fire Fighting Bureau		Company selected to run facility.		
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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	0	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	1,990	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	450	450	450	450	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	150	0	0	0	450	0	0	0	150	
Consumption phaseout target		0	0	0	0	150	0	0	0	50	0	0	0	100	
Required funding from MLF (\$'000)		1240	970	1060	450	370	590	120	180	1140	40	30	10		6200

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THE CFC PRODUCTION SECTOR OF CHINA 2001 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 2001 annual programme for the implementation of the Agreement, with the understanding that funding for the 2001 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 2000 programme as of August 2000.

(i) Implementation of the 1999 annual programme has reduced the CFC production from 50,351 tonnes/ODP to 44,853 tonnes/ODP in compliance with the Agreement approved in March 1999. This was partially accomplished by closing 21 plants whose closures was verified in 1999. Therefore, the total number of CFC plants were reduced from 37 to 16 in 1999. Implementation of the 2000 annual programme would further reduce the CFC production from 44,853 tonnes/ODP to 40,000 tonnes/ODP according to the target set in the sector plan. This would be achieved by closing additional 6 plants, leaving 10 plants still producing by the end of 2000. The first six months of CFC production was reported at 20,978 tonnes/ODP, which was achieved through implementation of tradable production quotas. The report provided a list of plants with names, CFC product, capacity and the 2000 production quota both of the plants that would be shut down and the plants that would be producing. The result of implementing this component of the 2000 programme would be verified by the World Bank and reported to the first meeting of the Executive Committee in 2001.

(ii) The progress report on the 2000 annual programme also includes a list of policy controls that have been enacted by the Government of China which includes “Circular on Control Mechanism of Import and Export of ODS” promulgated in December 1999 and “Export/Import Control List of ODS in China” under which carbon tetrachloride is banned and CFCs are regulated by license.

- (iii) There is an update on the implementation of the biennial technical assistance programme (1999-2000) which includes training of custom officers, personnel to conduct performance audit, feasibility study for a HFC-134a production facility, survey on the ODS applications as chemical process agents in China and other activities.
 - (b) Part II of the World Bank's submission is a description of the components of the 2001 programme, which includes policy actions, production reduction quota, and technical assistance activities. The key component, the production reduction quota would require a reduction of 3,800 tonnes/ODP in 2001 to meet the Agreement target that the national CFC production should be no more than 36,200 tonnes/ODP in 2001. China will continue to implement the tradable production quota combined with the bidding, as well as the implementation of the export/import control mechanism which has been enacted.
3. The submission of the World Bank includes a list of 19 HCFC producers in China as per the Agreement.
4. The World Bank's submission requested disbursement of US \$13 million for implementation of the year 2001 programme and the support cost.

COMMENTS FROM THE SECRETARIAT

Unverified plant closures

1. The plants reported as closed by the World Bank in 1999 includes two plants (Liaoning Chemical Group Chlor-Alkali Plant and the Fujian Shaowu Fluorochemical Plant) which have not been verified. The two verification reports that were submitted by the World Bank to date covered plant closures verified up till January 2000 but not the verification of these two plants which was scheduled for "March 5-8, 2000" in the submission.

Information concerning the implementation of the tradable quota system in China

2. China has been using a tradable quota system to implement the CFC production reductions and it has also been observed from the submission that at the national level the total production of CFC-11 and CFC-12 exceeds the national quota in each case. At the plant level there is also variance between the quota allocated to them and the actual production. However it would be useful to elaborate how the system operates, including such parameters, among other things, like the institution that is administrating the trading and the agency that is supervising its implementation.

RECOMMENDATIONS

1. The World Bank should include the two plants, Liaoning Chemical Group Chlor-Alkali Plant and the Fujian Shaowu Fluorochemical Plant in the verification report to be submitted to the first meeting in 2001.
2. The tradable quota system is the vehicle by which the Government of China is using to implement its CFC reductions. It is important to understand how it is being managed to provide confidence in its effectiveness. Therefore China should provide to the Secretariat information on the operation of the tradable quota system, including such parameters like the institution that is administering the trading, the agency that is supervising its implementation and other detail.

THE CFC PRODUCTION SECTOR
CHINA

2001 ANNUAL PROGRAM

SEPTEMBER 12, 2000

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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 **third tranche** of **US\$13 million** for the implementation of the 2001 Annual Program. With this funding, China's CFC production will be reduced to a **maximum of 36,200 MT** by the end of 2001, and China will need to phase out an additional 3,798 MT in ODP terms during the year compared to the 2000 quota. Details of the 2001 annual program are provided in Section B.
2. Following the approval of the China CFC Production Sector Plan at the 27th Meeting of the ExCom in March 1999 and the release of funds for the first (1999) Annual Program, China has implemented the phaseout project according to the agreed phaseout plan. Since the start of the program, China has developed supporting policies and regulations. At the beginning of the program, there were 37 CFC production plants in China; the number has been reduced to 10 producers in 2000, CFC production has been reduced from 50,351 MT in 1997 to 44,768 MT in 1999 in terms of ODP, which is lower than the annual requirement, and will not exceed 39,998 MT in 2000.
3. Fourteen technical assistance activities have been started, including activities to strengthen the implementation capacity and conversion capacity of closure enterprises, and preparation of standards to ensure quality and reliability of CFC substitutes.
4. The detailed implementation status of the 1999 and 2000 Annual Programs is described in Section A.
5. **China's 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

Year	Agreed schedule ^{1/}		Planned		Actual Production ^{3/}	Annual grant funding
	Phaseout Amount in the year	Maximum production in the year	Phaseout Amount in the year	Maximum planned production ^{2/}		
	<i>(Metric Tons, ODP)</i>					<i>(US\$ million)</i>
1999	5,420	44,931	5,498	44,853	44,768	20
2000	4,931	40,000	4,855	39,998		13
2001	3,800	36,200				13
2002	3,300	32,900				13
2003	2,900	30,000				13
2004	4,700	25,300				13
2005	6,550	18,750				13
2006	5,250	13,500				13
2007	3,900	9,600				13
2008	2,200	7,400				13
2009	4,200	3,200				13
2010	3,200	0				0 ^{4/}
						150

Note: The baseline year for CFC production phaseout is 1997. Baseline year production of CFCs (comprising CFC-11, CFC-12, CFC-113, CFC-114, CFC-115, CFC-13) was 50,351 MT (ODP).

- 1/ As provided in the agreement.
- 2/ The sum of quotas issued in the year to the enterprises remaining in production.
- 3/ Actual total production by the remaining enterprises.
- 4/ Savings from earlier years would be used for funding the 2010 phaseout.

PART A**IMPLEMENTATION STATUS OF PREVIOUS YEARS' ANNUAL PROGRAMS****As of August, 2000****Phaseout Target**

6. Starting with a baseline production of 50,351 MT in 1997, the phaseout target for 1999 was to reduce CFC production to **44,931 MT**, measured in ODP; following the completion of the bidding process, quotas for only **44,853 MT** were issued to the remaining CFC plants. Actual audited production for 1999, according to an audit carried out by the China National Audit office in June 1999, was verified as **44,768 MT** (See Table A.2). The phaseout target for 2000 was to further reduce CFC production to **40,000 ODP MT**. Following the completion of the bidding process, quotas were only issued for **39,998 MT** to the remaining 10 CFC plants. Actual targeted production phaseout for the year 2000 was therefore **4,855 MT** compared to 1999 quota.

Enterprise Phaseout Activities

7. Details regarding the enterprise phaseout activities in the 1999 and 2000 Annual Programs are provided in Table A1. The impact of closures is summarized as follows:

Date of contracts	No. of lines closed	Enterprises closed	Capacity closed (MT)	Enterprises remaining
No. of enterprises at start of program (36 in Sector Plan, 1 identified later):				37
Plant closures in the 1999 Annual Program				
1. April & May 1999	17	14 (all complete closures)	22,630	23
2. April & May 1999	3	1 (2 enterprises closed one line each, and the 3 rd enterprise was completely closed)	4,000	22
		Total	26,630	
3. June 99	8	7 (all complete closures)	23,800	15
Closures under 2000 Annual Program				
December 1999 to March 2000	5	5 (complete closures); a sixth enterprise has accepted a reduction of quota.	15,500	10

8. Three sets of closures were carried out under the 1999 Annual Program.

- a) Under the production sector agreement, China committed to close and dismantle production facilities at 14 enterprises that had not been in production in 1997 (one of these lines did, however, produce some CFCs in the early part of 1999, prior to the agreement). Between April 22 and May 12, SEPA signed closure contracts with these 14 enterprises listed in the approval conditions for the CFC Production Sector Phaseout Plan. The reduction of production capacity resulting from the closure of these 14 enterprises totaled 22,630 MT (Table A1, Part 1).

- b) Contracts were also signed with 3 other enterprises for closing down production lines that had no production in 1997. The reduction of production capacity resulting from the closures of these three lines totaled 4,000 MT (Table A1, Part 2). The total production capacity dismantled through these permanent closures was 26,630 MT. In accordance with the Agreement for the CFC Production Sector, all production lines and plant facilities had been dismantled and their primary CFC production equipment destroyed by the end of June 1999.
- c) As a result of the quota regulation and bidding for 1999 quotas (see below), contracts were signed in June 1999 with 7 enterprises to phase out production capacity of 23,800 MT (Table A1, Part 3). All the enterprises have completed dismantling of their facilities; the production lines at each location have been verified by a World Bank team that visited the sites and confirmed that these facilities are no longer capable of producing CFCs and their primary production equipment has been fully dismantled.

9. Under the 2000 Annual Program, as a result of the quota regulation and bidding, contracts were signed in December 1999 with 6 enterprises, of which 5 enterprises were to close and dismantle production facilities and one enterprise was to accept a reduction in quota, so as to enable a phase out of production capacity totaling 15,550 MT in 2000 (Table A1, Part 4). By the end of March, 2000, all the closing production lines and plant facilities had been dismantled and their primary CFC production equipment had been destroyed in accordance with the Agreement for the CFC Production Sector. These production lines were visited by a World Bank team in early September, 2000 to confirm that they are no longer capable of producing CFCs and their primary production equipment has been fully dismantled. The enterprise accepting a reduction in quota will be verified in 2001.

10. CFC production for 1999 was audited by the China National Audit office, and has been verified at 44,768.12 MT in ODP terms; details are at Table A.2. In year 2000, production recorded up to June 30, 2000 totalled 20,978 MT of ODP. Details are provided in Table A.3.

Implementation of Policy Instruments

11. *Key instrument.* The key policy instrument of the program is the regulation promulgated for the introduction and implementation of an annual tradable quota system, entitled "Circular on Implementing the Quota System for CFC Production", by the State Environmental Protection Administration (SEPA) and the State Administration of Petroleum and Chemical Industry (SAPCI) on May 31, 1999. A bidding system was also introduced together with the promulgation of the tradable production quota. Under this regulation, seven CFC producers were awarded grants through bidding in 1999 to reduce production of 5,498 ODP MT, and a national CFC production quota of 44,853 MT was issued to the 15 remaining CFC producers in order to ensure that the national production for the year did not exceed the agreed target. Similarly, for 2000, five CFC producers were awarded grants to stop production, and one CFC producer accepted a reduction in production quota, for a total phaseout of 4,855 ODP MT; overall, a national CFC production quota of 39,998 MT was issued in February to the 10 remaining CFC producers in order to ensure that the national production for the year does not exceed the agreed target.

12. *Other instruments relate to trade in CFCs.* A study on options for export/import management for halons and CFCs, which would help China to monitor trade in CFCs and prevent illegal CFC trade, was completed in July 1999. A “Circular on Control Mechanism of Import and Export of ODS” was promulgated on December 3, 1999. The mechanism is implemented by Management Office of ODS Import-Export Control jointly administered by SEPA, the General Administration of Customs (GAC), and the Ministry of Foreign Trade and Economic Cooperation (MFTEC), and helps China to monitor trade in ODS and eliminate illegal ODS trade. An *Export/Import Control List of ODS in China* was promulgated in January 2000. Imports of Carbon Tetrachloride, a key feedstock for CFCs production, were banned on April 1, 2000, and imports of CFCs are regulated by a permit system administered by the MFTEC.

Technical Assistance Activities

13. Sixteen technical assistance activities have so far been identified under the first two annual programs, and fourteen have either been completed or are underway.

14. The 1999 Annual program originally had ten technical assistance activities. One TA project, *ODS export/import management and monitoring study* that was originally included in the 1999 annual program was cancelled because its objectives were covered under a similar study conducted under the Halon Sector Phaseout Program. Instead, another project, a *survey on the ODS application as chemical process agents in China*, was added to the 1999 annual program. Some activities have already been completed and the rest are being conducted. All are expected to be completed within two calendar years. Similarly, there were five technical assistance activities taken up in the original and approved 2000 Annual Program, and a new workshop for customs staff is being added. All the TA activities have started and all are expected to be completed within two calendar years.

15. The status of the 1999 technical assistance activities as of July 2000:

- a) Production of an ODS phaseout video. An ODS Phaseout video was prepared and broadcast for public information during the 11th meeting of the Parties in Beijing in November 1999. The video, as well as six TV advertisements prepared under the activity, have been 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. All activities have been completed.
- b) Development of a Management Information System (MIS). An MIS has been established and is now in place, and has been used to generate the final 1999 production data and program progress reports. Modifications will be made to the MIS continuously over the implementation of the program to reflect the changing requirements of the program.
- c) Development of a substitute strategy. TORs were agreed with the World Bank in January 2000. After a bidding process, a contract was signed in June 2000, and the study is under way. It is expected to be completed in June 2001.
- d) Formulation of Standards for Cyclopentane, HCFC 141b, and HFC 134a. A TOR was agreed with the World Bank and a contract was signed in April, 2000;

preliminary sampling of HCFC-141b and HFC-134a has been completed for testing, and preliminary content and parameters of the standards have been confirmed with the Government's administrative unit for standards. This TA is expected to be completed by the end of 2001.

- e) Evaluation of bids for a feasibility study for setting up of a HFC 134a production facility. Funding was provided to an evaluation of four proposals bidding to win the opportunity to undertake a feasibility study for the construction of a HFC 134a production facility. Bid evaluation was finalized and a winner was selected. The feasibility study and evaluation of the feasibility study are expected to be completed within 2000.
 - f) Training of personnel involved in phaseout activities. Two training workshops were conducted in 1999 for CFC producers, local Environmental Protection Bureaus and local Chemical Industry Bureaus. Moreover, an audit training workshop was conducted in April 2000. All activities under this TA have been completed.
 - g) Initial desk review of the consumption of ODS in the Chemical Process Agents Application sector in China. This review was carried out in January, 2000 and the Report of Preliminary Survey on the ODS Application as Chemical Process Agents in China has been used as the basis for preparations on the project preparation request for the Process Agent Sector Phaseout Plan in China.
 - h) Market prospects for closure enterprises. This TA activity has been completed. Nine enterprises submitted applications and eight were funded. The first disbursement was made to enterprises in February 2000, and all enterprises submitted their completion reports to the sector team by May 2000. A report of the project activities was submitted to the World Bank on June 5, 2000, reporting on the generally useful results of this experience.
 - i) National Workshop on substitute development. This workshop was conducted on June 7, 8 and 9, 2000. 35 representatives from 30 CFC enterprises attended the workshop, and 11 experts from four domestic famous research institutes and universities made presentations at the conference. The experts introduced research topics relating to nine categories of CFC substitutes, fine fluorine chemicals, electrical fluorinated chemicals, electronic pure chemical reagents, special fluorine-containing drugs and agrochemicals (herbicide, insecticide etc.); production of these chemicals, and their potential market prospects. Many enterprises expressed an interest in seeking assistance and collaboration from these institutes and universities.
 - j) Recruitment of International Technical Consultants. No technical consultants were recruited internationally for TA activities in 1999.
16. The status of the 2000 technical assistance activities as of July 2000:
- a) Formulation for standards for HFC-152a, and isobutane. Draft TORs were agreed with the World Bank in August 2000.

- b) Training of personnel involved in implementation of phaseout activities (including performance audit training). A TOR was submitted to the World Bank on April 25, 2000, and agreement was reached in early August 2000. Training activities for production quota bidding, for local Environmental Protection Bureaus, Petroleum Chemical Industrial Bureaus or relevant institution and auditors, are scheduled to be conducted in September, November and December 2000. A workshop for Customs staff will be added. Training activities will be conducted in Dec. 2000.
- c) Studies of market prospects for closure enterprises. Based on the generally successful experience of this activity in 1999, a similar TOR enabling such studies for both closure and production enterprises, has been reviewed with the World Bank and agreed in early August 2000. All activities are expected to be completed by the middle of 2001.
- d) Performance Audit. A Performance audit is required under the CFC sector plan. The China National Audit Office (CNAO) has informed SEPA that, as the content of this audit is more substantive than the conventional financial audits, additional expenditures are necessary to finance this activity annually. A TOR has been agreed between the Bank and SEPA for this purpose. The 1999 Performance Audit has been completed.
- e) Verification of HCFC-22 Producers. The list of producers of HCFC-22 in China has been provided along with the annual program. A survey will be conducted to validate the list and verify whether there have been any changes.
- f) Recruitment of international technical consultants. No technical consultants are expected to be recruited in 2000. This activity will be activated when necessary.

Plants producing HCFC-22 in China

17. As required by the agreement on the production sector, China has provided a list of the plants producing HCFC-22 in China, attached in Table A.4. The list will be verified in the second half of 2000 as indicated above.

Table A.1: Status of All CFC Producing Plants under the Production Sector

SRI No.	Name of CFC producers	CFC produced	Capacity (MT /Y)	Status/Date Dismantling verified ¹	Production Data ² (MT/ODP)	
					"Assigned" Quota	1999 production
PART 1: PRODUCTION LINES CLOSED AS PART OF APPROVAL CONDITIONS (CONTRACTS 4&5/ 1999)						
A3	Shangdong Dongyue Chemical Co. Ltd. (1 CFC-12 production line only)	CFC-12	5,000	Aug 16-20, 1999	1,042	1,042
C2	Hunan Yiyang Chlor-Alkali Chemical Co. Ltd. 1 CFC 12 production line.	CFC-12	1,000	SRI report + Aug 16-20, 1999		
C5	Inner Mongolia Baotou Chemical Plant #1. 1 CFC-12 production line.	CFC-12	700	Aug 23-27, 1999		
C1	Jiansu Jianhu Phosphate Fertilizer Plant 1 CFC-12 production line.	CFC-12	500	August 8-13, 1999		
B4	Sichuan Zigong Fujiang Chemical Plant 1 CFC-11 production line and 1 CFC-12 production line.	CFC-11 CFC-12	1,500 1,000	August 8-13, 1999		
B9	Zhejiang Linhai Jianxin Chemical Plant 1 CFC-12 production line.	CFC-12	800	SRI report + August 16, 1999		
A14	Guangdong Huiyang Chemical Plant 1 CFC-11 production line and 1 CFC-12 production line.	CFC-11 CFC-12	1,000 3,000	August 8-13, 1999		
A1	Henan Hebi Chemical Plant #1. 1 CFC-12 production line.	CFC-12	1,500	Aug 16-20, 1999		
C3	Hebei Longwei Fluorochemical Plant #1 2 CFC-12 production lines.	CFC-12	1,080	SRI report + Aug 16-20, 1999		
C4	Guizhou Wuling Chemical Plant. 1 CFC-12 production line and 1 CFC-13 production line.	CFC-12 CFC-13	1,500 50	SRI report + August 8-13, 1999	18	0
A15	Guangdong Zhaoqing Chemical Plant. 1 CFC-12 production line.	CFC-12	500	August 8-13, 1999		

¹ Exact date of verification visit to plant by the Bank team. References to the SRI report in this column indicate that, according to the technical audit report, the plant had already been dismantled.

² All numbers rounded off.

SRI No.	Name of CFC producers	CFC produced	Capacity (MT /Y)	Status/Date Dismantling verified	Production Data ³ (MT/ODP)	
					"Assigned" Quota	1999 production
	(PART 1 CONTD.)					
C6	Shanxi Shangzhou Chemical Plant1 CFC-12 production line	CFC-12	2,000	Aug 16-20, 1999		
A12	Shanghai Shuguang Chemical Plant 2 CFC-113 production lines.	CFC-113	1,000	August 8-13, 1999		
B10	Zhejiang Linhai Shuiyang Chemical Plant 1 CFC-12 production line.	CFC-12	500 MT	SRI report + August 8-13, 1999		
1	Total Production capacity dismantled through these closures	CFC-11	2,500		0	0
		CFC-12	19,080		1,060	1,042
		CFC-13	50		0	0
		<u>CFC-113</u>	<u>1,000</u>		<u>0</u>	<u>0</u>
		Total	22,630		1,060	1,042
PART 2: ADDITIONAL PRODUCTION LINES CLOSED IN 1999 (CONTRACTS 4&5/99)						
SRI No.	Name of CFC producers	CFC produced	Capacity (MT /Y)	Status/Date Dismantling verified	Production Data (MT/ODP)	
A2	Shangdong Jinan 3F Chemical Co. Ltd. 1 CFC-11 production line	CFC-11	1,500	Aug 16-20, 1999	0	0
Not audited by SRI	Liaoning Chemical Group Chlor-Alkali Plant. 1 CFC-12 production line.	CFC-12	1,000	March 5-8, 2000	0	0
B15	Fujian Shaowu Fluorochemical Plant. (one CFC-11 production line only; CFC12 line remained in production.)	CFC-11	1,500	March 5-8, 2000	0	0
	Total Production capacity dismantled through these closures	CFC-11	3,000		0	0
		<u>CFC-12</u>	<u>1,000</u>			
		Total	4,000			

³ Quotas are tradable between enterprises after allocation, and consequently may not match production levels.

Table A.1: Status of All CFC Producing Plants under the Production Sector (con't)

PART 3: PLANTS CLOSED IN 1999 AT APPROVAL IN ACCORDANCE WITH QUOTA REGULATION (CONTRACTS 6/ 99)						
SRI No.	Name of CFC producers	CFC produced	Capacity (MT /Y)	Status / Date Dismantling verified	Production Data (MT/ODP)	
					1999 ⁴ Quota	1999 production
B2	Chongqing Tianyuan Chemical Plant. CFC-11 and CFC-12 on the same production line	CFC-11 CFC-12	500 *	January 16, 2000	0	14 0
B5	Hubei Wuhan Changjiang Chemical Plant 1 CFC-11 production line, 1 CFC-12 production line	CFC-11 CFC-12	1,500 4,500	January 15, 2000	0	0 0
A5	Jiangsu Wuxian Juxing Chemical Plant 1 CFC-11 production line	CFC-11	2,000	January 14, 2000	0	0
A6	Jiangsu Wuxian Union (City Link) Chemical Plant. 1 CFC-11 production line	CFC-11	1,800	January 14, 2000	0	0
B1	Jiangxi De'an Refrigeration Plant 1 CFC-12 production line	CFC-12	3,000	January 12, 2000	0	0
A2	Shandong Jinan 3F Chemical Co. Ltd. 1 CFC-12 production line	CFC-12	3,500	August 17, 1999	0	0
B6	Shanghai Chlor-Alkali Chemical Plant Co. Ltd. 1 CFC-12 production line	CFC-12	7,000	January 13, 2000	687	687
	Total Production capacity dismantled through these closures, production 'quota' (derived from baseline) and actual production	CFC-11 CFC-12 Total	5,800 <u>18,000</u> 23,800		0 <u>687</u> 687	14 <u>687</u> 701

⁴: Quotas are tradable between enterprises after allocation, and consequently may not match production levels.

Table A.1: Status of All CFC Producing Plants under the Production Sector (con't)

PART 4. PERMANENT PLANT CLOSURES AND QUOTA REDUCTIONS AFTER 2000 ANNUAL QUOTA BIDS (CONTRACTS 12/99)						
SRI No.	Name of CFC producers	CFC produced	Capacity (MT /Y)	Status/Date Dismantling verified	Production Data (MT/ODP)	
					1999 Quota ⁴	1999 production
A9	Jiangsu Wuxi Hushan Refrigeration Plant 1 CFC-11 production line	CFC-11	4,000	For 9/2000	1,003	560
B3	Sichuan Zigong Refrigerant Plant 1 CFC-11 production line, 1 CFC-12 production line	CFC-11 CFC-12	1,500 1,500	For 9/2000	409 54	198
B13	Zhejiang Lanxi Refrigeration Plant 1 CFC-11 production line	CFC-11	2,500	For 9/2000	1,670	785
B7	Zhejiang Rui'an Haitian Chem. Co. Ltd. 1 CFC-11 production line	CFC-11	5,000	For 9/2000	1,122	617
A4	Shandong Xuecheng Xinxing Chemical Plant 1 CFC-12 production line	CFC-12	1,000	For 9/2000	110	0
A10	Jiangsu Changshu Ref. Plant (Changshu 3F) reduction – quota reduced by 50 MT	CFC-113	50 (quota reduction only)	For 9/2000	See Part 5	
	Total impact on national capacity, production quota, and actual production	CFC-11 CFC-12 <u>CFC113</u> Total	13,000 2,500 <u>50</u> 15,550		4,204 164 <u>0</u> 4,368	2,160 0 <u>0</u> 2,160

⁴: Quotas are tradable between enterprises after allocation, and consequently may not match production levels.

Table A.1: Status of All CFC Producing Plants under the Production Sector (contd.)

PART 5. PLANTS REMAINING IN 2000						
SRI No.	Name of CFC producers	CFC produced	Capacity (MT /Y)		Production Data (MT/ODP)	
					1999 Quota⁴	1999 production
A8	Jiangsu Meilan Electric Chem. Plant 1 CFC-11 line and 1 CFC-12 line	CFC-11 CFC-12	3000 3000		1,337 1,866	1765 1866
B14	Zhejiang Juhua Florochem. Com. Ltd. Produce CFC-11 and CFC-12 in 1 production line	CFC-11 CFC-12	4000 8000		3,375 6,325	3374 6324
A10	Jiangsu Changsu Refrig. Plant (Changsu 3F) 1 CFC-11 production line, 1 CFC-12 production line, 1 CFC-113 production line and 1CFC-115 production line	CFC-11 CFC-12 CFC-113 CFC-115	10,000 5,000 4,000 200		7,960 2,597 3,086 20	7960 2780 2834 90
A7	Suzhou Xinye Chemical Co. Ltd. 2 CFC-11 production line	CFC-11	7,000		5,809	7408
B8	Zhejiang Linhai Limin Chem. Plant 2 CFC-12 production line and 1 CFC-13 production line	CFC-12 CFC-13	3,000 50		1,189 27	1189 27
B15	Fujian Shaowu Floro-chem. Plant 1 CFC-12 production line	CFC-12	3,500		979	980
B12	Zhejiang Dongyang Chem. Plant 1 CFC-12 production line	CFC-12	5,000		2,053	2051
A13	Guangdong Xiangsheng Chem. Co. Ltd. 1 CFC-12 production line	CFC-12	3,000		1,487	1601
A11	Jiangsu Changsu Yudong Chem. Plant 2 CFC-113 production line	CFC-113	1,000		544	544
B11	Zhejiang Chemical Research Institute 1 production line to produce CFC-114 and CFC-115	CFC-114 CFC-115	100 100		11 72	0 72
		CFC-11 CFC-12 CFC_13 CFC-113 CFC-114 CFC-115 Total	24,000 30,500 50 5,000 100 300 59,950		18,481 16,496 27 3,630 11 92 38,737	20,507 16,791 27 3378 0 162 40,865
				Grand Total of Parts 1 through 5	44,852	44,768

⁴: Quotas are tradable between enterprises after allocation, and consequently may not match production levels.

Table A.2: CFC Production in 1999 verified by CNAO Audit (Figures in MT ODP)

SRI no.	CFC producers	CFC 11	CFC 12	CFC 113	CFC 114	CFC 115	CFC13	Total
A8	Jiangsu Meilan Electric Chemical Plant	1,765	1,866					3,631
B14	Zhejiang Juhua Florochemical Company, Ltd.	3,374	6,324					9,698
B6	Shanghai Chlor-Alkail Chemical Co. Ltd.		687					687
A10	Jiangsu Changsu Refrigerant Plant (Changsu 3F)	7,960	2,779	2,834		90		13,664
B12	Zhejiang Dongyang Chemical Plant		2,052					2,051
B13	Zhejiang Lanxi Refrigerant Plant	786						785
A3	Shandong Dongyue Chemical Co. Ltd.***		1,042					1,042
B11	Zhejiang Chemical Research Institute					72		72
A9	Jiangsu Wuxi Hushan Refrigerant Plant	560						560
B3	Sicuan Zigong Refrigerant Plant	198						198
B2	Chongqing Tianyuan Huagong Chemical Plant General	14						14
B8	Zhejiang Linhai Limin Chemical Plant		1,188				26	1,215
A11	Jiangsu Changsu Yudong Chemical Plant			545				545
B15	Fujian Shaowu Floro-Chemical Plant		979					979
B7	Zhejiang Rui'an Haitian Chemical Co. Ltd.	617						617
A7	Suzhou Xinye Chemical Co. Ltd.	7,408	1,602					9,009
	Total	22,682	18,519	3,379	0	162	26	44,768

***: Shandong Dongyue was targeted for closure in 1999 because it had no production in 1997; however, it produced some CFCs in early 1999 before the agreement. There were fifteen other producers in the first year of the program.

Table A.3: CFC Production in 2000 (Figures in MT ODP) (Data up to June 30, 2000; to be updated at end-year)

SRI No.	CFC producers	CFC 11		CFC 12		CFC 113		CFC 114		CFC 115		CFC 13		Total	
		Quota	Actual Production	Quota	Actual Production	Quota	Actual Production	Quota	Actual Production	Quota	Actual Production	Quota	Actual Production	Quota	Actual Production
A8	Jiangsu Meilan Electric Chem. Plant	1,050	362	1,793	734									2,843	1,096
B14	Zhejiang Juhua Florochem. Com. Ltd.	4,339	2,485	7,760	4,420									12,099	6,905
A10	Jiangsu Changsu Refrig. Plant	10,232	4,731	2,739	2,117	3,036	1,469			20	33			16,027	8,350
A7	Suzhou Xinye Chemical Co. Ltd.	2,532	1,600											2,532	1,600
B8	Zhejiang Linhai Limin Chem. Plant			1,365	584							27	11	1,392	595
B15	Fujian Shaowu Floro-chem. Plant			1,159	549									1,159	549
B12	Zhejiang Dongyang Chem. Plant			2,219	871									2,219	871
A13	Guangdong Xiangsheng Chem. Co. Ltd.			1,100	683									1,100	683
A11	Jiangsu Changsu Yudong Chem. Plant					544	288							544	288
B11	Zhejiang Chemical Research Institute							11	0	72	41			83	41
	Total	18,153	9,178	18,135	9,958	3,580	1,757	11	0	92	74	27	11	39,998	20,978

There will be no trade in quotas between enterprises in 2000.

Table A.4 List of HCFC-22 producing plants in China

Name	Status
Fujian Shaowu Fluoro-Chemical Plant	<i>Also reported in 1999</i>
Guangdong Huiyang Chemical Plant	-do-
Hunan Zhuzhou Chemical Corporation (Group)	-do-
Jiangsu Changshu Refrigeration Plant	-do-
Jiangsu Changshu Elf Atochem 3F Co., Ltd.	-do-
Jiangsu Meilan Electric Chemical Plant	-do-
Liaoning Fuxin Fluoro-chemical Plant	-do-
Shanghai Chlor-Alkali Chemical Co. Ltd.	-do-
Sichuan Chenguang Chemical Research Institute Plant No.2	-do-
Sichuan Zigong Refrigeration Plant	-do-
Shandong Jinan 3F Chemical Co. Ltd.	-do-
Shandong Dongyue Chemical Co. Ltd.	-do-
Shandong Fire Extinguishing Agent Plant Shouguang Division	-do-
Sichuan Zigong Fujiang Chemical Plant	-do-
Wuhan Changjiang Chemical Plant	-do-
Zhejiang Juhua Fluoro-chemical Co. Ltd.	-do-
Zhejiang Dongyang Chemical Plant	-do-
Zhejiang Linhai Limin Chemical Plant	-do-
Zhejiang Yingpeng Chemical Co. Ltd.	-do-

PART B

2001 ANNUAL PROGRAM

Phaseout Objectives

1. The phaseout objective of the 2001 Annual Program is to ensure that CFC production in the year does not exceed 36,200 MT. China is requesting the release of the **third annual tranche of US\$ 13 million** as agreed in the overall CFC Production Sector Phaseout Plan to achieve this objective. It is envisaged that the US\$ 13 million will be allocated for closing CFC production lines or reducing production levels in some CFC enterprises which received production quota in 2001, for technical assistance activities, and for activities relating to substitute development.

Program Activities During the Year

2. **Policy actions.** In 2001, the following policies and measures will continue to be implemented by the Government. These policies are considered necessary for the success of a total CFC production phaseout in China.

- a) Tradable production quota – The regulation has been under implementation since 1999, and will continue.
- b) Export and import control mechanism – The Management Regulation on Export/Import Control of ODS, promulgated in December 1999 by SEPA in collaboration with Ministry of Foreign Trade and Economic Cooperation (MFTEC) and General Administration of Customs (GAC), covers all ODS as well as related equipment and facilities that produce or consume ODS. ODS Export/Import quota and permit systems have been adopted, and all enterprises wishing to export or import ODS must hold both a quota issued by SEPA and MFTEC, as well as specific export/import permits. GAC supervises exports and imports of ODS. China has also promulgated the Export/Import Control List of ODS in China (The First Group) in January, 2000. Under this regulation, China has banned exports and imports of CTC, and introduced quota and permit requirements exports and imports of CFC 11, 12, 113, 114 & 115, CFC 13, halon 1211 and halon 1301.

3. **Enterprise activities.** Through the interaction of production quota and bidding systems, bid winners would be granted funds for closure. All CFC reduction or closure contracts are expected to be signed by the end of 2000, but in any case will be signed no later than the end of the first quarter of 2001. Closure projects are expected to take effect from January 1, 2001 and to be completed by the end of June 2001.

4. **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 reference and detailed work programs will be agreed with the World Bank before implementation. Most of

these activities are expected to be completed within two years. Proposed 2001 TA activities include:

- a) A feasibility study of industrialized technology for CTC conversion to chloro-hydrocarbons other than CTC. There are currently more than 20 plants producing CTC with an annual production of 35,000 MT and total capacity of 70,000 MT in China. Because 90% of CTC production is used as specialized raw materials for CFCs, market prospects and profitability will deteriorate as CFC production is phased out. Two kinds of technical processes dominate CTC production, and it is intended to examine whether one or both are suitable technically and economically for conversion to production of chloro-hydrocarbons other than CTC. For this purpose, laboratory and pilot experiments must be conducted to determine technical and economic feasibility. Since the experiments under this TA are expected to take almost two years, the 2001 Annual Program will finance the laboratory experiments, and pilot experiment at selected enterprises will be financed by another TA in the 2002 annual program.
- 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 or relevant agencies; (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 2001 Annual Program, a workshop to evaluate progress in the phaseout program, including ODS production phaseout, consumption demand and substitutes supply, is included.
- c) Market prospects for closure and production enterprises. Based on the generally successful experience of this activity in previous years, a similar technical assistance package enabling both closure and production enterprises to carry out analysis and study of alternative commercial options, will be put into operation
- d) Recruitment of international technical consultants. Consultants will be recruited, where and when necessary, especially in the field of CTC conversion, to provide technical guidance to CTC conversion activities.
- e) Risk Assessment Study: This study was originally part of the UNEP Business plan for 2000, and has been transferred to the Bank after discussions during the July 2000 meeting of the ExCom. China and the Bank have been discussing the methodology and coverage of this study, and it will be included in the 2001 Annual Program activities after the TOR is agreed.
- f) SNAP – To guide the production and consumption of ODS substitutes in the years ahead, SEPA intends to issue a List for ODS Substitutes in China. For this purpose, it will carry out a comprehensive study, including a proposed collaborative study with the USEPA on its experience, a survey on production and application of substitutes in

the domestic market, and tests to identify the character of substitutes. TORs will be developed

- g) Performance Audit. A Performance audit is required under the CFC sector plan. The China National Audit Office (CNAO) has informed SEPA that, as the content of this audit is more substantive than the conventional financial audits, additional expenditures are necessary to finance this activity annually. A TOR for the 2000 performance audit will be agreed between the Bank and SEPA for this purpose by November 2000, and the audit is expected to be completed by June 30, 2001.
- h) Other TA activities that are necessary for effective phaseout may be developed during the year.

5. **Special Initiatives:** As the phaseout of ODS production proceeds, the demand for substitutes in the consumption sector has increased rapidly. The impact of the first two years of implementation of CFC sector plan equals a phaseout of more than 10,351 tons of CFC 11 and 12. The phaseout of CFC-11, which is the major foaming agent, has impacted on production in the foam sector, and there is an urgent need to move into production of substitutes such as Cyclopentane and HCFC-141b. The use of CFC-12 as refrigerant in air-conditioners installed in all newly produced cars will be forbidden from January 1, 2002. It is estimated that the demand for HFC-134a, presently the only substitute of CFC-12 in the MAC sector in China, will exceed 7,500 tons in 2005 in this sector alone, and could reach 19,000 tons by 2010. China therefore envisages an urgent need to initiate special initiatives to produce such substitutes to ensure that there is no shortfall in their supply. China therefore intends to review the scope of adequate domestic production of HFC134a. In the 1999 annual program, a TA activity was included to evaluate the bidding proposals on establishing a HFC 134a production facility. A bid winner was selected in June 2000 and a feasibility study for HFC-134a production has been initiated; the study is expected to be completed and evaluated in 2000. The study will be reviewed by the Chinese authorities, and if it is considered acceptable, China intends to support the establishment of a production facility for HFC-134a, and may provide financial support from grant proceeds, as provided under the provisions of maximum flexibility in section (d) of the Agreement for the China Production Sector.

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

TABLE B.1: 2001 ANNUAL PROGRAM
(AMOUNT IN US\$ MILLION)

CFC production phaseout targets						
	Funding (US\$ mill.)	2000 Quota ⁴ (MT)	Phaseout in 2001 (MT)	Allowed Production in 2001 ⁵ (MT)	Performance Indicators	Key Dates
CFC in terms of ODP	13	39,998	3,798	36,200	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 36,200 MT	1. Dec. 2000-June 2001 2. Dec. 2000-Dec. 2001 3. Dec.31, 2001
Policy Initiatives						
Initiatives	Funding	Performance Indicators			Key Dates	
1. Bidding system	incl.in TA n.a. n.a. n.a.	1. Training enterprises for bid preparation in the 2001 bidding 2. Determine winning enterprises for 2001 3. Sign closure contracts with bid winners 4. Implement closure contracts			1. Oct. 2000 2. by Dec. 2000 3. Dec. 2000 4. Dec. 2000-June 2001	
	incl. in TA	5 Train enterprises for bid preparation for 2002 bidding			5. Oct. 2001	
2. Tradable production quota for CFC producers	n.a.	1. Establish 2001 annual CFC production quota 2. Issue annual production quota to CFC producers for 2001			1. Feb. 2001 2. Feb. 2001	
3. Import/export trade management	n.a.	1. implement the import/export trade management mechanism.			1. January 2001-December 2001	
Enterprise activities						
	Funding (US\$ million)	Existing lines	# of lines targeted	# of lines at end of 2001	Performance Indicators	Key Dates
Closure of CFC11/12/113 production lines	12.00	17	t.b.d.	t.b.d.	1. Training of bidders 2. Bidding for grant funds 3. Selection of bid winners 4. Contracts signed 5. Facilities dismantled, and reports completed	1. Oct. 2000 2. Oct. 2000 3. by Dec.. 2000 4. end-Dec. 2000 5. no later than June 2001
Special Initiatives						
	Funding (US\$ million)					Key dates
HFC 134a Production	t.b.d.	Establishment of HFC-134a production facilities of up to 10,000 MT				t.b.d.

⁴ Total quota issued for 2000, compared with the amount allowed under the Phaseout Plan of 40,000 MT.

⁵ Maximum production quota that can be allocated for calendar 2001.

TABLE B.I: 2001 ANNUAL PROGRAM (CONT.)
(AMOUNT IN US\$ MILLION)

Technical assistance activities			
Activities	Funding ^{1/} (US\$ Million)	Performance Indicators	Key Dates
1. A feasibility study of industrialized technology for CTC conversion to chloro-hydrocarbon other than CTC	0.15	1. TOR to be agreed with the Bank 2. Select Contractor 3. Contract signing 4. Basic information gathering in China 5. Investigation abroad 6. Laboratory experiments 7. Seminar to discuss technology conversion 8. Final report	1. December 2000 2. Mid Feb. 2001 3. End March 2001 4. no later than May. 2001 5. no later than May. 2001 6. June 2001-Oct. 2002 7. no later than Nov. 2002 8. no later than Dec. 2002
2. Training	0.10	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 Project Implementation Manual 3. Seminar on review of ODS production phaseout	1. Oct. 2000 2. Start in Jan. 2001. Specific schedules to be detailed in TORs 3. Sept. 2001
3. 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 2001 2. Throughout 2001 3. Throughout 2001
4.Risk Analysis	0.20	TOR to be agreed with the Bank	By June 2001
5.SNAP	0.25	1 TOR to be agreed with the Bank 2 Select Contractor 3 Contract signing 4 Basic information gathering in China 5 Investigation abroad 6 Laboratory experiments 7 Seminar to discuss substitute list 8 Final report 9 Issue substitute list (first group)	1 December 2000 2 Mid Feb. 2001 3 End March 2001 4 no later than May. 2001 5 no later than May. 2001 6 June 2001-Oct. 2002 7 no later than Nov. 2002 8 no later than Dec. 2002 9 first half of year 2003
6.Market prospects for closure etc.	0.10	1. TOR to be agreed with the bank and 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.2001 2.June 2001 3. June 2001 4. July 2001 5. July-August 2001 6. Sept. 2002 7. Nov. 2002 8. End of 2002
Recruitment of international technical consultants	0.10		1. Throughout 2001-2002
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 2001.

**PROJECT EVALUATION SHEET
CHINA**

SECTOR: Refrigeration ODS use in sector (1999): 16,065 ODP tonnes

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

Project Titles:

- (a) Phaseout of CFC-11 by conversion to cyclopentane technology and CFC-12 by conversion to isobutane (600a) technology in the manufacture of domestic freezers at Qingdao Haier No. 2 Freezer Plant
 (b) Replacement of CFC-11 and CFC-12 with cyclopentane and isobutane in the production of refrigerators at Little Swan Electric (Jingzhou) Co. Ltd.

Project Data	Domestic	
	Qingdao Haier No. 2	Little Swan
Enterprise consumption (ODP tonnes)	180.83	211.95
Project impact (ODP tonnes)	180.83	211.95
Project duration (months)	36	36
Initial amount requested (US \$)	1,138,687	3,204,521
Final project cost (US \$):		
Incremental capital cost (a)	830,580	2,609,243
Contingency cost (b)	83,058	255,624
Incremental operating cost (c)	225,049	339,654
Total project cost (a+b+c)	1,138,687	3,204,521
Local ownership (%)	100%	100%
Export component (%)	0%	0%
Amount requested (US \$)	0	3,204,521
Cost effectiveness (US \$/kg.)	4.53	15.12
Counterpart funding confirmed?	Yes	Yes
National coordinating agency	SEPA	
Implementing agency	UNDP	UNIDO

Secretariat's Recommendations		
Amount recommended (US \$)		3,204,521
Project impact (ODP tonnes)		211.95
Cost effectiveness (US \$/kg)		15.12
Implementing agency support cost (US \$)		362,497
Total cost to Multilateral Fund (US \$)		3,567,018

PROJECT DESCRIPTION

Sector Background

- Latest available total ODS consumption (1998)	166,265.90 ODP tonnes
- Baseline consumption of Annex A Group I substances (CFCs)	57,818.00 ODP tonnes
- Consumption of Annex A Group I substances for the year 1998	55,414.00 ODP tonnes
- Baseline consumption of CFCs in refrigeration sector	Not available ODP tonnes
- Consumption of CFCs in refrigeration sector in 1998	23,178.00 ODP tonnes
- Funds approved for investment projects in refrigeration sector as of July 2000 (31st Meeting)	US\$147,713,196.00
- Quantity of CFC to be phased out in investment projects in refrigeration sector as of end of 1999	12,033.00 ODP tonnes

1. 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. Based on data reported by China to the Multilateral Fund Secretariat, the country is in compliance with the CFC freeze. In order to meet the 50% CFC reduction by 2005, an additional 302.45 ODP tonnes of CFC must be phased out.

2. According to information from the Government of China three projects for individual enterprises in the domestic refrigeration sector remain to be funded by the Multilateral Fund. Two projects have been submitted to the 32nd Meeting, one from UNDP and another UNIDO. The third one will be submitted to the 33rd Meeting of the Executive Committee. The remaining enterprises in the sector are small- and medium-sized. A terminal umbrella project covering about 20 such enterprises will be prepared and submitted at a later stage.

3. The Executive Committee has approved about US \$147,713,196 for 81 projects to phase out 12,033 ODP tonnes of CFC for enterprises manufacturing refrigeration equipment in the refrigeration sector in China.

Qingdao Haier

4. Haier Group is one of the largest manufacturers of domestic refrigerators and freezers in China whose market shares account for 33.44% of the refrigerators and 41.28% of the freezer markets in China. There are several factories and production lines for manufacturing refrigerators and freezers in different locations. All the refrigerator production lines have been converted to ODS-free production.

5. Three of the four freezer production lines were converted by UNDP with grants provided from the Multilateral Fund. One remaining production line at No. 2 Freezer Plant still uses CFC technology. The line was established in 1994-1995 and started production in June 1995.

6. The production line consumed 154.97 ODP tonnes of CFC-11 and 25.86 ODP tonnes of CFC-12 in the manufacture of domestic refrigeration equipment in 1999. Existing production equipment consist of one high pressure foaming machine which serves foaming jigs installed in the cabinet and door production lines. The factory is also equipped with assembly and refrigerant charging equipment.

7. Phase-out will be achieved by converting from CFC-11 to cyclopentane technology and from CFC-12 to isobutane (R600a) technology. The existing high pressure foam dispenser will be retrofitted for use with cyclopentane. The enterprise will require an additional mixing head, wagon system, pre-mixer station with intermediate tank, gas detection system, safety plant modifications, and a power generator. Other costs include commissioning, transportation, testing, trials, technical assistance and training. Incremental operating costs are requested by the enterprise for a period of six months reflecting the higher cost of chemicals and an increase in foam density.

Little Swan Electric Co.

8. The company was established in 1980. The production was 100,000 units in 1988. In 1994, the company expanded its production facilities by installing new CFC-based foaming and refrigerant charging equipment. In 1999, production reached 177,000 units. The enterprise consumed 177.3 ODP tonnes of CFC-11 and 35.8 ODP tonnes of CFC-12 in the manufacture of domestic refrigerators and freezers in 1999.

9. The project will to phase out consumption of 35.8 tonnes of CFC-12 and 177.3 tonnes of CFC-11 used in the production of refrigerators and freezers at Little Swan Electric Co. in China. The selected ODS substitutes are cyclopentane as a blowing agent and isobutane as a refrigerant. During the conversion process the present five high pressure foaming machines, the foaming fixtures and curing ovens installed in four cabinet plants and two door lines will be modified for cyclopentane. Two cyclopentane/polyol mixing stations will be installed. The cyclopentane storage, premixing and foaming areas will be equipped with the required safety ventilation, gas detector and fire extinguishing systems. The assembly lines will be equipped with 4 charging boards, five leak detectors, helium leak detection systems, and ultrasonic welding. Isobutane storage and safety system will be installed. The cost of engineering, commissioning, technology transfer, testing consultancy and training costs are included in the budget, while the company will upgrade its testing facilities on its own. Safety inspections and certification cost of the sites, and a 10% contingency are also requested in the proposal. Incremental operating costs are requested by the enterprise for a period of six months reflecting the higher cost of chemicals and an increase in foam density.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Qingdao Haier

1. The Executive Committee has approved the following technical assistance and investment projects for Haier, with a total value of US \$6,531,213.

- (i) Qingdao freezer conversion to a 50% reduction of CFC foam in freezer cabinets for the World Bank at a cost of US \$606,000 (approved at the 10th Meeting)
- (ii) Staged project on model prototype development and testing at the cost of US \$396,140 (stage 1a) (approved at the 10th Meeting as USA-China bilateral project)
- (iii) Staged project to produce CFC-free refrigerators: stage 1b: Field testing, stage 2: changeover of foam blowing agent to cyclopentane and refrigerant to isobutane in Haier at the cost of US \$2,980,793 (approved at the 16th Meeting as a USA-Germany-China bilateral project).
- (iv) A project for conversion of Haier freezer production capacity to cyclopentane and HFC-134a technologies at US \$2,548,280 (approved at the 19th Meeting for UNDP). The enterprise background information indicated that the production capacity had consisted of three production lines. One line was installed in Factory No. 1 and two lines in Factory No2. No other production equipment was identified at that time. The project document implied also that the total CFC consumption in the twelve months of August 1994 – July 1995 of 278.5 tonnes would be eliminated as a result of the proposed conversion.

2. Information in this, and previous project indicates that, in the period 1993-1995, while moving the earlier projects forward, the company was in the process of simultaneously installing new CFC-based production capacity, which might be eligible for assistance for conversion from the Multilateral Fund at a later stage. Non-ODS technology was readily available at that time but was evidently not selected by Haier for the new production line.

3. The project approved for UNDP in May 1996 for conversion of three freezer production lines had made no reference to the additional production line, which had been in operation for about one year by that time.

4. The Secretariat sought from UNDP confirmation on the date of installation of production capacity and reasons why the Executive Committee had not been informed of the existence of this line during consideration of previous projects.

5. UNDP explained that no information was provided to UNDP by Haier management regarding the newly installed CFC-based production line because of decentralized management and lack of coordination. The Secretariat noted that the subsequent relocation of the new line to the factory converted by UNDP under the project approved in May 1996 suggests that there was, indeed, close coordination between the factories. UNDP provided additional information indicating that equipment was installed in 1994 and production on the line commenced in June 1995.

6. The Secretariat has reviewed the incremental capital and operating costs and is currently discussing cost issues with UNDP. The results will be reported to the Sub-Committee on Project Review.

7. Noting the level of assistance provided to Haier from the Multilateral Fund (more than US \$6.5 million), Haier's situation as a multinational company exporting to more than 80 countries, with a U.S. subsidiary, American Haier, and that Haier installed the CFC-based production line while it was progressing projects to phase out CFC-based production elsewhere in its operations, the Executive Committee may wish to consider both the eligibility of this project and the priority which should be accorded to provision of funds for it.

8. The project is submitted for individual consideration.

Little Swan

9. The Secretariat has requested clarification from UNIDO regarding the dates of purchase and installation of various production equipment at Little Swan Company. UNIDO provided copies of relevant purchase contracts justifying that the installation of new production equipment took place in 1994 and production started in early 1995.

10. The Secretariat discussed with UNIDO incremental capital and operating costs. The number of new charging boards has been reduced taking into account the capacity of the new equipment to maintain the equivalent replacement. Helium leak detection systems were recognized as not essential for conversion. The cost of gas detection system has been reduced given the layout of the production and repair areas. The cost of retrofitting high pressure foaming machines has been adjusted to reflect the difference in retrofitting approaches of original suppliers of this equipment. One nitrogen generator of required capacity will be provided instead of the two units requested. The pre-mixing operations will be rationalized reflecting the existing layout of the production area. The incremental operating costs have been adjusted using more recent prices of chemicals in China.

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

RECOMMENDATIONS

1. The Fund Secretariat recommends blanket approval of the Little Swan project with the level of funding and associated support costs as indicated in the table 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 Little Swan Electric (Jingzhou) Co. Ltd.	3,204,521	362,497	UNIDO

**PROJECT EVALUATION SHEET
CHINA**

SECTOR: Solvent ODS use in sector (1999): 4,286 ODP tonnes

Sub-sector cost-effectiveness thresholds: CFC-113 US \$19.73/kg
TCA US \$38.50/kg

Project Titles:

- (a) Interim report and request for second payment on the implementation of the 2000-2001 annual programme under the China Solvent Sector Plan

Project Data	Multiple solvents
Enterprise consumption (ODP tonnes) Project impact (ODP tonnes) Project duration (months) Initial amount requested (US \$) Final project cost (US \$): Incremental capital cost (a) Contingency cost (b) Incremental operating cost (c) Total project cost (a+b+c) Local ownership (%) Export component (%) Amount requested (US \$) Cost effectiveness (US \$/kg.) Counterpart funding confirmed? National coordinating agency Implementing agency	 6,955,000 100% 0% 0 UNDP

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

Interim Report and Request for Second Payment on the Implementation of the 2000-2001
Annual Programme under the China Solvent Sector Plan

**PART A:
SECRETARIAT'S COMMENTS AND RECOMMENDATIONS**

1. UNDP has submitted for the consideration of the Executive Committee:
 - (a) an interim report on Implementation of the Solvent Sector Plan for ODS Phase-out in China, in support of a request for approval of the balance of the funding for the first implementation programme, 2000-2001, namely US \$6.955 million plus support costs of US \$695,500.
 - (b) a proposed amended first implementation programme for 2000 – 2001.

Interim Report

2. The interim report advises that the activities foreshadowed in the 2000-2001 implementation programme considered at the 30th Meeting are proceeding, but with a delay of about two months due to the need to complete essential promotional work with enterprises and industrial associations and workshops training, seminars and exchanges on alternative technologies. UNDP has advised that this delay will not affect achievement of the 2001 reduction targets because an import and export ban on CFC-113 will commence on 1 January 2001 (an advance of six months on the date originally proposed) and production of CFC-113 in China will be reduced to the level required, that is 2700 ODP tonnes.

3. The 2-month delay means that the target date for signature of the first round of ODS reduction contracts has slipped from September to November 2000. The interim report indicates that bidding has been initiated. UNDP plans to provide an oral report at the 32nd Meeting to confirm that the contracts were completed as currently indicated.

4. The agreement between the Executive Committee and the Government of China concluded at the 30th Meeting indicated that “an additional US \$6.955 million will be made available in January 2001 for the period January 2001 through December 2001, upon satisfactory verification that China has finished the bidding process for phase-out in 2001, to be reported at the 32nd meeting of the Executive Committee.

Revised implementation programme

5. The Government of China has prepared a revision to the first implementation programme on the advice of UNDP, arising from China's wish to undertake a significant reallocation of funds within the 2000-2001 programme. China proposes to reduce the funding allocated to reduction contracts by US \$2 million and redirect this amount to a new activity, namely development and production of alternative solvents. This and all other proposed revisions are

indicated in Table 1 below. All other activities remain as proposed in the original implementation programme.

Table 1

Component	Original	Revised
Change in Schedule		
Sign 2000 ODS Reduction Contract	September 2000	November 2000
Sign 2001 ODS Reduction Contract	January 2001	June 2001
Controlling Import and Export of ODS solvent	July 1, 2001	Control: July 1, 2000 Ban: January 1, 2001 TCA export ban: January 1, 2000
Public Awareness	Start no later than April 2000	Start no later than July 2000
Preparation for the development of a ODS solvent management plan	Start no later than July 2000	Start no later than September 2000
Establishment of Standards and Technical Norms	Contract signed no later than July 2000	Contract to be signed in October 2000
Cost Reallocation		
CFC-113 Reduction Contract	\$4.8 million in 2000; \$4.8 million in 2001	\$4.5 million in 2000 \$5.0 million in 2001
TCA Reduction Contract	\$1.45 million in 2000 \$1.455 million in 2001	\$0.5 million in 2000 \$0.505 million in 2001
Development and Production of Alternative Solvents	None	\$1.25 million in 2000 \$0.75 million in 2001
Public Awareness	\$100,000	\$70,000
Training	\$120,000	\$90,000
Strengthening ATSS	\$180,000	\$170,000
Consultants	None	\$70,000
Total cost reallocation	\$12,905,000	\$12,905,000

6. UNDP has indicated that while the ODS Reduction Contracts and Voucher Systems for CFC-113 and TCA will be reduced in 2000 and 2001 by US \$2 million; China strongly believes that it will still be able to phase-out the level of consumption required to meet the 2001 and 2002 control targets, as stipulated in the Agreement. China anticipates that the bidding will result in a lower phase-out cost per ODP tonne than previously budgeted for, therefore the reduced allocation will still be sufficient to cover the cost of the 2000 and 2001 ODS Reduction Contracts.

7. In regard to the new provision of US \$70,000 for consultants, UNDP has advised that there is no change to proposed activities but the reallocation of funds aligns better with UNDP's budget classifications.

8. The revised plan includes a proposal to allocate US \$2.0 million from the first implementation programme for “selection and development of new solvents”, including consideration of the use and production of n-propyl bromide (nPB), which has a small ODP and is currently under investigation by the Scientific Assessment Panel (SAP) and the TEAP at the request of the Parties. The Secretariat sought additional information on: why a major proposed expenditure of this nature had not been foreshadowed in the original strategy approved only this year; what was actually proposed to be funded, and; an explanation of the proposal to use nPB in the light of Decision X/8 which encourages Parties, in the light of reports from the SAP and the TEAP, to take measures actively as appropriate to discourage the production and marketing of new ozone depleting substances.

9. UNDP advised that a cleaning solvent called HEP-2 containing about 70 percent nPB is currently being imported from the USA, where it is in use, at 1.5 to 2 times the current local price of CFC-113. Realising the importance and necessity of developing local alternative solvents to provide sufficient good quality products at a reasonable price, China will support the development and production of this solvent. It has been provided by SEPA to enterprises as one of the alternatives to be used in preparing for the bidding for first year phase-out contracts. If a winning enterprise chooses to use this product as an alternative solvent, China will approve its usage in appropriate applications. However China will also ensure that the decisions of the Parties and the Executive Committee regarding the usage of these alternative solvents will be strictly followed.

10. UNDP advised that nPB-based solvents have similar physical properties to CFC-113 and TCA and can be used in many applications, for example in production of liquid crystal displays and for metal cleaning. The Secretariat understands that these solvents can often be used in existing equipment – obviating the need to change to aqueous-based machinery, and thus reducing the cost of phaseout.

11. The second solvent referred to for local development and production has the title HT-1 and is said to contain “hydrate-carbon”. This is presumed to mean that it is a hydrocarbon, but at the time of preparation of this report, UNDP has not been able to provide clarification as to the substance used. It is said to be zero-ODP, non-toxic and to have been used in the aviation industry in China for several years.

RECOMMENDATION

1. The Executive Committee might wish to consider the funding requested for 2001 on the basis of the above comments, the oral report on progress with ODS reduction contracts to be presented by UNDP at the meeting, and taking into account the Committee’s views on the proposed reallocation of funds for development and production of alternative solvents, including nPB.

PART B

INTERIM REPORT AND REQUEST FOR SECOND PAYMENT ON THE IMPLEMENTATION OF THE 2000-2001 ANNUAL PROGRAMME UNDER THE CHINA SOLVENT SECTOR PLAN

Prepared by
State Environmental Protection Administration (SEPA), China
and
United Nations Development Programme (UNDP)

BACKGROUND

At its 30th Meeting held in Montreal 29-31 March 2000, the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol (ExCom), by Decision 30/56, approved the 29 March 2000 “Agreement for ODS Phaseout in China’s Solvent Sector” on the phaseout of ozone-depleting substances (ODS) in China’s solvent sector at a total cost of \$52 million to the Multilateral Fund (MLF).

The Agreement is for the phased reduction and complete phaseout of the consumption of trichlorotrifluoroethane (CFC-113) and 1,1,1 trichloroethane (TCA), as well as the consumption of carbon tetrachloride (CTC) used as cleaning solvents in China.

The \$52 million would be paid out in installments over an eleven-year period in the exact amount of US dollars as specified in the Agreement, starting in the year 2000 and ending in 2010. By the approval of the Agreement, China committed that in exchange for the funding level specified, it will eliminate its total non-exempt CFC-113 and TCA consumption, as well as its total CTC consumption for solvent use in accordance with an agreed schedule. China further agreed that total non-exempt CFC-113 and TCA consumption in China, as well as the total consumption of CTC in the solvent sector in China will not exceed the levels agreed for specific chemicals in each of the year up to 2010.

China will phase out its CFC-113 consumption by 1 January 2006 and its CTC consumption by 1 January 2004, save for consumption of these two ODS for feedstock and process agent uses, and for CFC-113 consumption and CTC solvent consumption that may be agreed by the Parties to be essential for China after 2010. TCA will be totally phased out by 1 January 2010, save for any TCA solvent consumption that may be agreed by the Parties to be essential for China after 2015.

The United Nations Development Programme (UNDP) has agreed to be the implementing agency for this project for the first three years at a fee of 10% of funds allocated during that period. The fees for future years will be agreed between the Executive Committee and the implementing agency for the project.

ACTIVITIES UNDERTAKEN

Immediately after the approval of the Agreement, SEPA and UNDP held many discussions on implementation arrangements and preparation of workplans. The project document was signed by SEPA and UNDP in June 2000. The draft Project Implementation Manual (PIM) was reviewed, finalized and agreed by SEPA and UNDP in June 2000.

A Domestic Implementing Agency (DIA) was to be selected to assist SEPA in undertaking the day-to-day operational activities to facilitate enterprise level phaseout. Shortlisting of qualified bidders for the selection of DIA started in April 2000. Bidding for the DIA was initiated by the end of June 2000. Bid evaluation took place late August 2000 and the selection of DIA was approved by UNDP headquarters in September 2000. A contractual agreement is now being finalized by UNDP.

In June 2000, SEPA conducted a seminar for the industrial associations and national experts to introduce the Solvent Sector Plan, to initiate action to organize the Alternative Technology Support System (ATSS), to discuss the operational mechanism, to obtain updated information on current cleaning technologies and trends in each industrial sector, and to identify and assess alternative solvents and conversion technologies for different ODS solvent consuming sub-sectors. In addition, development of alternative solvent technologies was discussed.

In July, international and national experts met together to further develop the sector phaseout plan in defining the phaseout priorities, set time schedules, identify technical options and funding level for phaseout in each sub-sector. National experts gained experience through exchanges with international experts. Phaseout schedules were refined and preparation for the first bidding of ODS Reduction Contracts were carried out.

In early August 2000, SEPA and Ministry of Information Industry (MII) convened a National Conference for the Implementation of Solvent Sector Plan to publicize the Solvent Sector Plan and to mobilize related industrial associations, enterprises and research institutes to participate and facilitate in the phaseout activities. 42 enterprises, most of them large CFC-113 consumers, participated in the conference and would be candidates of phaseout in the First Annual Programme. Industrial associations, research institutes and technical committees also made presentations on alternative solvents currently under development and on substitution technologies available in different sub-sectors.

Bidding documents for ODS Reduction Contracts to phase out the amount of ODP required to meet the 2001 targets were sent out in September 2000 to 30 large liquid crystal display (LCD) manufacturers and other solvent consuming enterprises. All these enterprises have pre-registered their interest in converting to non-ODS cleaning technologies. The consumption of these enterprises is more than 640 MT CFC-113. It is expected that ODS Reduction Contracts in excess of the required 2000 reduction of 466 MT CFC-113 will be signed. Closing date for submission of bid is 6 November 2000 and it will be followed by two weeks of bid evaluation. ODS Reduction Contracts will be signed with the selected successful bidding enterprises by 24 November 2000.

Due to the time required to complete some of preparatory works that are critical to the successful initiation of enterprise level phaseout activities, the initiation of the first year bidding process was delayed and subsequently the signing of the ODS Reduction Contracts will be delayed for about two months, from September 2000 to November 2000. This two-month delay will not affect China's achieving its 2001 CFC-113 and TCA reduction target levels. China will reduce CFC-113 production level to 2,700 tons in 2001 and import and export ban of CFC-113 will be in effect January 1, 2001, therefore the consumption of CFC-113 at the national level will be less than 2,700 ODP tonnes, ensuring China will meet the 2001 control target.

While all key components of the technical assistance activities were initiated, the initiation of two activities were delayed for about three months in order to allow staff to concentrate on the preparation and kick-off of the first bidding process.

To better align with UNDP's budget classification, the cost allocations among some of the technical assistance components have been rearranged with part of the allocation moved to the "consultants" category, however the purpose of the usage of these funds has not been changed.

2001 FUNDING

In approving the Agreement, the ExCom approved the release of the 2000 funding level of \$6.75 million to facilitate China's initiation of activities to meet the 2001 reduction target levels as well as work towards achieving future years' reduction targets. The ExCom also decided that an additional amount of \$6.955 for the year 2001 would be made available to China, for the period January 2001 through December 2001, upon satisfactory verification that China has finished the bidding process for phaseout in 2001. China and UNDP are to provide such report at the 32nd Meeting of the ExCom.

Bidding process for ODS phaseout for 2001 is currently in progress with a bid closing deadline of 6 November 2000. As the ODS Reduction Contracts can only be signed at the conclusion of a careful bid evaluation to be completed towards the end of November 2000, SEPA and UNDP can only report at the time of submitting this report (11 October 2000) that the bidding has been initiated and that the entire process will be completed by the time the 32nd ExCom Meeting is in session. SEPA and UNDP will present an oral report during the 32nd ExCom Meeting on the final result of the bidding process, in order for the Executive Committee to approve the release of the 2001 funding in the amount of \$6.955 million in January 2001.

DEVELOPMENT AND INVESTMENT OF ALTERNATIVE SOLVENT PRODUCTION

During the preparation for the implementation of the Solvent Sector Plan, China realizes that the most important challenge for a successful and smooth phaseout in the solvent sector is the sufficient availability of good quality alternatives at reasonable low price. At present, China imports most of the alternative solvents at very high price which is a major obstacle to getting the interest of enterprises to participate in phaseout activities. Some local enterprises have embarked on the development and production of alternative solvents and equipment. SEPA strongly

believes that one important activity in the successful implementation of the Solvent Sector Plan is to assist these local enterprises in the development of these alternative solvents that are identified to be of good potential substitutes and to provide investment in building up their production capacity in order to provide sufficient supply to current ODS solvent consumers. The matter was discussed in many occasions between SEPA and UNDP.

Two locally developed alternative solvents, HEP-2 (including nPB) and HT-1 have been evaluated by Chinese industries and found to be economically and technically acceptable alternative solvents. Testing and pilot production in some sub-sectors have proven to be effective and their use being accepted by those enterprises.

HEP-2 is a chemical mixture, its main component is nPB (60-70%) and 3 other non-ODS, non-toxic chemicals. Its physical property is quite similar to TCA and can be used for cleaning instead of CFC-113 and TCA in many applications, such as LCD and metal cleaning. At present, HEP-2 is imported from USA at 1.5 to 2 times the price of CFC-113. As HEP-2 is produced and used in America and its cleaning property has been proven by testing and pilot production in China, SEPA has provided to the enterprises as one of the alternative solvents to be used in preparing for the first year bidding.

HT-1 is a locally produced co-solvent. Its main component is hydrate-carbon. It has zero ODP and has no toxicity. HT-1 was used safely for several years in aviation industry in China. It cannot be used widely as CFC-113 and TCA, but it can be used as one alternative option for ODS phaseout in some sub-sectors and enterprises.

While China understands that nPB is a low ODP substance and that the Scientific Assessment Panel and the TEAP are evaluating nPB and will draft new report regarding its ODP value and toxicity, China will abide by the decisions made by the Parties and the Executive Committee regarding its usage.

Realizing the importance and necessity of developing local alternative solvents to provide sufficient good quality at reasonable price to enterprises that will undertake ODS phaseout activities, China will support the development and production of HEP-2 and HT-1. If a winning enterprise in the bidding process chooses to use HEP-2 as an alternative solvent, China will approve its usage in the appropriate applications. China will ensure that the decision of the Parties and the Executive Committee regarding the usage of these alternative solvents will be strictly followed.

To meet the requirement of the development and production of alternative solvents, a total of \$2 million was reduced from the ODS Reduction Contracts and Voucher System in 2000 and 2001, to be reallocated to the development and production of alternative solvents. SEPA has revised the 2000 – 2001 Annual Programme to include this support.

While \$2 million will be deployed from the ODS Reduction Contracts and Voucher Systems of CFC-113 and TCA in 2000 and 2001 to provide for the development cost and investment capital for alternative solvents, China strongly believe that even with the \$2 million reduction, it will still

be able to sign sufficient ODS Reduction Contracts to phaseout the level of consumption required to meet the 2001 and 2002 control targets, as stipulated in the Agreement. This will be achieved through the bidding system which China anticipates that the bidding will result in a lower phaseout cost per ODP tonne, therefore the reduced allocation will still be sufficient to cover the cost of the 2000 and 2001 ODS Reduction Contracts.

ACTION REQUESTED

The amended 2000 – 2001 Annual Programme is attached herewith for the review and approval of the Executive Committee.

At the 32nd Executive Committee Meeting to be held 6-8 December 200, SEPA and UNDP will present an oral addendum to this report on the result of the 2000 bidding for the ExCom to approve the release of the 2001 funding of \$6.955 million in January 2001.

SOLVENT SECTOR PLAN
FOR ODS PHASEOUT IN CHINA

Amendment of
FIRST IMPLEMENTATION PROGRAMME

(July 1, 2000 – December 31, 2001)

Date of Amendment: 10 October, 2000

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Solvent Sector Plan for ODS Phaseout in China

First Implementation Programme

A. Background

Solvent Sector Plan for ODS Phaseout in China was approved at the 30th Executive Committee (ExCom) Meeting in March 2000. The ExCom, by Decision 30/56 approved the 29 March 2000 "Agreement for ODS Phaseout in China's Solvent Sector" with total funding of US\$52 million. United Nation Development Programme (UNDP) agreed to be the international implementing agency of this programme for the first three years at a fee of 10% of funds allocated during that period. The execution duration of First Implementation Programme of China's Solvent Sector Plan is from July 1, 2000 to December 31, 2001. Before the end of June 2000, UNDP and SEPA signed the Project Document of Solvent Sector Plan for ODS Phaseout in China and the draft Project Implementation Manual (PIM) for this sector plan was finalized and agreed upon. Based on the Project Document and the PIM, Request for Proposal for the selection of a Domestic Implementing Agency (DIA) was issued to 9 selected potential bidders on 28 June 2000. The bid evaluation of the DIA was completed before the end of August 2000 and a Chinese enterprise based in Beijing was selected to be the DIA. The selection was approved by the UNDP headquarter in September 2000.

On 9-11 August 2000, SEPA and the Ministry of Information Industry (MII) organized a Nation Conference for the Implementation of Solvent Sector Plan. 42 enterprises participated in the meeting, most of them are large CFC-113 consumers and will be candidates of ODS solvent phaseout project for the First Annual Programme. The Alternative Technology Support System (ATSS) was developed during the pre-session on 8 August 2000. The ATSS consists of national expert group (12 candidates), 6 industrial associations, 3 alternative technology support centers (research institutes) and more than 20 alternative solvent and equipment suppliers.

To meet the requirement in the Agreement for ODS Phaseout in China's Solvent Sector, the DIA, in cooperation with the Special Working Group for Solvent (SWG) under the Foreign Economic Cooperation Office (FECO) of SEPA, prepared the Bidding Document that was issued to 30 large CFC-113 consumers and invited these enterprises to participate in the bidding for the 2001 ODS Reduction Contracts. All these enterprises have been pre-registered and have expressed their interest on non-ODS cleaning technology conversion. Total consumption of these consumers is more than 640 MT CFC-113 in last year, and 466 MT CFC-113 reduction contracts are expected to be signed before 24 November 2000 through this bidding process.

In preparation for the implementation of the Solvent Sector Plan, China realizes that the most important challenge is to provide sufficient alternative solvents and equipment at reasonable price in good quality to the market. At present in China, the imported alternatives are all at very high price and most Chinese enterprises can not afford it. Some local enterprises can provide some alternative solvents and equipment but the supply is still at low quantities. Therefore, FECO/SEPA and MII plan to support and expand the local alternative production capacity in the Solvent Sector Plan so as to meet the requirements of the ODS solvents phaseout. China believes that this is the best way to reach the ODS solvents phaseout target and will make project implementation more smoothly and successfully.

On the basis of half year preparation for the implementation of Solvent Sector Plan, China amends the First Implementation Programme (2000-2001) with addition of support to local alternatives development and production, reallocation of budget for some of the technical assistance activities, reschedule of the 2000 and 2001 bidding process but with no changes on the phaseout target.

B. Phaseout Scope and Approach

The Solvent Sector Plan uses a phased, performance-based approach as described in detail in the final version of "Solvent Sector Plan For ODS Phaseout in China" (March 30, 2000) to phaseout consumption of CFC-113, TCA and CTC in cleaning applications and development and implementation of an Alternative Technology Support (and delivery) System (ATSS). The scope of the First Implementation Programme is now amended to include the development and investment of alternative solvents indicated in vi):

- i.) Develop and begin implementation of the ATSS for all solvents and technologies;
- ii.) Develop and begin implementation of the Voucher System for small solvent users;
- iii.) Undertake and complete ODS Reduction Contracts with about 20-40 large and medium user enterprises and redeem vouchers with about 100 small users in the second year to eliminate consumption of 466 MT tons CFC-113 and 100 MT tons TCA by the end of 2001; (the contracts will give a total reduction of 1,121 MT tons for CFC-113 and 200 MT tons for TCA, with the balance resulting in reductions in 2002)
- iv.) Undertake technical assistance activities described in Table 3;
- v.) Undertake policy action described in Table 3; and
- vi.) Develop of alternative solvents and initiate investment to increase capacity of local production, Table 4.

C. Actions and Proposed Funding

Solvent consumption phaseout requires implementation of investment projects at the enterprise level, with, on the average, about one year lag between local funding approval at the enterprise level and commissioning of non-ODS technology system. Thus, this First Implementation Programme covers funding for 18 months, with the first ODS phaseout results being achieved in 2001 and additional results achieved in 2002. Activities and proposed funding for the Implementation Programme are summarized in Table 1 and shown, respectively, for 2000 (six months) and for 2001 (for 12 months). The funding allocation for ODS Consumption Reduction Contracts and for Development and Investment on Alternative Solvents Production may be slightly adjusted based on phaseout cost requirement at enterprises level. Details are given in Table 2 to Table 4. Performance indicators are shown in Table 5.

At its 30th Meeting, the Executive Committee approved the payment of US\$ 6.75 million for China to implement the First Implementation Programme, to cover the period from July 1, 2000 through December 31, 2000. The ExCom also decided that an additional US \$6.955 million will be made available in January 2001, for the period January 2001 through December 2001, upon satisfactory verification that China has finished the bidding process for phaseout in 2001, to be reported at the 32nd Meeting of the Executive Committee.

At the conclusion of the First Implementation Programme, China will have reduced CFC-113 consumption to 3,375 MT tons (ODS) during calendar year 2001, and 2,750 MT tons (ODS) CFC-113 in 2002, including phaseout results from ongoing projects.

Table 1 Activities and Proposed Funding (US\$ 1,000)

Enterprise Level Actions	2000	2001
ODS Consumption Reduction Contracts (or vouchers redeemed) 2000/2001 1,121 tons CFC-113* estimated 20-40 larger and medium users of CFC-113	4,500	5,000
2001 estimated 100 small users of CFC-113 under voucher system 2000/2001 200 tons TCA under above ODS Reduction Contracts	500	505
Development and Investment on Alternative Solvents Production	1,250	750
Technical Assistance, including policy actions and development of ATSS	500	700
Proposed Funding	6,750	6,955

* The contracted phaseout target will be properly higher than 1,121 tons CFC-113 to safely meet the agreed phaseout target.

D. Enterprise Level Actions

Enterprise level activities focus on identifying, funding and implementing about 20-40 large and medium sized projects during 2000-2001, identifying and completing about 100 small sized projects through redeemed vouchers in 2001, plus identifying projects that would be funded in the Second Annual Implementation Programme (2002). Project identification will be carried out in several ways. UNDP will take an active role in identification/development of phaseout projects, but the principal focus will be on use of local resources including PMO, DIA, MII, ATSS agencies, technical institutions and local consultants. Promotional work will include dealers, equipment manufacturers, provincial level industrial bureaus and use of media outlets.

Projects to be implemented in the first year will require that ODS Reduction Contracts be signed by November 2000. PMO has undertaken an accelerated action plan to identify, bid and negotiate these contracts starting in September 2000. The focus will be on the larger enterprises in sub-sectors such as LCD. These sub-sector enterprises have already initiated action on early ODS phaseout and are well positioned to have contracts signed by November 2000. This expedited action has been done in parallel with the development of the formal bidding system and selection of DIA. The bidding for the second group of projects will proceed in early 2001 under the normal operational procedures as described in Chapter VI of the Solvent Sector Plan.

Table 2 Implementation Programme - Phaseout Targets and Enterprise Activities (July 1, 2000 – December 31, 2001)

SOLVENT CONSUMPTION PHASEOUT TARGETS & ACTIVITIES (CFC-113 and TCA)							
	MLF \$ million Requested	Start of programme (MT)	Reduction Target (MT)	Reduction Contract (MT)	End of programme (MT)	Key Actions Required	Key Dates
CFC-113 Domestic consumption	4.5(2000) 5.0(2001) Total 9.5		466	1,121		Conversion of ODS solvent enterprises to non-ODS cleaning technology	July 1, 2000 – Dec 31, 2001
CFC-113 Import		149	149		0	Ban on import and management on export	
Ongoing project			600				
Consumption Phaseout target		4,441	1066		3,375		By December 31, 2001

TCA	0.5(2000) 0.505 (2001)	6,230	100	100	6,130	Require all ODS reduction contracts to include 100% of all solvent use by enterprise bidding	
ENTERPRISE-LEVEL ACTIVITIES (For CFC-113 and TCA)							
	Estimated MLF \$ million requested		# of enterprises targeted		Key Actions Required		Key Dates
1. Conversion of ODS consumers	CFC-113	4.5 (2000)	1. L/M: 20-40 (2000 and 2001)		1. Sign ODS reduction Contracts (20-40)	1. 2000 Bid winners and contracts signed by November 2000; 2001 Bid winners and contracts signed by June 2001	
	CFC-113	5.0 (2001)					
	TCA (2000)	0.5	2. Small: 100 (2001)		2. Redeem vouchers with 100 small users	2. During 2001	
TCA (2001)	0.505	Included in L/M contracts					

E. Development of Alternative Technology Support System

The ATSS consists of national solvent expert group, three technology institutes, industrial associations, a small number (about 5 to begin with) of equipment suppliers, several solvent producers and selected solvent dealers that will supply technology and technical assistance to ODS solvent users. The ATSS will have the technical ability and experience to supply alternative cleaning technologies and equipment, and will develop technical support capability to assist small solvent users/customers regarding their selection of the most appropriate option for moving to a non-ODS operating design. The ATSS will be developed during 2000 and begin delivering its technical services and equipment during 2001.

F. Policy Actions

The following policies will be promulgated to support implementation of the First Implementation Programme and the overall Solvent Sector Plan:

- (a) *Bidding* -- A bidding system for consumption phaseout will be implemented following approval of this Implementation Programme. Recipient enterprises will be determined through a bidding procedure administrated by DIA/PMO. The lowest bidders will be awarded grant funds after bid evaluation. PMO will sign ODS Reduction Contracts with the winning enterprises.
- (b) *Production quota* -- A regulation on a production quota for CFC-113 is being implemented under the CFC Production Sector Plan. The production quota of CFC-113 for 2000 is 4,125 tons ODS (3,300 tons ODP) and for 2001, 3,375 tons ODS (2,700 tons ODP). This is the key policy instrument for accomplishing the phaseout objective.
- (c) *Banning newly-built equipment which produces or uses ODS*:--On Nov. 11, 1997, SEPA together with other ministries promulgated "The notice on banning newly-built enterprises which produce or use ODS". It is very important to continue to implement

the Notice and to achieve sustainable phaseout results. SEPA will disseminate details of the notice to all prospective consumers through various channels (news media, bulletin, propaganda.)

- (d) Phaseout for enterprise ineligible under MLF guidelines with respect to foreign ownership or export share of output should phaseout ODS solvents by their own resources and on a schedule consistent with the overall solvent phaseout schedule.
- (e) *Controlling supply and consumption of ODS solvent* -- The following regulation will be implemented to control supply and consumption of solvent:
 - (i) Imports and exports: CFC-113 imports and exports will be controlled in 2000 and banned after January 1, 2001; import and export of TCA will be controlled after July 1, 2000 and export ban on TCA will be added after January 1, 2001.
 - (ii) Local production of CFC-113 will be controlled under the CFC Production Sector Plan and production of TCA is expected to be controlled under the CTC/TCA Production Sector Plan now being prepared by SEPA and the World Bank;
 - (iii) Enterprises that implement projects under the Solvent Sector Plan will not be permitted to use any ODS solvent after their respective projects are completed.
 - (iv) Ban on use of new solvent with higher ODP: after January 1, 2001, solvent users will not be permitted to switch to different solvent with higher ODP.
- (f) *Establishment of standards and technical norms* -- These standards will be developed in TA activities as described below.

G. Technical assistance (TA) activities

TA activities concentrate on:

- (i) strengthening the overall institutional framework;
- (ii) management, monitoring and evaluation capabilities of participating institutions;
- (iii) training enterprise managers, technical personnel and decision makers at various levels,
- (iv) development of the Alternative Technology Support System.

All terms of references and work schedule will be agreed with UNDP prior to signing contracts and initiating work.

Main TA activities include:

- (a) *Development of a Management Information System (MIS) for ODS solvent phaseout in the solvent sector* - The MIS is an important tool in management and supervision of all phaseout activities. It is used to monitor performance in the solvent phaseout and to generate progress reports on implementation of the Solvent Sector Plan required by ExCom and UNDP. An information management center will be established in PMO and two sub-stations in MII and DIA.
- (b) *Public Awareness Campaigns* -- Introduce and publicize Solvent Sector Plan and ODS solvent phaseout schedule in newspaper and other media to make people, especially the ODS solvent users to understand the phaseout plan. Provide information and guidance to the related enterprises to make them aware of how to prepare and take part in the phaseout actions.
- (c) *Training of personnel involved in implementation of phaseout activities* -- It is necessary to provide training for: 1) environmental staff and decision makers to increase their

recognition and management capacity, 2) industrial managers and technicians to enhance their understanding of alternative technology and to master how to use it, 3) ODS and substitute solvent dealers to deliver information on update alternative non-ODS solvent technology to their users, especially for SME. Training is needed to prepare enterprises to bid in the following year, to supervise solvent production and consumption, to manage and monitor ODS import and export, and to learn operating procedures in the solvent sector phaseout approach. This type of training will need to be repeated every year in the first few years of implementation.

- (d) *Developing Alternative Technology Support System* -- The ATSS will include three technical support centers (including No. 46 Institute funded by MLF, one institute in Shanghai funded by Swedish Government and a third center in Guangdong being developed), national solvent expert group, plus dealers, procurement agent(s) and local equipment suppliers. The support system will provide services such as technical consulting and support and includes development of a promotion and delivery system to reach the many small solvent users, as well as development and promotion of low cost alternate solvents and development and promotion of low cost local equipment and low cost conversion processes.
- (e) *Establishment of a Third Technical Center*: Proposed in Guangdong to be developed in 2000/2001. The scope and objectives of the third technical support center will be substantially the same as for the first two centers.
- (f) *Establishment of standards and technical norms*:
 - 1) Production safety regulations on using flammable substances as solvent;
 - 2) Environmental regulations on using toxic substances as solvents;
 - 3) Related environmental regulations on solvents without ODS;
 - 4) Technology identification of solvent without ODS;
 - 5) Standards for quality identification of solvents without ODS.
 - 6) Standards for non-ODS alternative cleaning technologies.
- (g) *Preparation for the development of a solvent management plan* -- The Solvent Sector Phaseout Plan lays out principles for establishment of a solvent management plan. This represents only the first stage of development to initiate all preparatory work. Issues and activities are highlighted below:
 - (i) Rapid phaseout of ODS solvent production in China will cause demand after 2010 to be covered increasingly by substitutes. This makes it imperative that preparation work for the development of ODS substitutes to start in 2000. Preparation of the plan will draw on experiences from developed countries.
 - (ii) Determine essential and necessary usage in the solvent sector.
 - (iii) Conduct survey and study on the alternative solvents, and assist in the selection of alternatives, testing, tryout and spreading of ODS substitute activities in selected enterprises through demonstration.
- (h) *National and International Consultants* -- Recruit national and international consultants to provide alternative technical services for training and technical conversion guidance to ODS solvent users.

The above policy initiatives, enterprise-level and technical assistance activities are summarized in Table 3 below.

Table 3 Implementation Programme - Policies and TA Activities

(July 1, 2000 – December 31, 2001)

POLICY INITIATIVES			
ACTIVITIES	Actions Required		Key Dates
1. Bidding system	1. Establish operating procedures; 2. Train enterprises for bid preparation 3. Determine winning enterprises 4. Sign ODS Reduction Contracts; 5. Implement ODS Reduction Contracts.		1. System in place by July, 2000 2. July-August 2000 for 2000 activities & March-April 2001 for 2001 activities 3. By November 2000 and June 2001 4. By November 2000 and June 2001 5. After November 2000, for 12-18 month implementation period
2. Production Quota	1. The production quota of CFC-113 for 2000 will not exceed 4,125 tons ODS (3,300 tons ODP) 2. For 2001 will not exceed 3,375 tons ODS (2,700 tons ODP).		1. By the end of 2000 2. By the end of 2001
3. Notice on banning newly-built enterprises which produce or use ODS	1. Promotional campaign, through various channels; 2. Joint supervision of Notice by local Electronic Bureaus and EPBs.		
4. Notice: Foreign enterprises should phaseout ODS solvent by own resources.	Promotion campaign and monitoring		From July 2000
5. Controlling import and export of ODS solvent	1. Import and export of CFC-113, TCA and CTC will be controlled in 2000; 2. Import and Export of CFC-113 and CTC will be banned in 2001; 3. Export of TCA will be banned in 2001.		1. By July 1, 2000 2. By January 1, 2001 3. By January 1, 2001
TECHNICAL ASSISTANCE ACTIVITIES			
ACTIVITIES	MLF requested (US\$'000)	funding	Actions Required
			Key Dates

a. MIS development	50	MIS center will be located in PMO, with substations in MII and DIA	1. Start preparation in June 2000. 2. Operational at end 2000.
b. Public Awareness	70	Promote public awareness of enterprises on ODS solvent sector phaseout activities	Start no later than July 2000
c. Training	90	Training on supervision of ODS solvent consumption and operating manual.	Start no later than July 2000
d. Strengthening ATSS	170		Start in June 2000
e. Establishment of third technology center	200		Start in September 2000
f. Preparation for the development of a non-ODS solvent management plan	300	1. Preparation of a report on experiences from developed countries. 2. Determine essential and necessary usage in the solvent sector	Start no later than September 2000
g. Establishment of standards and technical norms	250	By qualified institution	Start no later than October 2000
h. National and International Consultants	70		Start no later than July 2000
Total for TA Activities in 2000 - 2001	1,200		

H. Development and Investment of Alternative Solvents Production

The potential candidates of alternatives to be developed include n-propyl bromide (nPB), hydrate-carbon, HFCs, etc. Based on cleaning test and market analysis conducted in China so far, there are several non-ODS solvents produced locally that could be used to replace CFC-113 and TCA in industrial production as alternative solvent, such as HEP-2 (including nPB) and HT-1 (including hydrate-carbon), but the supply of these alternative solvents is still at low quantity and higher price. It is therefore important to support the development and local production of these alternative solvents so as to have sufficient supply at lower price to reduce the cost of phaseout actions and make the implementation of Solvent Sector Plan more successfully and smoothly. All ODS consumers will be encouraged to take part in the phaseout actions more actively and can therefore benefit from this support. The implementation of development of alternative solvents will follow the Guideline for management of investment on ODS substitute production which is being developed.

Two locally developed alternative solvents, HEP-2 (including nPB) and HT-1 have been evaluated by Chinese industries and found to be economically and technically acceptable alternative solvents. Testing and pilot production in some sub-sectors have proven to be effective and their use being accepted by those enterprises. HEP-2 is a chemical mixture, its main component is nPB (60-70%) and 3

other non-ODS, non-toxic chemicals. Its physical property is quite similar to TCA and can be used for cleaning instead of CFC-113 and TCA in many applications, such as LCD and metal cleaning. At present, HEP-2 is imported from USA at 1.5 to 2 times the price of CFC-113. As HEP-2 is produced and used in America and its cleaning property has been proven by testing and pilot production in China, SEPA has provided to the enterprises as one of the alternative solvents to be used in preparing for the first year bidding.

HT-1 is a locally produced co-solvent. Its main component is hydrate-carbon. Its has zero ODP and has no toxicity. HT-1 was used safely for several years in aviation industry in China. It cannot be used widely as CFC-113 and TCA, but it can be used as one alternative option for ODS phaseout in some sub-sectors and enterprises.

While China understands that nPB is a low ODP substance and that the Scientific Assessment Panel and the TEAP are evaluating nPB and will draft new report regarding its ODP value and toxicity, China will abide by the decisions made by the Parties and the Executive Committee regarding its usage.

Realizing the importance and necessity of developing local alternative solvents to provide sufficient good quality at reasonable price to enterprises that will undertake ODS phaseout activities, China will support the local development and production of HEP-2 and HT-1. If a winning enterprise chooses to use HEP-2 as an alternative solvent, China will approve its usage in the appropriate applications. China will ensure that the decision of the Parties and the Executive Committee regarding the usage of these alternative solvents will be strictly followed.

Table 4 Implementation Programme – Development and Production of Alternatives

ACTIVITIES	MLF funding requested (US\$'000)	Actions Required	
Development and Investment on Alternative solvents production	1,250 (2000) 750 (2001)	1. Selected alternative(s) to be developed; 2. Selected enterprise(s) through bidding process to develop alternative production.	1. By June 30, 2001 2. By December 31, 2001

Table 5 Implementation Programme (2000 - 2001)

Performance Indicators

Solvent Phaseout Targets				
Solvent sub-sector	Start of programme (MT)	Reduction Target (MT)	End of programme (MT)	Indicators to be reported on in semi-annual progress reports. Verified in annual performance audits
CFC-113 Imports/exports	149	149	0	<ul style="list-style-type: none"> Ban on exports and imports effective January 1, 2001
Domestic consumption and phaseout target	4,441	466 (plus 600 from on-going MLF projects)	3,375 (in 2001) 2750 (in 2002)	<ul style="list-style-type: none"> Consumption levels (production plus imports minus exports)
TCA	-	>100	-	<ul style="list-style-type: none"> Included in ODS Reduction Contracts
Number of ODS Reduction Contracts (inclusive of TCA supplement) Voucher Redeem		L/M 20-40 S 100 (2001)		<ul style="list-style-type: none"> Number of contract signed (sum of ODS reduction in the contracts) Progress under contracts Number of voucher redeemed
Development and Investment on alternative solvents production				<ul style="list-style-type: none"> Strategy developed and potential alternatives to be developed selected by June 30, 2001 Enterprises selected for investment through bidding process.
Policy and TA Initiatives				
Initiatives	Indicators to be reported on in semi-annual progress reports			
1. Bidding system	<ul style="list-style-type: none"> Bidding system's operating procedures finalized Winning enterprises for 2000 – 2001 selected Enterprises trained for bid preparation for 2000 and 2001 bidding 			
2. Public Awareness	<ul style="list-style-type: none"> Introduce Solvent Sector Plan and phaseout schedule on two newspapers Invite ODS solvent users to take part in the reduction bidding and promote the enterprises to participate in the phaseout actions 			
3. Training	<ul style="list-style-type: none"> Provide personal training courses to ODS users, EPBs and local line ministries 			
4. Notice on banning newly-built enterprise which produces or uses ODS solvent	<ul style="list-style-type: none"> Promotional campaigns on the ban; Local Electronic Bureaus and EPBs engaged in overseeing ban enforcement. 			
5. Developing ATSS	<ul style="list-style-type: none"> Contracts issued, progress reports 			
6. Establishment of standards and technical norms	<ul style="list-style-type: none"> Contracts issued, progress reports 			