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Addendum

COUNTRY PROGRAMME: CHINA

This document includes:

- (a) Evaluation Sheet (prepared by the Fund Secretariat); and
- (b) Country Programme Cover Sheet (prepared by the Fund Secretariat)

CHINA COUNTRY PROGRAMME EVALUATION SHEET

The China Country Programme is submitted to the Ninth Meeting of the Executive Committee as document UNEP/OzL.Pro/ExCom/9/13. The document was prepared in accordance with the "Procedures for Presentation of Country Programmes and Project Proposals to the Executive Committee" (UNEP/OzL.Pro/ExCom/5/5/Rev.2).

This submission consists of:

- Letter of Transmittal from the Government of China;
- Country Programme Cover Sheet (prepared by the Secretariat);
- Country Programme document, which includes:
 - Introduction;
 - ODS production and consumption;
 - Government strategy;
 - ODS phase-out process;
 - Institutional framework;
 - Policy framework (Action plan attached);
 - Incremental costs for ODS phase-out (Project list attached).

The document did not include an executive summary, hence a more detailed evaluation sheet has been prepared.

Introduction

The Country Programme was prepared with significant financial input and manpower from the Government of China. The policies, strategies and actions in the Country Programme were based on consensus developed through national workshops and sectoral working groups and supported at the highest level of Government, the State Council of China. Thus, not only does the Country Programme reduce a complex undertaking to a logical, well structured and methodical process but more importantly it provides a very credible blueprint for phase-out in China.

Characteristics of the Country Programme

The following are some of the characteristic features of the Country Programme:

- Results reported in the document are based on real data appraised on the basis of their effectiveness and applicability to China, rather than on theoretical assumptions.
- The incremental cost components of all the projects which have been specified by sector have been costed at the enterprise level based on the Indicative List

of Categories of Incremental Costs and incremental cost templates prepared by the Secretariat. The unit phase-out costs for each sector have also been determined. This gives a more realistic picture of the cost to the Multilateral Fund of the ODS phase-out in China.

- A detailed list of projects based on the above evaluation procedures have been compiled including technical assistance component as an annex to the document. (This was not submitted with the Country Programme.)
- A three-phase schedule for developing and initiating the projects (in batches) has been determined on the basis of viability of substitute technology and in line with the adopted phase-out strategy.
- Net incremental phase-out costs have been determined to the year 2010. Thus while the year 2010 phase-out scenario is adopted and the total net incremental project costs to the year 2010 are expected to be nearly US \$1,432 million, the net incremental project costs to any year can be determined from the table provided (Table 11, page 48). For example, the net incremental costs to the years 1996 and 2000 can be determined as US \$428.37 million and US \$939.66 million respectively.
- Costs of premature retirement of domestic refrigerators and refrigeration and air-conditioning equipment, the conversion of commercial refrigeration equipment and the recovery and disposal of the shells of refrigerators and cold cabinets have been identified as one of the significant costs of phasing out CFCs in the domestic refrigeration sector. However, these costs have not been included in the Country Programme since it is difficult to calculate them accurately due to unclear technical and financial guidelines available at present.
- The implementation of the Country Programme is fully integrated into the economic planning and political decision-making processes at the highest level of government, as well as the research and development infrastructure.
- Responsibilities under the Country Programme are clearly defined. Recognizing the dynamic nature of the development of ODS phase-out technologies, a higher institution of excellence (Peking University) has been entrusted with periodic revision of the Country Programme.

Production of ODS and ODS Consuming Products (1991)

There is an extensive production infrastructure. The following table provides information on production of ODS and ODS containing products:

Sector	N° of Enterprises ¹	Output Tonnes ²	ODS Consumed Tonnes ²
ODS excluding Halons	40	25,000	-
Flexible polyurethane foam	30-40	50,000	2,000
Extruded polyolefin foam	30	13,000	2,173
Rigid polyurethane foam: Pipeline insulation Foam boards for refrigerators	10 100	NA 5-7 million refrigerators & cabinets	600 5,000 ³
Industrial/Commercial refrigerators	300		11,371 ⁴
Domestic refrigerators	70	5-7 million refrigerators/ cabinets	1,050 ⁴
Halon-1211	30	6,000 ⁵	
Halon-1301	1	100 ⁵	
Extinguishers	80	1-2 million units	2,645
Stationary Extinguishing systems	25	4,600 units ⁵	3,550
Aerosol	100		8,600
Electronic Enterprises	3,200		4,947

¹ In several cases the actual figures are reported to be exceeding the stated quantities.

² Tonnes, unless otherwise stated.

³ Another 8,000 tonnes were used to produce boards for cold storage.

⁴ CFCs as refrigerants.

⁵ Installed capacity.

ODS Consumption

China's ODS consumption in 1991 was 48,239 metric tonnes (60,352 weighted tonnes or 0.05 kg. per capita), of which 63 per cent was produced domestically and 37 per cent was imported. The weighted consumption of China is distributed as follows: the largest sector was foams at 29 per cent, followed by halons at 28 per cent, then refrigeration/air-conditioning at 21 per cent, then solvents at 10 per cent, and finally aerosols at 7 per cent.

China imported 17,100 metric tonnes of CFCs, 300 metric tonnes of methylchloroform and 540 metric tonnes of halons in 1991 to make up for the balance of consumption in the country. China exports a small amount of CFCs, perhaps 100-200 metric tonnes a year.

Government Strategy & ODS Phase-out Process

The Government will adhere to the provisions under the London Amendment and Adjustments of the Montreal Protocol. Therefore, on the basis of, and subject to, the limitations of technical and economic feasibility, the complete phase-out of ODS will be attained by the year 2010. This will be achieved through step-wise phase-down approach which aims at the following targets:

- 12 per cent phase-out by 1996.
- 61 per cent phase-out by 2000.
- 79 per cent phase-out by 2105.
- 100 per cent phase-out by 2010.

The fastest phase-out would be in aerosols with ODS consumption in the year 2000 being only 8 per cent of that of 1991, and it will be completely phased out by 2005. Halon consumption in year 2000 would be only 23 per cent of that of 1991. Consumption of solvents, both CFC-113 and methylchloroform, would increase in 1996 but by year 2000 would come down to 1991 levels and will then rapidly decrease to achieve complete phase-out by the year 2010.

Early obsolescence of equipment containing or using ODS will be a major cost (and difficulty) of the CFC phase-out process in China, and extraordinary measures will be needed to minimize this early equipment retirement cost. China's strategy to significantly reduce this cost will be achieved through using the transitional HCFCs to phase out CFCs, thereby extending the life of installed equipment across the country while simultaneously reducing ODP.

The Country Programme does not however consider the phase-out of HCFCs as the related technologies have not been clarified so far. In the future, with development in related technologies, the Country Programme will be revised to cover such issues.

In order to ensure the effective implementation of the Country Programme the Government has established an institutional framework which provides active government oversight and defines the responsibilities of ministries and government agencies.

Policy Framework

Nine specific policies have been, or are being, developed to phase out ODS use and to encourage the introduction and use of substitute technologies. These include:

- Policy for Production Management: the permit and quota system would be used for ODS production.
- Import Policy: the import of controlled substances and their products would be restricted when needed.
- Sales Policy: the Government will become the exclusive supplier for sales of ODS and will manage this sales programme.
- Taxation Policy: applicable tax rates for controlled substances and their

productions will be increased when appropriate. Preferential tax rates will apply to products manufactured using ODS substitutes.

- Investment Policy: the Government will encourage investment policies that help ozone layer protection.
- Incentive Policy: a special fund would be established to encourage organizations and individuals who have made or could make outstanding contributions to the phase-out of controlled substances.
- Public Awareness Policy: public awareness on the importance of ozone layer protection will be raised through extensive use of the public media. Training courses will also be organized for technicians and managers.
- Green Label Policy: the Government will design a system to issue "green labels" for products manufactured using either ODS substitutes or that are completely free of ODS.
- Legal Policy: laws and regulations for the management of controlled substances.

Incremental Costs for ODS phase-out

The estimated net incremental cost for ODS phase-out projects by the year 2010 is US \$1,432 million. The breakdown is as in the table below:

Sector	US \$ x 1,000*
Aerosols	8,400
Foams	344,300
Refrigeration comprising:	
(a) domestic refrigeration	224,490
(b) industrial/commercial refrigeration	242,760
Solvents	65,780
Halons	195,140
Recycling & Recovery	30,620
Chemical Industry (production of substitutes)	320,340
TOTAL	1,431,830

* 1992 constant prices.

The total net incremental cost to be sought from the Multilateral Fund is however US \$2.103 billion which includes the above amount for projects, US \$661.8 million as incremental costs to users for servicing and refilling refrigeration equipment with substitute refrigerants and US \$9.5 million as state administrative costs.

The issue of state administrative costs is a new element which poses a question of potential double counting, considering that funds are provided for non-ODS phase-out projects such as institutional support at the national and sectoral or project level, and administrative costs are built into individual projects.

Factors Influencing the Implementation of the Country Programme.

The Country Programme puts into sharp focus certain factors that are likely to influence the pace of the phase-out in China. Among these are:

- The steady growth of the economy which dictates the rate of growth of ODS consumption. The GNP grew by 7 per cent between 1990 and 1991 while total industrial output grew by 14.2 per cent in the same period. Not surprisingly, the total ODP weighted unconstrained demand of 2010 will be 529 per cent higher than 1990.
- There will correspondingly be rapid growth in manufactured products in all the sectors in the short term ranging between 8 per cent for foams, 20 per cent for MACs and 30 per cent for Halon-1301. In the long term 1996/97 to the end of phase-out period will slow down to 3 per cent for foams to 11-16 per cent in the solvent sector and 15 per cent for commercial refrigeration equipment.
- CFC production is significant with 40 production facilities having total installed capacity of 47,000 tonnes. Twelve of the production plants are large (state-owned enterprises) and the rest smaller collectively owned. There is significant under utilization of capacity. Capacity utilization in the two categories of enterprises is 62 per cent and 43 per cent respectively.
- Production is based on indigenous technology using local raw materials. Since most production facilities have been locally designed for specific products, the flexibility to convert from CFCs to substitutes in the production process may not be feasible.
- On-going research and development activities in ODS substitutes and substitute technologies could also influence the choice of substitutes and substitute technologies. The following activities indicated in the Country Programme could be pertinent in this regard:
 - Synthesis of HFC-134a has been completed and tested.
 - Experiments on HFC-152a and binary operating media of HCFC-22/HCFC-142b and HCFC-22/HFC-152a blends for use in refrigerators have been carried out.
 - A dry powder KCL extinguishant and water-based extinguishants have been developed.

- Water cleaning and substitute cleaning methods have been tested on parts of electronic guns and printed circuit boards (PCBs).
- Although China is the largest producer of the Article 5 countries only 0.4-0.8 per cent of the output is exported, while 40 per cent of the local demand is imported (mainly from Japan, France and USA).
- There is extensive infrastructure for the production of products using ODS. One notable aspect is the involvement of small township and village enterprises (TVEs) in production which is significant in some sectors but not clearly determined. Another aspect is the use of old technologies in some sectors such as industrial refrigeration.

SECRETARIAT'S RECOMMENDATIONS

The completion and eventual approval of the China Country Programme will be an important landmark in the effort to phase-out ODS in Article 5 countries, China being the largest Article 5 ODS consumer as well as producer. Thus the Secretariat recommends as follows:

1. To take note with appreciation the submission by the Government of China of the Country Programme and the effort of the Government and the implementing agencies which assisted in the preparation of the document, for producing a document of high quality.
2. To approve the Country Programme. The approval of the Country Programme does not denote prior approval of funding levels contained in the Country Programme.

COUNTRY PROGRAMME COVER SHEET

COUNTRY: CHINA

LEAD NATIONAL AGENCY: NATIONAL ENVIRONMENTAL PROTECTION AGENCY (NEPA)

LEAD IMPLEMENTING AGENCY: UNDP

DATE RECEIVED: 6 February 1993

1. Phase-Out Schedule

Substances	Current Calculated Consumption (tonnes x ODP) 1991	Planned Total Consumption until phase-out (tonnes x ODP)	Planned year of complete phase-out
CFC-11	16,230 x 1.0 = 16,230	145,783	2010
CFC-12 ¹	23,012 x 1.0 = 23,012	252,056	2010
CFC-113	3,661 x 1.07 = 3,917	60,996	2010
MCF ²	1,037 x 0.12 = 124	1,959	2010
CTC ³	249 x 1.08 = 269	3,769	2010
Halon 1211	4,000 x 4.0 = 16,000	117,040	2010
Halon 1301	50 x 16.0 = 800	9,760	2010
Total	48,239 = 60,352	591,362	

¹ CFC use in aerosols should decline from 8,600 metric tonnes in 1991 to 680 metric tonnes in the year 2000 leaving only essential uses and to zero in the year 2005.

² MCF = Methylchloroform

³ Carbontetrachloride