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EXECUTIVE COMMITTEE OF
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**Strategy Plan of ODS phase-out from Production of Extruded Polyethylene and
Polystyrene Foams Sub-Sector of China**

(Submitted by UNIDO)

Part I: Comments from the Fund Secretariat

**Part II: Strategy Plan of ODS phase-out from Production of Extruded Polyethylene
and Polystyrene Foams Sub-Sector of China**

Part I

Comments from the Fund Secretariat

Background

1. In Decision 25/34, the Executive Committee requested the Government of China, in co-operation with the relevant implementing agencies, to prepare a sectoral strategy plan for the polyethylene/polystyrene foam sub-sector, and that approval of future projects in the sub-sector would be dependent on the preparation of such a plan.
2. UNIDO submitted the strategy to the 28th Meeting of the Executive Committee on behalf of the Government of China.
3. In Decision 28/45 the Executive Committee requested UNIDO to refine the strategy plan for ODS phase-out from production of the extruded polyethylene and polystyrene foam sub-sectors of China, and resubmit it to the Executive Committee. In the revised strategy, the total capacity of the enterprises for which funding for conversion would be sought would correspond to the existing level of production of the sub-sector indicated in the strategy, including those projects already approved.

Discussion

4. As indicated to the Committee at its 28th Meeting, the document submitted by UNIDO is not a sector phase-out plan like the plan for the halon sector in China, in which a level of funding was agreed by the Executive Committee and the Government of China guaranteed to complete the phase out of halons in a specific time-frame. Rather, this strategy document provides an overview of the polyethylene/polystyrene (PE/PS) foam sub-sectors in China, an indication of the project groups likely to be prepared and submitted for funding, the proposed timescale for phase-out activities and an explanation of the policy and institutional support measures proposed to be adopted. It is predicated upon the submission of group and umbrella projects. The capacity of the enterprises proposed to be funded for conversion is less than the current total capacity.

Compliance with Decision 28/46

5. For the polyethylene (PE) sub-sector, projects already approved by the Executive Committee have provided funding for the conversion of forty-six production lines in 25 enterprises. Of the remaining 130 production lines in 75 factories, the strategy proposes that “it will be sufficient to have 48 to 50 extrusion lines to maintain the current production capacity of the group of factories.” It is proposed that the 48 to 50 production lines be converted in a single terminal umbrella project. Although much information is provided about installed production capacities and consumption of the enterprises, it has not been possible for the Secretariat to confirm from this information whether the total capacity proposed for conversion (including projects already funded) is equal to the total existing level of production, or whether it exceeds, or is less than, the existing level.

6. For the polystyrene (PS) sub-sector, individual projects already approved will convert 18 enterprises. This leaves a total of 82 production lines in 55 enterprises, all of which are said to have been in operation before 1995. It is proposed in the strategy to convert all 36 production lines in 22 enterprises in a group project, then to convert all 34 lines in a further 21 enterprises in a second group project. Finally, it is proposed to fund the conversion of 10 of the remaining 12 production lines (one line per enterprise) in the same terminal umbrella project used for the PE sub-sector above. For the PS sub-sector overall, funding will not be sought for a total of two lines in two factories. Again, despite the extent of information provided in the strategy document, it has not been possible for the Secretariat to confirm from the nature of the data, the relationship between the installed production capacity of the enterprises to be converted with the total existing level of production in all the enterprises, including those already approved.

Funding

7. On the basis of the proposals in the strategy, the total cost of the PE/PS sub-sector phase out will be US \$36.8 million. Of this amount, US \$17.5 million has been allocated to projects already approved, US \$9.8 million for the PE sub-sector and US \$7.7 million for the PS sub-sector. Proposed costs for the remaining projects covered in the strategy total US \$3.3 million for the PE sub-sector and US \$16 million for the PS sub-sector.

Cost effectiveness and eligibility

8. The single terminal umbrella project which is proposed to be used to complete conversion of the final group of enterprises in both the PE and PS sub-sectors will have a cost effectiveness of around US \$8.00/kg, approaching the threshold of US \$8.23/kg.

9. The two approved group projects in the PE sub-sector have cost-effectiveness figures of US \$3.92/kg and US \$6.43/kg respectively. The cost-effectiveness of each of the two group projects in the PS sub-sector is foreshadowed to be US \$5.2/kg. This can be compared to a weighted average cost effectiveness of US \$4.6/kg for the 18 PS projects already approved.

10. The decreased cost effectiveness of the projects proposed in the strategy may be influenced by the fact that the first projects were generally for enterprises with larger levels of ODS consumption. The projects have savings arising from the lower cost of the hydrocarbon blowing agent. These savings have a greater impact on large projects

11. However the decreased cost effectiveness of the terminal umbrella project arises in large part from the proposal in part 5.3 of the strategy document that incremental operating savings should not be applied to the final terminal umbrella project. It is suggested in part 5.3 that the terminal umbrella project has been formulated according to Decision 25/50, part (d) of which referred to “a new approach for small or informal enterprises”, in which incremental operating costs or savings will not be included in project costs. Citing Decision 25/50, it is also proposed in the strategy that US \$250,000 be included in the terminal umbrella project for institutional support activities.

12. The Fund Secretariat understands that the proposition for a new approach, later adopted as Decision 25/50 was formulated to take account of difficulties faced by very small enterprises

predominantly in the informal sector which had minimal levels of equipment in the baseline and for which it was very difficult to establish the consumption (because the enterprises engaged in a variety of different activities involving both manufacturing assembling and servicing). Such enterprises would be unlikely to have either high incremental operating costs or savings. These characteristics do not apply to the enterprises involved in the manufacture of PE/PS foam products in China, and the Committee might consider the extent to which Decision 25/50 can be applied to this sub-sector and used in the strategy. If Decision 25/50 is found not to apply, the terminal umbrella project will need to be revised to take account of incremental operating savings, which can be up to 30 percent of the project cost

13. Finally, it is pointed out in the strategy that implementation of the proposed industrial rationalisation will lead to unavoidable additional conversion costs which are “not foreseen by the existing rules of the Multilateral Fund” and that it will be necessary in the future to seek the additional guidance of the Executive Committee. The implementing agency might be asked to clarify on behalf of the Government of China whether implementation of the activities in the strategy is proposed to be conditional upon some future additional activity by the Executive Committee.

Conclusion

14. The Executive Committee might consider what further guidance it may wish to give to UNIDO regarding compliance with Decision 28/45. The Committee might also wish to re-emphasise the intent of Decision 25/50 paragraph (d) which was directed towards the disorganised or informal sector.

Part II

**State Environment Protection Administration
the People's Republic of China**

**Strategy Plan of ODS phase-out from Production of
Extruded Polyethylene and Polystyrene Foams
Sub-sector of China**

**29th meeting of the Executive committee of the Multilateral Fund for the
Implementation of the Montreal Protocol**

Beijing 1999

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INTRODUCTION

The Strategy Plan is prepared by the State Environmental Protection Administration of China in cooperation with the State Light Industry Bureau and other national agencies concerned as well as with the relevant implementing agencies in accordance with the Decisions 25/34 and 28/46 of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol.

The overall concept of the document was elaborated in line with the recommendations and guidance of the Decision 25/50.

1. BACKGROUND

The Chinese government has approved the "China Country Programme for Phase out of Ozone Depleting Substances (ODS)" in 1993, which marked the beginning of the government's actions on phasing out of ODS by using the grants from the Multilateral Fund. In order to reflect the main tendencies and to provide the actual information and data on the production, application and phase-out of the ODSs by the different industrial sectors of the country within the period of 1993-1997 and to highlight the future strategy plan of action for the complete ODSs phase-out, the Country Programme was updated in 1998, which is presently under the consideration and approval of the State Council prior to the official submission to the Ozone Secretariat. As for the sector of the expanded polymer foams is concerned, the ODS Project Management Office of SEPA and the China Plastics Industry Association have established a specialized working group (SWG) with the task to carry out an "in depth inventory" of the sector and its sub-sectors and to assist SEPA and the implementing agencies to elaborate the relevant integrated sectoral and sub-sectoral strategy plan and a work programmes for the ODSs phase-out.

The Chinese foam industry consumed 23,900 tons CFCs in 1997 (China Country Programme, 1998). CFC-11 was the dominant substance (17,300t), followed by CFC-12 (6,660 t). Production is divided between larger state-owned enterprises and smaller township or private enterprises. Production and process information from state enterprises is well documented. However, information on the rest of the industry is less reliable. More detailed information about the sector is provided in the following table:

Table 1. Production of Foam and Consumption of ODSs in 1997

CATEGORIES	ODS (T)	PRODUCTION (T)
Extruded PS/PE	6,660	50,000
Flexible Polyurethane	6,340	140,000
Rigid Polyurethane	10,960	70,000
TOTAL	23,960	260,000

The State Environmental Protection Administration and the State Light Industry Bureau are agencies coordinating ODS phase out in foam industry. They plan to phase out the use of ODS in extruded PS/PE by 2004 and phase out the use of ODS in polyurethane by 2010.

Table 2, 3 and 4 show total amount of ODS phase out target of approved MLF projects and net ODS consumption left in the foam sector. China's Ozone Leading Group provided the following information, which was presented in the Country Program Update (prepared end-1998).

Table 2. ODS Phase-out Target of Approved Projects
(including approval by the 28th Excom, July 1999)

Sub-sector	ODS type	Number of Enterprises	Phase-out target MT	Fund approved
PE	CFC-12	59	2,661.7	12,344,237
PS		18	2,440.0	7,680,667
PU Flexible	CFC-11	35	3,316.1	13,969,305
PU Rigid		34	2,914.4	1,894,836

Table 3. Net ODS Consumption left in the Foam Sector
(including approval by the 28th Excom, July 1999)

CFCs	1997 Consumption ¹	Phase out Target of Approved Projects ²	Project Impact by the end of 1996 ³	Net ODS Consumption Left in the Foam Sector ⁴
CFC-12	6,661.0	5,201.7	1,800.0	3,259.3
CFC-11	17,303.0	7,685.0	1,034.0	10,652.0
Subtotal	23,964.0	12,886.7	2,834.0	13,911.3

1. Data collected from Country Program Update (23,964 has already included project impact of 2,834 tons);

2. Data collected from projects up to 27th ExCom;

3. Data collected from projects claimed completed by government;

4. Net consumption of ODS for new MLF projects=23,964 – (12,886.7– 2,834).

Table 4. Breakdown of ODS consumption by remaining enterprises

Sub-sector	ODS type	Remaining enterprises	Remaining ODS consumption, Mt
PE	CFC-12	75	409.3
PS		55	285.0
PU flexible	CFC-11	700 (approx.)	4,519.2
PU rigid		600 (approx.)	6,132.8

2. DESCRIPTION OF THE PE/PS FOAMS SUB-SECTORS

Although in the Decision 25/34 the polystyrene/polyethylene sub-sectors are defined as one sub-sector, on practice the sub-sector is operating as two different sub-sectors: extruded polyethylene (EPE) and extruded polystyrene (EPS) foams due to the following reasons:

- different design of extruders, (different design of screws and extrusion dies) and therefore different cost of retrofitting;
- different outputs (capacities) of extruders and CFC-12 consumption (much higher at the EPS foams factories);
- different products, applications and market:
 - EPS insulation boards for construction and sheets for food packaging;
 - EPE packaging nets for the agricultural products;
- different government policy and regulations for agro-related and other sectors of economy.

Therefore at the actual conditions of China, the Government strategy has been prepared with the concept to address the sub-sectors separately by the individual group projects. However the terminal umbrella project will cover all the remaining factories of both sub-sectors as it was recommended by the 28th meeting of the Excom.

2.1. Sub-sector of the EPE packaging nets manufacture

The sub-sector is mainly dealing with manufacture of the PE packaging nets for the agricultural products as well as for fragile industrial products. Therefore the factories are located in the countryside in different provinces in order to be closer to the customers. The total number of enterprises operating in this sub-sector is 204, including 70 factories established after July 1995 with average CFC-12 consumption during 1996-1998 of 50 Mt which are not covered by the Strategy Plan for the financial assistance of the Multilateral Fund. 7 factories have been converted before 1998 under the MLF projects: 52 factories are being converted under two recently approved group projects (see Tabel 2), 75 factories are subject for conversion under proposed terminal EPE/EPS umbrella project. The EPE factories are mainly equipped with three types of the single screw extruders with the foam output of 25 kg/h, 14 kg/h, and 10 ÷ 12 kg/h respectively.

Due to the specifics of the market requirements for the packaging nets, the current production practice is organized accordingly to utilize the installed production capacities to the most possible extend.

2.2. Sub-sector of the EPS packaging sheets and insulation boards manufacture

The sub-sector is mainly dealing with manufacture of the PS sheets for subsequent thermofoaming for application of fresh and “fast” food packaging as well as with production of PS insulation boards for application in construction as well as for other industrial and domestic insulation applications. The total number of the enterprises operating in this sub-sector is 73 and all of them have been established in the period 1992 - 1994; there are no new factories established after July

1995. 18 factories have been converted before 1998 under the MLF projects (see Table 2), 55 factories are proposed for conversion under two group projects and the Terminal EPE/EPS umbrella project.

The factories are located in the industrial zones of the country and are equipped with the single screw extrusion lines (imported and locally made) with output of 50 kg/h. Most of the factories are equipped with two extrusion lines in order to have the necessary flexibility of the production programme and to meet the market demands.

The updated CFC-12 consumption data by the EPE/EPS sub-sector are summarized in Table 5.

Note: consumption of CFC-12 by these sub-sector did not grow after year 1997. Therefore the baseline data used for the Strategy Plan is 6.661 Mt ODP for 1997 and 1998 only. For year 1999, only CFC-12 consumption not covered and carry overed from 1998 was used for the calculation.

Table 5

Consumption of CFC-12 by the EPE/EPS section

Sub-sector	Project target approved end of 1996 Mt	Actual consumption in 1997 Mt	Project target approved by end 1997 and on-going projects from 1996Mt	Remaining project target for submission in 1998 and future	Project target approved in 1998-July 1999	Remaining project target for submission after July 1999
1	2	3	4	5	6	7
EPE	400	2,621	240 (+400 Mt of 1996)	2,381	1,971.7	409,3
EPS	1,400	4,040	1,190 (+1,400 Mt of 1996)	2,850	-	2,850
Total	1,800	6,661	3,230	5,231	1,971.7	3,259.3

Legend for Table 1.

2. *Indicate CFC-12 consumption of the various projects approved at the end of 1996 and planned to be completed at the end of 1997. Since in 1997 these factories will continue the usage of CFC-12, the amount of 1,800 Mt of CFC-12 is considered as a part of the ongoing projects of 1997 (column 4);*
3. *Indicates CFC-12 consumption by the sub-sectors based on the Country Programme up-date (1998);*
4. *Indicates the projects' target approved during 1997 and planned to be completed end 1998 (1,430 Mt) and the ongoing projects' target approved end of 1996 (1,800 Mt) and planned to be completed in 1997;*

5. *Indicates the difference between the actual CFC-12 consumption figure (6,661 Mt) in 1998 equal to 1997 and the ongoing projects' target approved in 1997 (1,430 Mt) and planned to be completed by end of 1998;*
6. *Indicates projects' target approved during 1998 until July 1998 (including 28th meeting of the Excom);*
7. *Indicates the potential projects' target for submission after July 1999 (column 5 - column 6 =column 7)*

3. METHODOLOGY AND CRITERIA FOR SELECTION OF ENTERPRISES

- 3.1 On the request and guidance of SEPA, the China Plastic Industry Association had carried out an in-depth inventory exercise of the EPE and EPS sub-sectors in 1996-1997 and the complete list of the enterprises operating in these sub-sector was prepared.
- 3.2 Under the overall coordination of SEPA, the inventory list of EPE/EPS enterprises was reviewed by the implementing agencies in cooperation with SEPA consultants and the priority lists of factories as candidates for the projects were established.
- 3.3 The preselected factories are requested to fill in a relevant questionnaire to be submitted to SEPA for the evaluation. Preselected factories should, inter alia, to provide the following information:
 - date of establishment;
 - ownership status;
 - breakdown of CFC-12 and other chemicals consumption for the last three years;
 - describe the baseline equipment, names of the original manufacturers and year of purchase;
 - describe the current production programme and the market opportunities;
 - made statements about stability and financial capacity and readiness for the eventual cost-sharing of the conversion etc.
- 3.4 Based on the submitted questionnaire, a tentative list of the enterprises - candidates for the individual or group projects is being established and SEPA, on behalf of the Government, is taking decision regarding the projects distribution among the implementing agencies.
- 3.5 The project(s) formulation starts from a visit of the national or international consultant(s) to the selected enterprises in order to verify the main data and information of the questionnaire and to collect the additional information required for the project(s) formulation. The enterprises have to present the evidence documents to confirm (prove) the information provided in their questionnaire. In case the presented documents are not sufficient or incomplete, an enterprise - candidate might be temporarily excluded from the short list.

- 3.6. The consultants are obliged to brief the selected enterprises about the advantages and disadvantages of the available alternative technology options, basic rules and regulations of the Multilateral Fund as well as the relevant implementation procedures and the national environmental policies and legislation.
- 3.7. The project documents, prepared by the implementing agencies in line with the respective format, criteria, rules and regulations as well as the relevant Decisions of the Excom are subject for SEPA endorsement prior submission to the MLF Secretariat.

4. SELECTION OF ALTERNATIVE BLOWING TECHNOLOGY

There are several options to replace CFC-12 in the production of EPE foam, such as:

- Atmospheric gases and their blends
- Hydrocarbons, including LPG
- HCFCs
- HFCs
- CO₂/butane blend

Atmospheric gases and their blends

Nitrogen gas is inert, non-toxic and non-combustible, but asphyxiant . The use is becomes difficult because of its low solubility in the polymer and the increase in mix viscosity which may be too high from any extrudes. The final products have a relatively high density. New polymer developments may make the use of nitrogen a more viable option in the future.

Berstorff Technology is based on a mixture of nitrogen and alcohol. This technology exhibits undefined risks in toxicity and fire. The resulting product has also a high density.

Carbon dioxide gas is an asphyxiate, high energy consuming and moderately toxic gas. Carbon dioxide as con-agent is a proven technology. The process using CO₂ alone in EPE foam net production is patented and therefore require licensing. Further, carbon dioxide diffusion rates are also too fast to avoid massive shrinkage. It is viable for higher density foams and therefore is not suitable for the current application.

Hydrocarbons including LPG

N-pentane, butane, isopentane, isobutane and their mixtures are proven replacements to CFCs. The technology is cost effective and results in a product of acceptable quality. However, the flammability of hydrocarbons can cause a problem both in the manufacturing processes. Stringent safety precautions in the manufacturing processes are required.

Liquefied petroleum gas (LPG) has also been proposed as replacement for CFC-12 in polyethylene (PE), polypropylene (PP) and polystyrene (PS) foam industry. LPG is however toxic, flammable and not generally accepted for food packaging. If LPG is to be used, it should be purified/deodorized by using molecular sieves and a buffer agent for boiling point stabilization should be added.

Hydro chlorofluorocarbons (HCFCs)

HCFC-22 is non-flammable, low in toxicity, thermally and chemically stable, and has been proven effective. This substance has however an ozone depleting potential (ODP), and only qualifies as an interim replacement HCFC-142b can be used alone or in combination with HCFC-22 to reduce

the flammability. The price penalty is however considerable and equipment has to be modified to cope with the moderately flammable substance and the modified diffusivity of the compound.

Hydro fluorocarbons (HFCs)

HFC-134a is non-flammable, low in toxicity and has zero ODP. The current high pricing will prevent utilization in the very cost sensitive food serving and packaging applications. The utilization of HFC-134a in foam competes with the utilization as a refrigerant in appliances and automotive air conditioners. HFC-152a is low in toxicity, moderately flammable and possesses zero ODP. It has rather high cost and its flammable nature requires modification of production equipment.

All the enterprises of the EPE and EPS sub-sectors to be covered by this document have selected to use butane to replace CFC-12 in the conversion.

Reasons for the selection are:

- Proven technology in processing and product performance
- Environmentally acceptable
- Acceptable toxicity
- Adaptable to the existing equipment
- Cost-effective
- Available in China in bulk delivery.

Safety Concept

In accordance with the common practice and standard for conversion and operation at the EPE/EPS plants using a hydrocarbon blowing technology, the following safety related issues should be taken into consideration:

- approximately 60% of the blowing agent (butane) is emitted into the atmosphere during the extrusion process at the crossover section;
- one of the most hazardous zone is around at the die head due to the high emission of butane at this unit;
- due to the high probability of the polymer blocking inside the extruder resulting from solidification in case of electricity cut off, (problems of cooling system of the extruder, mechanical defects, etc.) butane can be detected in the PE feeding section of the extruder;
- approximately 40% of butane will be emitted into the atmosphere during storage of the final products;
- a safety certification of the plants converted to a hydrocarbon blowing technology is required by the national rules and regulation.

In addition to the industrial safety arrangements human health related precautions should also be taken into account as follows:

- the national and international standard for food products packaging require application of high purity (food grade) of the packaging materials. Therefore the butane supplying system has to have a purification unit (molecular sieves based) to ensure separation of impurities (e.g. mercaptans and other sulphur containing impurities).

5. STRATEGY OF ODS PHASE-OUT FROM THE EPE/EPS SUB-SECTOR

In view of the above described specific features of both sub-sectors, the Government has decided to address the sub-sector for conversion using a “group project” approach¹ as following:

5.1. Phase-out of CFC-12 from the EPE sub-sector

5.1.1. Summary of the 1st group projects to cover 25 enterprises with 46 extrusion lines and total CFC-12 consumption of 1,146 Mt.

The project was approved by the 25th meeting of the Excom for the total of US\$ 4,488.516 with the cost-effectiveness of 3,92 US\$/kg.

The total annual **installed production capacity** of the extrusion lines of this group of factories is 4.400 t of nets calculated based on the nets output of 36 extruders at 25 kg/h and 10 extruders at 14 kg/h each which are in operation in total 4.250 working hours per year under three and two shifts. The blend of PE resin/CFC-12 consists of 20% CFC-12 by weight. The total **actual production capacity** of the group factories covered by the project is 4.382 t of nets (as per approved project).

Although the factories of this project will be converted on the individual lists or in small sub-groups, the project budget was calculated taking into account the recommendations of the Excom regarding a new approach to the SME and group projects (e.g. cost of local equipment estimated with expected of a discount for bulky purchase, cost of engineering and consultancy services approved as a lump sum, etc.)

The project completion is planned for mid year 2000.

5.1.2. Summary of the 2nd group project is covering 27 enterprises with 47 extrusion lines with the total CFC-12 consumption of 825.7 Mt of ODP

The project was approved by the 28th meeting of the Excom for the total US\$ 5,289,441 with the cost-effectiveness of 6,43 US\$/kg.

¹ By the end of 1997 several projects have been approved to phase-out 690 Mt of ODP from 7 enterprises.

The total annual **installed production capacity** of this group of factories is 3.310 t of PE nets, calculated based on the nets output of 11 extruders of 25 kg/h and 36 extruders of 14 kg/h which are in operation 4.250 working hours per year under three and two shifts. The total actual production capacity of this group of factories is 3.288 t of nets (as for approved project).

The structure of the 2nd group project and its implementation strategy is similar to the 1st group project for the EPE sub-sector.

The project completion is planned for mid of year 2001.

5.1.3. Summary of the terminal umbrella project component for the EPE sub-sector (as a part of the Terminal umbrella project for the EPE/EPS sector)

The remaining enterprises (see Annex 1) of the EPE sub-sector (75 factories with total of 130 extrusion lines) will be converted under the terminal project in accordance with the requirements and recommendations of the Decision 25/50 related to the terminal umbrella projects:

- a. The project budget to be requested from the Multilateral Fund is estimated based on the following conditions:
 - actual average of CFC-12 consumption by the group during 1996-1998 is 409,3 Mt (see Table 5);
 - expected savings from substitution of CFC-12 by butane are not applicable for the terminal umbrella projects;
 - established cost-effectiveness threshold for the sector (US\$ 8,23 per kg of ODP) is not applicable for the individual enterprises within the group but should not be exceeded by the total requested project budget;
 - in light of the Decision 25/50, eligible additional fund directly related to an innovative implementation approach including the “industrial rationalization” within the group will also be requested;
 - the EPE sub-component of the terminal project budget is estimated at US\$ 3,3 mio. (with estimated cost-effectiveness of 8,0 US\$/kg).
- b. Based on the data of the approved EPE group projects, the average cost of the conversion of one extrusion line is approx. US\$ 130,000 (excluding a cost-sharing by the end-user).
In this connection and in view of the above observations, the estimated project budget will be sufficient to convert not more than 30 extrusion lines;
- c. In comparison to the EPE factories covered by two above mentioned approved projects, the remaining enterprises are smaller, equipped with one or two extruders with output of 10÷12 kg/h of nets and operate mainly in two or one shifts. The total average of CFC-12 consumption in 1996-1998 by this group was 409,3 Mt which is equivalent to 1,640 t of PE nets. In case the current production practice of this group is optimized to operate at least six months during “hot” season market demand in two shifts and five months in one shift (one month is needed for maintenance, service, etc.) in total 3.800 working hours per year, it will be sufficient to have 48-50 extrusion lines in order to maintain the current production capacity of the group of factories.

- d. It is the responsibility of the Government and SEPA in cooperation with the implementing agencies to elaborate an optimal implementation concept of the terminal project in the frame of the project budget with minimum possible negative economic and social impacts which might be caused by unavoidable restructuring of this group of factories.

It is also expected that SEPA in cooperation with the respective national agencies concerned and in accordance with the national legislation will prepare a compensation programme to be financed by the Government or from other sources of funds to support the factories which have to be closed or to be converted outside of the project.

5.2. Phase-out CFC-12 from the EPS sub-sector

The sub-sector is represented in total by 73 enterprises all established before 1995 with the total average CFC-12 consumption of 5,290 Mt during 1996-1998. Presently 18 factories with total CFC-12 consumption of 2,440 Mt are covered by the approved projects.

The remaining 55 EPS factories with total 82 extruders (see Annex 2) will be addressed for the conversion to the butane blowing technology under the following two group projects and the terminal umbrella project (as the integral part of the EPE/EPS sectoral terminal umbrella project):

- a. 1st EPS group project for phase-out of 1,250 Mt of ODP from 22 enterprises.
- planned submission time - mid year 2000;
 - planned completion time - end year 2002;
 - estimated project budget - US\$ 6,5 mio.;
 - estimated cost-effectiveness - 5,2 US\$/kg.
- b. 2nd EPS group project for phase-out of 1200 Mt of ODP from 21 enterprises
- c. planned submission time - end year 2000;
 - d. planned completion time - mid year 2003;
 - e. estimated project budget - US\$ 6,3 mio.;
 - f. estimated cost-effectiveness - 5.2 US\$/kg.
- c. Terminal Umbrella Project for phase-out of 809,3 Mt of ODP from 85 enterprises of EPE/EPS sub-sector.
- Project summary
- EPE project component:
 - 75 enterprises with 130 extrusion lines with total CFC-12 consumption of 409,3 Mt;
 - the maximal number of the extrusion lines eligible for the project funding - 50 units;
 - estimated budget of the component - US\$ 3,3 mio.;
 - estimated cost-effectiveness - 8,0 US\$/kg;

- EPS project component:
 - 12 enterprises with 12 extrusion lines with total CFC-12 consumption of 400 Mt;
 - the maximum number of extrusion lines eligible for the project funding - 10 units;
 - estimated budget of the component - US\$ 3,2 mio.;
 - estimated cost-effectiveness - 8,0 US\$/kg.

- Terminal Umbrella Project for EPE/EPS sub-sector
 - planned submission time - mid year 2001;
 - planned completion time - end year 2003;
 - estimated project budget - US\$ 6,5 mio.;
 - estimated cost-effectiveness - 8,0 US\$/kg.

5.2.1. Summary of the 1st EPS group project to phase-out of 1,250 Mt of ODP from 22 enterprises

The 14 factories selected for this project are equipped with 2 extrusion lines and 8 factories with 1 extrusion line with foam output of 50 kg/h. Currently the factories of the first sub-group (with two extruders) are operating in most cases in two shifts (3.840 hours per year); some of them in one shift (1.920 hours per year) during winter time. The factories of the second sub-group (with one extrusion line) are usually operating in one shift. The total calculated **installed capacity** of these factories selected for the project is 6.000 tonnes of foam; the **actual capacity** is 5.950 t of foam (with 17% of CFC-12 by weight in the blend PS resin/CFC-12).

5.2.2. Summary of the 2nd EPS group project to phase-out of 1.200 Mt of ODP from 21 enterprises

It is planned, that this group project will cover 13 factories with two extrusion lines and 8 factories with one extrusion line of 50 kg/h of foam output each.

The current operating practice of these factories is similar to the above first EPS group project. Using the same methodology as for the first project, the calculated total **installed capacity** of this group of factories is 5.770 t of foam; the total **actual capacity** is 5.700 t.

5.2.3. Summary of the terminal umbrella Project to phase-out of 809,3 Mt of ODP from 85 enterprises of EPE/EPS sub-sector

The concept of the project was elaborated in line with the recommendations and requirements of the Decision 19/32 as well as the Decision 25/50 para d.

The data related to the EPE part of this terminal umbrella project are provided in the item 5.1.3. above.

All 12 factories selected for the EPS part of the terminal project are equipped with one extrusion line with 50 kg/h output of foam and operate in two shifts. Based on the current production practice, the total **installed capacity** of these factories is 2.300 t of foam; the **actual production capacity** is 1.900 t of foam.

The above data show that the actual production capacity can be maintained at the current level using only 10 retrofitted extrusion lines to be covered by the project.

Similar to the EPE part of the terminal project it is the Government and SEPA responsibility to decide about the final list of 10 EPS enterprises only to be selected for the project.

5.3. Cost-effectiveness of the EPE/EPS projects

The projects for these sub-sectors approved by the Executive Committee for China before 1998 are dealing with the individual enterprises with relatively high CFC-12 consumption: average 100 Mt for the EPE and 135 Mt for the EPS per year per factory. Due to the expecting savings from the replacement of CFC-12 by butane, the calculated savings (also relatively high) are deducted from the total estimated project budgets. As a result, the average cost-effectiveness of the previously approved individual projects is 4,6 US\$/kg for EPE and 3,5 US\$/kg for EPS factories respectively (Table 2).

In the case of the group projects, the ICC and savings should also be calculated for the individual enterprises in accordance with the relevant rules and guidance of the Multilateral Fund. Due to the low CFC-12 consumption by the factories of the group projects (average 35 Mt for the EPE and 55 Mt for the EPS per factory per year), a level of possible savings is also lower in comparison to the bigger CFC-12 consumer. As a result, these projects are less cost-effective (average 5,2 US\$/kg for the EPE sub-sector, 'as approved', see para 5.1.1 and 5.1.2. and 5,2 US\$/kg for the EPS sub-sector 'estimated', see para 5.2 a,b).

As for the proposed terminal umbrella project is concerned, the estimated cost-effectiveness is close to the established threshold (8,23 US\$/kg), because:

- the ICC per extrusion line for retrofitting is the same for the group projects and for the terminal umbrella;
- the IOC or savings are not applicable for this project (Decision 25/50, para d. IV);
- although the "industrial rationalization" concept is applied (Decision 25/50 para d.III), US\$ 250,000 of additional fund is included as per Decision 25/50 para d. V.
- due to the limited financial capacities of the factories, their cost-sharing for the conversion will be at minimal level;
- significant difference between the maximum number of EPE extruders (30 units) which may be retrofitted under the estimated project budget and the actual required number (50 units)

5.4. Strategy of industrial rationalization of the EPE/EPS sub-sector

The 25th Excom recommended to SEPA and the implementing agencies to apply a concept of "industrial rationalization" when formulating and implementing the umbrella projects for the SME sub-sectors. The subject was thoroughly investigated in light of possible technical, commercial and social impact of such process as well as based on the initial experience in implementation of the first EP umbrella project for china.

In line with the Decision 25/50 para C, the government of China decided to address the enterprises of the sub-sector for the ODS phase-out with several group (umbrella) projects and one terminal umbrella project.

Theoretically, there are numbers of measures, aimed at the technical, commercial and management optimization of the conversion process applicable for the “industrial rationalization” concept for the group umbrella projects. In general terms the “rationalization” task for the EP/EPS group and terminal umbrella projects might be achieved through implementation of the following concept:

- a. Reduction of the total number of the enterprises within the group through closure of selected enterprises and relation of their extrusion lines (without reduction of the total number) to the selected more technically and financially strong and better managed enterprises and to maintain the previous total installed and actual production capacity of the group by the enlarged enterprises;
- b. Reduction of the total number of the enterprises or/and the total number of extrusion lines of the group through closure of the selected enterprises, reduction of the number of extruders to optimize and balance the installed and actual production capacity of the individual factories and enlargement of the selected enterprises through relocation of extruders from the factories to be closed.

Implementation of the above described concepts of the industrial rationalization will lead to the following unavoidable additional conversion costs which are not foreseen by the existing financial rules of the Multilateral Fund:

1. Relocation of production facilities and enlargement of selected enterprises

- costs of disassembling of equipment and utility systems, transportation to a new place etc.;
- costs of civil/electrical/mechanical works, required for accommodation of the relocated equipment;
- costs of installation and commissioning of the relocated equipment, associated with the process of retrofitting;
- training costs of operational and managerial personnel.

2. Closure of enterprises

- reimbursement or compensation of the owners (shareholders) of the enterprises;
- compensation of the operational and managerial personnel;
- retraining of the personnel for the new jobs.

It is obvious that practical implementation of the above described concepts of industrial rationalization (especially the procedure of closure of enterprises) should be done in accordance with the local environmental regulatory system and legislation. Such legislation should consist of not only environmental restrictions but also the measures and possibilities of financial and social compensation and assistance from the Government to motivate the public and private sectors to introduce advanced environment friendly technologies.

At the actual conditions of industrial and economic development of China, the following issues should be taken into consideration for practical implementation of the Decision 25/50:

- the factories combined under the projects are, in fact, completely independent and at the conditions of the open market oriented economy are even competitors . Therefore they will be approached for conversion separately ;
- the current operating practice of the factories in terms of total working hours per extruder per year is directly linked with the level of employment and the market demands and therefore has very limited flexibility to be changed and can only be related to the really existing extra capacities.

In view of the above mentioned considerations, SEPA in cooperation with the relevant national agencies and organizations concerned as well as with the project beneficiaries, will elaborate a fund mobilization system to cover the above mentioned additional costs associated with the industrial rationalization and not included in the group project budgets.

However due to the extreme complexity of the issue, it will also be necessary in the future to seek the additional guidance of the Executive Committee

6. INSTITUTIONAL SUPPORT

6.1. China Ozone Layer Protection Leading Group, established in 1992 , is a governmental trans-department coordination institution with responsibility of organization and coordination work during implementation of the "Vienna Convention" and the "Montreal Protocol".

The composition of the leading group is as follows:

Group Leader Unit:	SEPA
Deputy Group Leader Unit:	The Ministry of Foreign Affairs State Development and Planning Commission State Economy and Trade Commission The Ministry of Science and Technology The Ministry of Finance
Group Member Unit:	The Ministry of Public Security The Ministry of Information Industry State Machinery Administration State Taxation Bureau State Petro-chemical Industry Administration State Internal Trade Administration Ministry of Agriculture The General Administration of Customs State Light Industry Bureau State Tobacco Monopoly Bureau State Medicine Supervision and Administration Bureau

6.2. The Ozone Layer Protection Working Group was set up under the Leading Group, whose members were designated by each group leader units. The Working Group's Office located at SEPA deals with the daily work of the Leading Group . The Ozone Layer Protection Working Group is responsible for :

- Implementation of the "Vienna Convention" and the "Montreal Protocol"
- Coordination of ODS production, importation, exportation and consumption
- Local and overseas fund mobilization for implementation of the Country Programme
- Submission of various programmes and proposals to the Ozone Layer Protection Leading Group

6.3. The Ozone Layer Protection MLF Project Management Office with responsibility of organizing the execution of the Country Programme was set up at SEPA. It is wholly responsible for project selection, preparation and application with MLF financing and also for unified coordination, management and supervision during project implementation.

The Specialised Foam Working Group of SEPA has elaborated two guidance documents for formulation and implementation of the programme for ODS phase-out from the foam sector of China:

- “Foam Umbrella Project Preparation and Implementation Mechanizm:
- “Implementation Guidance for Foam Umbrella projects.

7. ESTABLISHMENT OF TECHNICAL SERVICE CENTER FOR FOAM SECTOR

In order to support quality control of the substitute products as well as to follow-up and monitor the functions of substitute products, to conduct overall CFCs conversion programme and to speed up promotion and utilization of CFCs substitutes, a Technical Monitoring and Evaluation Centre for CFCs conversion of foam sector is proposed to be set up at the Plastic Processing Application Institute under China Light Industry Bureau and State Plastic Product Monitoring & Inspection Centre. The Centre will provide the advisory and assistance for the industry in the following areas:

- Analysis of raw materials and final products performance tests;
- Demonstration workshop on CFCs conversion to promote ODS free production in foam plastic sector, including staff training, technical assistance, training of equipment conversion and maintenance;
- Quality management and standardization;
- Training on safety measures of hydrocarbon substances handling for production enterprises;

8. ODS RELATED POLICY MEASURES AND BANS

8.1. Product quality Management

- “Standard on PE Foam Product Using ODS Substitute as Foaming Agent” will be formulated at during period of 1999 and 2001;

- “Standard on PE Foam Product Using ODS Substitute as Foaming Agent” will be formulated during period of 1999 and 2001;
- “Standard on Rigid PU Foam Series Product Using ODS Substitute as Foaming Agent” will be formulated during the period of 2000 and 2002;
- “Standard on flexible PU Foam Series Product Using ODS Substitute as Foaming Agent” will be formulated during the period of 2001 and 2002.

8.2. Production and safety Management

- “Safety Production Code on PS/PE Foam Production Using Flammable and Explosive Foaming Agent (Proposed)” will be formulated during period of 2000 and 2001;
- “Safety Production Code on PU rigid Foam (Proposed)” will be formulated during the period of 2001 and 2002.

8.3. Bans

- “Announcement about Prohibition of Newly Produced ODS Production Equipment and Newly Produced Equipment Using ODS” was jointly released by NEPA, SDPC, SETC, State Industrial and Commercial Bureau in 1997.
- China has commenced closure process in chemical production industry including CFC-12 production. Gradual reduction of CFC-12 supply until zero will guarantee the overall CFC free production within PS/PE enterprises.
- “Series Announcement on Prohibition of Using CFCs as Foam Agent in Production in PS/PE foam Sector” will be released jointly with relevant line ministries in 2005. **The EPS/EPE enterprises established after July 1995 are requested to convert by themselves or close down in order to realize overall phase-out within this sub-sector.**
- Other related policies and directives will be released by the government:
 - Establish quota management system in ODS production, consumption and importation.
 - Establish tax reduction and exemption system in ODS and substitutes production, consumption, import, recycle as well as R & D and import ODS substitute technology.

List of remaining enterprises in the EPE sub-sector

	Enterprise (PE)	Number of Extrusion Lines		Enterprise	Number of Extrusion Lines
1	Shandong Xixia Plastics Foam Nets Plant	2	25	Longkou Tianjia Packaing Nets Plant	1
2	Shandong Tianyu Fruit Refrigeration Company	1	26	Shandong Jishu Packaging Nets Plant	1
3	Shandong Lifang Fruit Packaging Plant	2	27	Shandong Jiangjiagou Packaging Nets Plant	2
4	Shandong Sitong Packaging Nets Plant	1	28	Longkou Dayu Packaging Nets Plant	2
5	Shandong Xixia Rug Plant	1	29	Longkou Changfa Packaging Nets Plant	2
6	Shandong Xixia Fruit Freshness-retaining Packing Plant	1	30	Longkou Baixing Packaging Nets Plant	2
7	Shandong Tongda Packaging Nets Plant	3	31	Shanxi Pucheng Xingguo Packaging Nets Plant	2
8	Shandong Hefengqiao Packaging Nets Plant	1	32	PuchengHongjin Packaging Nets Plant	1
9	Shandong Nongfa Packaging Nets Plant	1	33	PuchengJinguo Packaging Nets Plant	2
10	Shandong Xicheng Packaging Nets Plant	2	34	PuchengXingzhen Packaging Nets Plant	1
11	Shandong Liyuan Packaging Nets Plant	3	35	PuchengBaofeng Packaging Nets Plant	4
12	Shandong Yongxing Packaging Nets Plant	3	36	Pucheng Xingshen Packaging Nets Plant	1
13	Shandong Guofeng Fruit Company Packaing Nets Plant	1	37	Pucheng Guangda Packaging Nets Plant	3
14	Shandong Nantaigang Packaging Nets Plant	1	38	Pucheng Gongguo Packaging Nets Plant	1
15	Shandong Shewo Caiyin Packaging Nets Plant	1	39	Pucheng Xingquan Packaging Nets Plant	4
16	Shandong She'an Packaging Nets Plant	1	40	Pucheng Tongxing Packaging Nets Plant	1
17	Shandong Qushi Fruit Packaging Nets Plant	1	41	Pucheng Laosong Packaging Nets Plant	3
18	Shandong JingCheng Packaging Nets Plant	2	42	Pucheng Xinxing Packaging Nets Plant	4
19	Shandong Xinlong Packaging Nets Plant	1	43	Pucheng Fupingzhuang Packaging Nets Plant	1

	Enterprise (PE)	Number of Extrusion Lines		Enterprise	Number of Extrusion Lines
20	Qingdao Lishida Plastics Co., Ltd.	2	44	Pucheng Xuezhen Packaging Nets Plant	2
21	Shandong Longkou Donglian Packaing Plant	1	45	Pucheng Jinyao Packaging Nets Plant	1
22	Longkou Fuyou Packaging Nets Plant	3	46	Pucheng Sufang Packaging Nets Plant	1
23	Longkou Shiliang Gongxiashe Packaging Nets Plant	2	47	Pucheng Gaoxin Packaging Nets Plant	1
24	Longkou Changlunzhuang Packaging Nets Plant	1	48	Pucheng Beiguan Packaging Nets Plant	1
49	Shanxi PuchengHongtupo Packaging Nets Plant	1	63	Shanxi Hualong Packaging Nets Plant	2
50	Shanxi Liquan Guangda Packaging Nets Plant	5	64	Shanxi Huacheng Packaging Nets Plant	2
51	ShanxiYulan Packaging Nets Plant	3	65	Shanxi Rongchang Packaging Nets Plant	2
52	Shanxi Baoxian Packaging Nets Plant	2	66	Shanxi Dahua Packaging Nets Plant	1
53	Shanxi Wanda Packaging Nets Plant	2	67	Shanxi Xingyuxing Packaging Nets Plant	2
54	Shanxi Sihai Packaging Nets Plant	2	68	Shanxi Chenzhong Packaging Nets Plant	1
55	Shanxi Xuehua Packaging Nets Plant	2	69	Shanxi Poli Packaging Nets Plant	1
56	Shanxi Shuangfa Packaging Nets Plant	2	70	Shanxi Paper Packaging Plant	2
57	Shanxi Lianfa Packaging Nets Plant	1	71	Shanxi Qian County Packaging Nets Plant	2
58	Shanxi Jianling Packaging Nets Plant	1	72	Sichuan Deyang Hede Plastics Factory	1
59	Shanxi Longda Packaging Nets Plant	2	73	Sichuan Mianyang Weipu Company	1
60	Shanxi Qianxing Packaging Nets Plant	2	74	Sichuan Tiansheng Packaging Materials Co., Ltd	1
61	Shanxi Wenming Packaging Nets Plant	2	75	Sichuan Chongqing Bishan Packaging Nets Plant	1
62	Shanxi Lantian Packaging Nets Plant	2		<i>Total Number of Extrusion Lines</i>	130

List of remaining enterprises in the EPS sub-sector

<i>1</i>	Guangdong Shenzhen Defengsheng Co., Ltd.	<i>29</i>	Hangzhou Jinying Plastic Products Co., Ltd.
<i>2</i>	Guangdong Zhuhai Xinfuhua Fast Food Appliance Co., Ltd.	<i>30</i>	Hangzhou Kangda Plastic & Ruber
<i>3</i>	Guangdong Nanhai Haiyang Compound material Co., Ltd.	<i>31</i>	Anhui Wuhu Plastic Plant No.4
<i>4</i>	Guangdong Nanhai Boli	<i>32</i>	Wuhan Quanyang Plastic Products Co., Ltd.
<i>5</i>	Guangdong Fushan Wanda Plastic Products Industry Co.	<i>33</i>	Hunan Weiyang Plastic Packing Co., Ltd.
<i>6</i>	Guangdong Fushan Meihua	<i>34</i>	Beijing Changquan Packaging Instrument Co., Ltd
<i>7</i>	Guangdong Dongguan Yufeng	<i>35</i>	Beijing Yanshan Plastics Products Co., Ltd.
<i>8</i>	Guangdong Dongguan Yongsheng	<i>36</i>	Beijing Anshun Packaing Machinery Co., Ltd.
<i>9</i>	Guangdong Dongguan Wanlong	<i>37</i>	Langfang Guanglai Plastics Co., Ltd.
<i>10</i>	Guangdong Huizhou Huanmei	<i>38</i>	Beijing Zhengyao Plastics Packaging Co., Ltd.
<i>11</i>	Guangdong Guangzhou Jindongfang	<i>39</i>	Beijing Hongya Plastics Products Co., Ltd.
<i>12</i>	Guangdong Guangzhou Huahui	<i>40</i>	Tianjin Yuxin Plastics Packaging Co., Ltd.
<i>13</i>	Guangdong Shenzhen Yuanfengsheng	<i>41</i>	Shandong Yangxin Luhuan Degadation Plastics Co., Ltd.
<i>14</i>	Fujian Zhangzhou Baochang Plastic Products Co., Ltd.	<i>42</i>	Jinan Hongli Food Containers Co., Ltd.
<i>15</i>	Fujian Xiamen Anjin Houkeng PSP Sheet Products Plant	<i>43</i>	Qingdao Guanlai Plastics Co., Ltd
<i>16</i>	Fujian Xiamen Yanyuan Degradation Resin Co., Ltd.	<i>44</i>	Shijiazhang Ximing Disposal Food Containers Plant
<i>17</i>	Guangdong Shantou Baocheng Resin Co., Ltd.	<i>45</i>	Shijiazhuang Kuangkuai Fast Food Containers Plant
<i>18</i>	Guangxi Nanning Xinchang New Plastic Products Co.,	<i>46</i>	Taiyuan Plastics Plant

	Ltd.		
19	Shanghai Yifeng Plastic Packing Co., Ltd.	47	Bazhou Company
20	Shanghai Shangfu Plastic Products Co., Ltd.	48	Shenyang Shangwei Company
21	Central Chemical Co., Ltd.	49	Harbin Duona Company
22	Shanghai Yangji Plastic Products Co., Ltd.	50	Daqing Lindian Food Containers Plant
23	Shanghai Xinli Plastic Products Co., Ltd.	51	Harbin Quanxie Company
24	Jiangsu Kunshan Baoli Plastic Co., Ltd.	52	Liaoning Fuxin Degradation Resin Packaging Co., Ltd.
25	Nanjing Yue'an Plastic Enterprise Co., Ltd.	53	Chongqing Minghong Plastics Development Co., Ltd.
26	Nanjing Fast Food Appliance Plant	54	Chengdu Plastics Packaging Factory
27	Jiangsu Nantong Yuanfu Plastic Dinnerware Co.	55	Jinan Hongli Food Container Co, Ltd., Xi'an Branch
28	Zhejiang Taizhou Nenjiang Hongda Plastic Products Plant		<i>Total Number of Extrusion Lines: 82</i>

68. Having taken note of the comments and recommendations of the Sub-Committee on Project Review (UNEP/OzL.Pro/ExCom/25/17, paragraphs 52 to 57), the Executive Committee decided to approve the above nine projects at the level of funding indicated in Annex III to the present report.

(Decision 25/33)

69. In connection with the above methyl bromide projects, the representative of Pesticide Action Network North America expressed concern that project descriptions contained no evidence that NGOs had been included in the project preparation process or would be involved in project implementation, despite their broad experience in working with farmers to promote new agricultural techniques and the fact that the methyl bromide project guidelines specifically called for participation of appropriate stakeholders, including farmers' associations and NGOs, in both project preparation and implementation. Because the NGO community was diverse and decentralized, the Pesticide Action Network and Friends of the Earth had established a system of contact groups to act as focal points and to streamline the process of working with NGOs in the development and implementation of methyl bromide alternative projects. The implementing agencies had been advised of this contact group system and it was hoped that they would take advantage of this resource in implementing the projects approved and in developing future methyl bromide projects.

Foam Sector

China: Elimination of CFC-12 in manufacturing of EPE foam packaging nets at 25 enterprises (umbrella project) (UNEP/OzL.Pro/ExCom/25/30 and Add.1)

70. Having taken note of the comments and recommendations of the Sub-Committee on Project Review (UNEP/OzL.Pro/ExCom/25/17, paragraphs 61 to 63), the Executive Committee decided:

- (a) To approve the above project at the level of funding indicated in Annex III to the present report;
- (b) To request the Government of China, in cooperation with the relevant implementing agencies, to prepare a sectoral strategy plan for the polyethylene/polystyrene foam sub-sector, and that approval of future projects in the sub-sector be dependent on the preparation of such a plan.

(Decision 25/34)

(f) New policy papers

(i) Terminal umbrella projects

87. Having taken note of the comments and recommendations of the Sub-Committee on Project Review (UNEP/OzL.Pro/ExCom/25/17, paragraphs 95 and 96), the Executive Committee decided that the following modalities should be adopted on a trial basis:

- (a) Where the number of enterprises is large (over 50) and the quality of information is not high, umbrella projects are not an appropriate methodology.
- (b) If a country wishes to approach the sectoral phase-out in a single step, a sectoral strategy could be implemented based on a performance agreement with the government concerned.
- (c) Where a country does not wish to implement a sectoral strategy, enterprises could be grouped in a series of separate umbrella projects. The final project could then be submitted as a terminal umbrella project.
- (d) Where there are significant numbers of small or informal enterprises remaining, the final project should be developed using the following new approach designed to address the remaining small enterprises:
 - (i) Proposals should include: (a) institutional support through government policy directives or legislation; a timed action plan and expected results in terms of ODS phase-out; coordination and management by ozone offices and/or financial intermediaries; technology transfer, monitoring and supervision from industry associations and/or component suppliers and systems houses; and (b) the appropriate choice of technology, innovative methodologies for achieving technology transfer; achievement of economies of scale through geographical groupings or industrial rationalization; financial arrangements which could provide flexibility in the allocation of approved resources.
 - (ii) The requirements for capital equipment should be determined by establishing the typical equipment needed for an enterprise representative of those remaining in the sector (equipment requirements will be modest and will generally be similar), and the estimated number of enterprises involved, taking into account the possibility of industrial rationalization.
 - (iii) The technology transfer, trials and support activities will be costed on the basis of the activities being provided by local technical resources at local rates (where established as essential, with provision of international support on start-up to train the trainers, and on completion to verify phase-out).
 - (iv) Incremental operating costs or savings will not be included in project costs.
 - (v) Funding could include agreed support for some of the government activities outlined in (i) above.

(Decision 25/50)

- (h) These initial guidelines will be considered for review after sufficient projects in this sector have been considered, to enable general conclusions on costs to be drawn. The review will include consideration of a cost effectiveness threshold.
- (i) Pending a review, the cost-effectiveness of project proposals will be considered on a case-by-case basis.

(Decision 28/45)

- (iii) Strategy plan of ODS phase-out from production of extruded polyethylene and polystyrene foams sub-sectors of China (UNEP/OzL.Pro/ExCom/28/49)

78. Having taken note of the comments and recommendations of the Sub-Committee on Project Review (UNEP/OzL.Pro/ExCom/28/18, paras. 39 and 40), the Executive Committee decided to request UNIDO to refine the strategy plan for ODS phase-out from production of the extruded polyethylene and polystyrene foam sub-sectors of China, and resubmit it to the Executive Committee. In the revised strategy, the total capacity of the enterprises for which funding for conversion would be sought would correspond to the existing level of production of the sub-sector indicated in the strategy, including those projects already approved.

(Decision 28/46)

79. At the time of adoption of the decision, one representative expressed concern about the clarity of the language used in the last sentence of the decision.

- (iv) Indian halon phase-out strategy (UNEP/OzL.Pro/ExCom/28/50 and Corr.1)

80. Having taken note of the comments and recommendations of the Sub-Committee on Project Review (UNEP/OzL.Pro/ExCom/28/18, paras. 41 and 42), the Executive Committee took note of the Indian halon phase-out strategy, as contained in documents UNEP/OzL.Pro/ExCom/28/50 and Corr.1, and of the Secretariat's comments thereon.

- (v) Interim report of the Chair of the Working Group on the Phase-out Plan for the Solvent Sector in China

81. The Chair of the Working Group on the Phase-out Plan for the Solvent Sector in China presented an interim report on progress in its work. During the meeting of the Open Ended Working Group in Geneva, on 15 and 16 June 1999, two informal meetings of the Group had been convened and two formal meetings had taken place in Montreal on 12 and 14 July 1999. The Working Group had identified areas that needed additional work, including continued refinement of data and implementation modalities including a revolving assistance mechanism for the small-size users.

82. The Working Group had discussed the following at those meetings:

- Data for CFC-113 are 80 per cent complete. The remaining consumption by small-size solvent users could be addressed by a targeted sampling survey covering small users in