

**MONTREAL PROTOCOL  
ON SUBSTANCES THAT DEplete  
THE OZONE LAYER**



**UNEP**

**Technology and Economic Assessment Panel**

**SUPPLEMENT TO THE**

**APRIL 2002 TEAP REPLENISHMENT REPORT**

**“ASSESSMENT OF THE FUNDING REQUIREMENT FOR THE  
REPLENISHMENT OF THE MULTILATERAL FUND FOR THE PERIOD  
2003-2005”**

**September 2002**



**SUPPLEMENT TO THE  
APRIL 2002 TEAP REPLENISHMENT REPORT**

**“ASSESSMENT OF THE FUNDING REQUIREMENT  
FOR THE REPLENISHMENT OF THE MULTILATERAL FUND  
FOR THE PERIOD 2003-2005”**

**September 2002**

## **DISCLAIMER**

The United Nations Environment Programme (UNEP), the Technology and Economic Assessment Panel (TEAP) co-chairs and members, the Technical and Economic Options Committee, chairs, co-chairs and members, the TEAP Task Forces co-chairs and members, and the companies and organisations that employ them do not endorse the performance, worker safety, or environmental acceptability of any of the technical options discussed. Every industrial operation requires consideration of worker safety and proper disposal of contaminants and waste products. Moreover, as work continues - including additional toxicity evaluation - more information on health, environmental and safety effects of alternatives and replacements will become available for use in selecting among the options discussed in this document.

UNEP, the TEAP co-chairs and members, the Technical and Economic Options Committee, chairs, co-chairs and members, and the Technology and Economic Assessment Panel Task Forces co-chairs and members, in furnishing or distributing the information that follows, do not make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or utility; nor do they assume any liability of any kind whatsoever resulting from the use or reliance upon any information, material, or procedure contained herein.

The text of this report is composed in Times New Roman.

Co-ordination:	<b>TEAP and its Replenishment Task Force</b>
Composition:	Lambert Kuijpers
Layout:	Dawn Lindon
Reproduction:	UNON Nairobi
Date:	30 September 2002
ISBN:	92-807-2264-6

## **ACKNOWLEDGEMENTS**

The UNEP Technology and Economic Assessment Panel and the Replenishment Task Force co-chairs and members wish to express thanks to all who contributed from governments, both Article 5(1) and non-Article 5(1), to the Multilateral Fund Secretariat, to the Ozone Secretariat, to all Implementing Agencies, as well as to a large number of individuals involved in Protocol issues, without whose involvement this supplementary report to the original assessment would not have been possible.

The opinions expressed are those of the Panel and its Task Forces and do not necessarily reflect the reviews of any sponsoring or supporting organisation.

## Table of Contents

<b>TABLE OF CONTENTS.....</b>	<b>5</b>
<b>IN. INTRODUCTION.....</b>	<b>7</b>
IN.1 TERMS OF REFERENCE.....	7
IN.2 THE PROCESS.....	7
IN.3 DISTRIBUTION OF THE 2003-2005 REPLENISHMENT REPORT.....	8
IN.4 THE AD-HOC WORKING GROUP ON REPLENISHMENT.....	8
IN.5 THE MEETING OF THE AD-HOC WORKING GROUP ON REPLENISHMENT.....	8
IN.6 THE SUPPLEMENT TO THE APRIL 2002 ASSESSMENT REPORT ON THE 2003-2005 REPLENISHMENT OF THE MULTILATERAL FUND.....	10
<b>S. EXECUTIVE SUMMARY OF FINDINGS IN CHAPTERS 1-5.....</b>	<b>13</b>
S.1 UPDATING OF THE REPORT OF THE TEAP TASK FORCE ON REPLENISHMENT.....	13
S.2 SENSITIVITY ANALYSES CONSUMPTION SECTOR FOR CFCs, MB AND CTC.....	14
S.3 SENSITIVITY ANALYSES PRODUCTION SECTOR.....	17
S.4 SENSITIVITY ANALYSES FOR NON-INVESTMENT ACTIVITIES.....	18
S.5 TOTAL FUNDING REQUIREMENT.....	19
<b>1. UPDATING OF THE REPORT OF THE TEAP REPLENISHMENT TASK FORCE.....</b>	<b>21</b>
1.1 UPDATE OF THE ANALYSIS OF THE CFC CONSUMPTION SECTOR.....	21
1.2 SPECIFICATION OF THE FUNDING AMOUNTS FOR THE LINEAR REDUCTIONS FOR ALL SUBSTANCES AFTER THE YEAR 2005.....	28
1.2.1 CFC.....	28
1.2.2 CTC.....	29
1.2.3 TCA - methyl chloroform.....	30
1.2.4 Methyl Bromide.....	30
<b>2. SENSITIVITY ANALYSES CONSUMPTION SECTOR.....</b>	<b>32</b>
2.1 CFC CONSUMPTION SECTOR.....	32
2.1.1 National Phase-out Plans.....	32
2.1.2 Cost effectiveness variation of RMPs.....	33
2.1.3 CFC consumption in RMPs or in National Phase-out Plans.....	34
2.1.4 Impact of the increase in the price of CFCs.....	35
2.2 METHYL BROMIDE CONSUMPTION SECTOR.....	36
2.2.1 The impact of an increase of the 2000 MB consumption to 10,200 ODP tonnes.....	36
2.2.2 Preparation of an alternative analysis on the basis of the arithmetic mean of the cost- effectiveness values of approved projects.....	39
2.2.3 Implications of possible increases or decreases in the MB price in Article 5(1) Parties over the period of the triennium 2003-2005, while prices of alternatives are considered to remain constant.....	40
2.2.4 Implications for the funding requirement for the 2003-2005 replenishment if a 50% reduction, compared to the baseline in Article 5(1) countries MB consumption in the year 2010 is assumed.....	40
2.2.5 Evaluation of the implications for the funding requirement for the 2003-2005 replenishment, based on different assumptions of the schedule for the ratification of the Copenhagen Amendment by Article 5(1) Parties.....	41
2.3 CARBON TETRACHLORIDE CONSUMPTION SECTOR.....	43
2.3.1 Analysis of CTC consumption.....	43
2.3.1 Variation in funding requirement for CTC.....	44
<b>3. SENSITIVITY ANALYSES PRODUCTION SECTOR.....</b>	<b>45</b>
3.1 PRODUCTION SECTOR – CFCs.....	45

3.2	PRODUCTION SECTOR – METHYL BROMIDE.....	47
3.2.1	<i>The implications for the funding requirement of the phase-out of 20% of the MB production by 2005, taking into account the likely cost range of US\$3 to US\$5 per ODP-kg.....</i>	47
<b>4.</b>	<b>SENSITIVITY ANALYSES FOR NON-INVESTMENT ACTIVITIES .....</b>	<b>48</b>
4.1	COUNTRY PROGRAMMES.....	48
4.2	OPERATING COSTS OF THE EXECUTIVE COMMITTEE AND THE MLF SECRETARIAT .....	48
4.3	INSTITUTIONAL STRENGTHENING – FUNDING REQUIREMENT 2003-2005.....	48
4.4	AGENCY SUPPORT COSTS .....	49
<b>5.</b>	<b>TOTAL FUNDING REQUIREMENT .....</b>	<b>51</b>
<b>6.</b>	<b>REFERENCES.....</b>	<b>54</b>
	<b>ANNEX 1 - MEETING REPORT UNEP/OZL.PRO/WG.5/1, 16 AUGUST 2002.....</b>	<b>55</b>
	<b>ADDENDUM.....</b>	<b>63</b>
	PROCEDURES APPLIED TO DETERMINE THE FUNDING REQUIREMENT FOR THE CFC CONSUMPTION SECTOR .....	63

## **IN. Introduction**

### **IN.1 Terms of Reference**

Decision XIII/1 of the Thirteenth Meeting of the Parties requests, in its paragraph 1, the Technology and Economic Assessment Panel (TEAP) to prepare a report for submission to the 14th Meeting of the Parties (Rome, November 2002), and present it through the Open-ended Working Group at its 22nd meeting (Montreal, July 2002) to enable the 14th Meeting of the Parties to take a decision on the appropriate level of the 2003-2005 Replenishment of the Multilateral Fund. As mentioned in the Report of the 13th Meeting of the Parties (see document UNEP/OzL.Pro.13/10), Decision XIII/1 specifies the issues the Panel should take into account and directs the Technology and Economic Assessment Panel, in undertaking this task, to consult widely with relevant persons and institutions and other relevant sources of information deemed useful.

### **IN.2 The Process**

The TEAP established a Task Force to prepare the report on the 2003-2005 replenishment of the Multilateral Fund, in consultation with the full TEAP membership. The members of the Task Force were

- ❑ László Dobó (Hungary, Senior Expert member TEAP);
- ❑ Lambert Kuijpers (Netherlands, co-chair TEAP, co-chair RTOC);
- ❑ Roberto Peixoto (Brazil, member RTOC);
- ❑ Jose Pons Pons (Venezuela, member TEAP, co-chair ATOC); and
- ❑ Shiqiu Zhang (China, Senior Expert member TEAP).

Consulting members were

- ❑ Melanie Miller (Belgium, member MBTOC); and
- ❑ Jonathan Banks (Australia, member TEAP, co-chair MBTOC).

The Replenishment Task Force conceived two draft reports on the funding requirement for the replenishment of the Multilateral Fund for the triennium 2003-2005.

An external review for consistency and accuracy of data was conducted by:

- ❑ Heinrich Kraus (Germany, 2001 Executive Committee chair);
- ❑ Hassen Hannachi (Tunisia, 2001 Executive Committee vice-chair);
- ❑ Omar El-Arini (Chief Officer of the Multilateral Fund Secretariat) and
- ❑ Michael Graber (Dep. Executive Secretary of the Ozone Secretariat).

A third draft report was subsequently composed for discussions before the TEAP meeting in Budapest. The final review and the completion of the document was carried out by the TEAP at its meeting in Budapest during 29 April - 3 May 2002.

### **IN.3 Distribution of the 2003-2005 Replenishment Report**

The April 2002 Report was distributed:

- ❑ via e-mail and courier to the members of the Ad-hoc Working Group on Replenishment;
- ❑ via downloading from the website of UNEP's Ozone Secretariat and the TEAP;
- ❑ via air mail in the official UNEP printed format to all Parties to the Montreal Protocol and to participants involved in the process.

### **IN.4 The Ad-hoc Working Group on Replenishment**

The Thirteenth Meeting of the Parties (Colombo, Sri Lanka, October 2001), noted that an Ad-hoc Working Group was set up by the 10th Meeting of the Parties to work closely with the TEAP to review the study on the 2000-2002 replenishment, and noted further that the involvement of the Ad-hoc Working Group in the course of the study had enhanced its outcome. The Meeting therefore decided to set up an Ad-hoc Working Group on the 2003-2005 Replenishment with membership comprising of Parties operating under Article 5(1) (*Argentina, Brazil (co-chair), China, Colombia, India, Iran (Islamic Rep of), Nigeria, Tanzania and Zimbabwe*) and Parties not operating under Article 5(1) (*Australia, Finland (co-chair), France, Germany, Italy, Japan, Poland, United Kingdom of Great Britain and Northern Ireland, and the United States of America*).

### **IN.5 The Meeting of the Ad-hoc Working Group on Replenishment**

As requested by the Parties, the Secretariat convened a meeting of the Ad-hoc Working Group and the TEAP (and its Replenishment Task Force) for consultation on the 2003-2005 replenishment following the 22nd meeting of the Open-ended Working Group (Montreal, 23-25 July 2002). The Ad-hoc Working Group provided initial feedback and advice on sensitivity analyses to the Technology and Economic Assessment Panel.

The meeting of the Ad-hoc Working Group on Replenishment was a full day meeting in Montreal on 26 July 2002. Participants included the fourteen members of the Ad-hoc Working Group, six members of the TEAP Task Force on Replenishment and representatives of the Multilateral Fund Secretariat.

The meeting was chaired by Mr. Benedicto Fonseca, Brazil, and Mr. Jukka Uosukainen, Finland, the co-chairs of the Ad-hoc Working Group. The Ozone Secretariat assisted the meeting.

The report on the replenishment for 2003-2005 was introduced by Dr. Lambert Kuijpers, the co-chair of the TEAP. He elaborated on the four areas on which the Task Force had based its analysis (consumption investment projects; production



investment projects; non investment activities; and areas of other funding for the implementing agencies). He also pointed out the amount of ODP tonnes, which need to be subtracted according to the agreement reflected in Executive Committee Decisions 35/57 and 36/7. Additional presentations were given by the other members of the Task Force. In their presentations, the members of the Task Force outlined the methodology and assumptions used in preparing the report and highlighted the key findings.

All members of the Ad-hoc Working Group expressed their satisfaction at the clarity and transparency of the TEAP Report and presentations.

The Chief Officer of the Multilateral Fund presented a comparison of the Report of the Task Force on Replenishment and document UNEP/OzL.Pro/ ExCom 37/66 and Corrigenda 1 and 2, clarifying the reasons for any apparent discrepancies between them concerning the data provided.

Following the presentations, members of the Ad-hoc Working Group discussed a number of issues with the Task Force, requested and received clarification on the following issues:

- ❑ The impact of the decisions taken at the 36th and 37th Executive Committee meetings on the total funding requirement for the CFC consumption sector;
- ❑ The impact of the assumed linear reduction towards a next phase-out step in the period after 2005 on the funding requirement;
- ❑ The influence on cost effectiveness values of National Sector Phase-out Plans and National Phase-out Plans;
- ❑ The implication of how servicing is addressed within the refrigeration sub-sector;
- ❑ The impact of an increase in the price of CFCs (while alternatives prices are kept constant) on the incremental operating costs and on the total project costs;
- ❑ The impact of an increase in the price of methyl bromide (while alternatives prices are kept constant) on the incremental operating costs and on the total project costs;
- ❑ The basis for the cost calculation of the phasing out the CFC production sector in Argentina, Mexico and Venezuela, as given in the April 2002 Replenishment Report /RTF02/;
- ❑ The implications for the funding requirement of further analysis of the CTC consumption, in the light of further information to be provided by Article 5(1) countries;
- ❑ The different aspects of the non-investment activities described in the April 2002 Replenishment Report /RTF02/.

Following discussion, the Ad-hoc Working Group on Replenishment recommended that the TEAP submit a Supplementary Report on a number of

aspects. It was agreed that the report on aspects to be specified would be finalised by the Task Force before the end of September 2002, be put on websites (UNEP's Ozone Secretariat's [unep.org/ozone](http://unep.org/ozone) and [teap.org](http://teap.org)) and despatched to all the members of the Ad-hoc Working Group. The Ad-hoc Working Group agreed that no further intersessional meetings of the Group were required, and that it would convene again to consider the revisions and sensitivity analyses in a Supplementary Report to the TEAP Replenishment Task Force Report /RTF02/ within the timeframe allotted for the Fourteenth Meeting of the Parties in Rome in November 2002 (see Meeting Report, document UNEP/OzL.Pro/WG.5/1, given as Annex 1 to this report).

## **IN.6 The Supplement to the April 2002 Assessment Report on the 2003-2005 Replenishment of the Multilateral Fund**

In the Montreal meeting, July 2002, the Ad-hoc Working Group on Replenishment adopted an agreement and requested the TEAP to submit a Supplementary Report on the following aspects to facilitate the Parties' consideration of the issue of replenishment:

### *Updating of the report of the TEAP Task Force on Replenishment*

1. To update the analysis of the CFC consumption sector, while taking into account all decisions of the thirty-sixth and thirty-seventh meetings of the Executive Committee.
2. To separate out and specify the funding amounts for the linear reductions for all substances for the period after 2005.

### *Sensitivity analyses - Consumption Sector*

#### **1. CFCs**

- (a) To have a plus or minus 20 per cent variation in the cost-effectiveness for National Phase-out Plans;
- (b) To conduct an analysis of the effect of a plus or minus 10 per cent variation in the administrative costs of the implementing agencies;
- (c) To conduct an analysis of the effect of a plus or minus 20 per cent variation in the cost-effectiveness of refrigerant management plans (RMP) for non-low-volume-consuming countries (LVCs);
- (d) To conduct an analysis of the effect of presuming that all CFC consumption in the servicing sector of non-low-volume-consuming countries will be addressed either through refrigerant management plans or through servicing sector components within national phase-out plans;

- (e) To analyse the implications of the increase in the price of CFCs at 3 per cent and at 7 per cent per annum over the period of the triennium, while the prices of alternatives are considered to remain constant.

## **2. Methyl bromide**

- (a) To investigate the implications for the funding requirement of an increase of the 2000 methyl bromide consumption to 10,200 ODP tonnes;
- (b) To prepare an alternative analysis on the basis of the arithmetic mean of the cost-effectiveness values of approved projects;
- (c) To analyse the implications of possible increases or decreases in the price of methyl bromide in article 5 Parties over the period of the triennium, while the prices of alternatives are considered to remain constant;
- (d) To see what are the implications for the funding requirement if a 50 per cent reduction, compared to the baseline, in article 5 countries' methyl bromide consumption in 2010 is assumed;
- (e) To evaluate the implications for the funding requirement, based on different assumptions of the schedule for the ratification of the Copenhagen Amendment by Article 5 Parties.

## **3. Carbon tetrachloride**

To investigate the implications for the funding requirement of (a) an analysis of carbon tetrachloride consumption on a country-by-country basis, in the light of further information to be provided by article 5 countries by the end of August 2002; and (b) what a plus or minus 30 per cent variation in the funding requirement would imply.

### *Sensitivity Analyses Production Sector*

#### **1. CFCs**

- (a) To conduct an analysis, applying the cost-effectiveness of the production sector phase-out projects for China and India, of the phase-out of the CFC production sector in Argentina, Mexico and Venezuela;
- (b) To conduct an analysis, applying the cost-effectiveness of the production sector phase-out project for the Democratic People's Republic of Korea, of the phase-out of the CFC production sector in Argentina, Mexico and Venezuela.

## **2. Methyl bromide**

To determine the implications for the funding requirement of the phase-out of 20 per cent of methyl bromide production by 2005, taking into account the likely cost range of \$3 to \$5 per ODP/kilogram.

### *Sensitivity Analyses Non-investment Activities*

1. To conduct an analysis of the effect of a plus or minus 20 per cent variation on the funding requirement for the preparation and/or updating of country programmes.
2. To conduct an analysis of the effect of a plus or minus 15 per cent variation on the funding requirement for the operating costs of the Executive Committee and the Multilateral Fund Secretariat.

These aspects were assessed by the TEAP Replenishment Task Force in the course of August-September 2002. The draft Supplementary Report was issued in September 2002 for review by the Replenishment Task Force and subsequently by the full TEAP. Following approval by the full TEAP, the report was submitted to the Ad-hoc Working Group on Replenishment at the beginning of October 2002, and, subsequently, to all Parties to the Montreal Protocol.

## S. Executive Summary of Findings in Chapters 1-5

### S.1 Updating of the Report of the TEAP Task Force on Replenishment

*CFC Consumption Sector.* The Task Force conducted a completely new analysis of the funding requirement for the replenishment of the Multilateral Fund during 2003-2005 for the CFC consumption sector in order to study the impact of all agreed National Phase-out Plans and National Sector Phase-out Plans. This analysis could be conducted in a more precise manner than in the earlier study /RTF02/ due to additional information regarding National Plans available after the 36th and 37th Executive Committee meeting.

The funding requirement is averaged between funding (a) as late as possible, and (b) as early as possible, yielding a smooth funding profile.

The total averaged funding requirement for the CFC consumption sector then amounts to US\$139.847 million.

Both methods result in 76% of the cost spent in the first years (the triennium 2003-2005 for the historic approach) regardless of whether the National Phase-out Plans or the historic approach with a smooth funding profile are considered. This implies that the costs for a National Phase-out Plan for each country can be determined by the application of the average factor of 0.681 on the basis of existing plans. By determining a central value and an uncertainty range, the funding requirement for CFCs is derived at US\$120.822 ± US\$19.026 million. This excludes all obligations from already agreed National Phase-out or Sectoral Phase-out Plans.

A total of US\$209.487 million for the entire CFC consumption sector can be calculated, if all agreements to date are taken into account, excluding a total of US\$20.177 million for the agency support costs. The total funding requirement, including the agency support costs, for CFCs for the period 2003-2005 amounts to **US\$229.66 ± 19.12 million.**

*Specification of Funding for Linear Reductions after 2005.* In order to determine the funding requirement for intermediate reductions towards a next compliance step, the Task Force added funding in the April 2002 Report /RTF02/ for projects to be implemented after 2005; mostly funding for projects through 2007.

*CFC.* Due to the implementation lag, the approvals for the CFC consumption sector on a project-by project basis require funding up to a maximum of US\$139.847 million. The high value allows all projects to be done on a project by project basis, which is highly unlikely with the number of agreed National Phase-out and Sector approaches increasing. It is estimated that 20% of the funding requirement for project approvals for projects on a project by project basis would concern the period after 2007, which may be US\$28.72 million at

maximum. A substantial amount will be needed for implementation between 2005 and 2007. However, with the amount of national approaches in total projects increasing, it is estimated that only one third would apply, i.e. US\$9.20 million would result in reductions after the year 2007. The application of a smooth funding profile (taking into account the implementing agencies' capacities, and the annual contributions to the Multilateral Fund) makes it unavoidable to contribute to some reductions after 2007.

**CTC.** On the basis of the calculations made in the April 2002 Replenishment Report /RTF02/, a certain amount of CTC funding contributes to reductions after the year 2005. A calculation of the amount of funding strictly required for the 85% reduction step in CTC consumption in the year 2005 yields a funding requirement for process agents and solvents of US\$32,400 million and US\$13.476 million, respectively, which equals the total of US\$45.876 million (excluding agency support costs). This would imply a reduction in the funding requirement of US\$4.177 million if support costs are included, compared to the value determined in April 2002 /RTF02/.

**TCA.** On the basis of the calculations made in the April 2002 Replenishment Report /RTF02/, a certain amount of TCA funding contributes to reductions after the year 2005. A calculation of the amount of funding strictly required for the 30% reduction step in TCA consumption in the year 2005 yields a funding requirement for TCA during the period 2003-2005 of US\$1.284 million (excluding agency support costs). This would imply a reduction in the funding requirement of US\$2.012 million if support costs are included, compared to the value determined in April 2002 /RTF02/.

**MB.** On the basis of the calculations made in the April 2002 Replenishment Report /RTF02/, a certain amount of MB funding contributes to reductions after the year 2005 (i.e. the total amount calculated in the April 2002 Report for reductions after 2005 was US\$8.55 million). This would result in a reduction of the funding requirement by US\$9.49 million if agency support costs are included.

## **S.2 Sensitivity Analyses Consumption Sector for CFCs, MB and CTC**

***CFCs-NPP Approach.*** A study of the effect of a plus or minus 20% variation in the cost-effectiveness values for National Phase-out Plans was requested by the Ad-hoc Working Group. In the estimation of the CFC consumption sector above, an average of 68.1% of the funding requirement costs for historic project by project approvals was calculated for the average National Phase-out Plan so far agreed by the Executive Committee. A 20% variation in the average costs for National Phase-out Plans results in a variation of US\$19.047 million for the triennium 2003-2005. Introducing National Phase-out Plans at 80% of the 68.1% average costs (that is 54.48% of the historic funding requirement), and combining them with a certain amount of approvals on a project by project basis results in a funding requirement of averaged US\$114.464 million with an uncertainty of

US\$25.38 million. On the other hand, introducing National Phase-out Plans at 120% of the average costs (that is 81.72% of the historic funding requirement) results in an average funding requirement of US\$129.564 million (with an uncertainty of US\$10.28 million). These values can be compared to the value derived earlier of US\$120.822 ± 19.026 million.

***CFCs-RMP funding.*** The April 2002 Report /RTF02/ mentions that, for non-LVC countries, the funding requirement needed for RMPs would be US\$2.70 million (US\$270,000 per non-LVC country). A variation in the cost effectiveness by 20% would result in a variation of US\$540,000 of the funding requirement. This is based on the figures used in the April 2002 Report /RTF02/, which were based on experience. It may well be possible that, in future, RMPs with an investment component, e.g., for servicing, may be significantly more expensive.

***CFCs-Servicing Sector.*** In this supplementary report, the funding requirement has been calculated for a historic project by project approach in which the cost effectiveness value for the servicing sector has been used as derived from Refrigerant Management Plans (RMPs). This part has been averaged with the average costs for National Phase-out Plans in which the servicing sector component is automatically addressed. The Task Force is therefore of the opinion that this request by the Ad-hoc Working Group has been addressed in the calculations for the funding requirement for the CFC consumption sector presented above.

***CFCs-Price Increase.*** An increase in the price of CFCs -while keeping the price of alternatives- will have an impact on the incremental operating costs and via these costs, on the total funding required for a project approval. The Task Force had to study this aspect through analysis of investment projects.

On the basis of a 3% and a 7% increase in the price for CFC chemicals per year, the reduction in the operational costs of alternatives has been determined. It concerns the use of CFCs for the polyurethane foam sub-sector, as well as for the domestic and commercial refrigeration, with or without foams. In the case of a 3% increase per year, the decreases in the funding required were calculated between 0.15% and 1.74% for refrigeration, and around 3.25% for foam projects, which yields the range 1.70% ± 1.55%. A 7% average price increase would decrease the funding requirement between 0.35% and 4.15% for several types of refrigeration projects, and 7.78% for foam projects. This results in a total decrease of funding required of 4.07% ± 3.71%.

***MB-larger 2000 consumption.*** If the MB consumption in 2000 would have been 10,200 ODP-tonnes globally, the total funding requirement would be an estimated \$71.8 million. Instead, it was US\$64.9 million as calculated in the April 2002 TEAP Report /RTF02/. Both figures were based on the geometric mean of the cost-effectiveness values, being US\$18 per ODP-kg as in the April

2002 TEAP Report /RTF02/. This excludes agency support costs at an assumed value of 11% of the project costs.

***Cost-effectiveness (CE) levels for methyl bromide projects.*** The cost-effectiveness of MB investment and phase-out projects approved by the Executive Committee by August 2002 varies from US\$6.71 to US\$89.9 per ODP-kg. Most projects lie in the range of about US\$10 to US\$36 per ODP-kg. The average CE of projects is US\$24.3 per ODP-kg calculated per project and US\$14.1 calculated on total tonnage. The higher CE values are associated with small projects, the tobacco (soil) sector and the post-harvest sector. Although there will be several large size projects involving a large amount of tonnes, the majority of projects in the future will be relatively small projects, phasing out less than 50 ODP-tonnes each. Approved projects that phase-out less than 50 ODP-tonnes have CE values ranging from US\$15.9 to US\$89.9 per ODP-kg. The average of small projects is US\$37.5 per ODP-kg calculated per project and US\$30.1 calculated on total tonnage. The latter is almost twice the average of all MB phase-out projects (US\$14.1 per ODP-kg). The averages may be expected to decrease over the next few years as more experience is gained and if future small projects within a region could be clustered to form larger projects. Using the averages of US\$24.3 and US\$14.1 per ODP-kg, the total funding requirement would be US\$83,483,817 and US\$53,363,217, respectively. This compares with a total funding requirement estimate calculated on the geometric mean of CE values (US\$18.0 per ODP-kg) of US\$64,879,917, as described in the April 2002 TEAP Replenishment Task Force Report.

***MB price increases or decreases.*** At the global level there is currently a substantial over supply of MB, which means there is no pressure for prices to rise in Article 5(1) countries. Significant price rises are not expected until after the 20% reduction in 2005. For this analysis, the effect of MB price changes of +3%, +7%, -3% and -7% was calculated on the total project cost of a sample of approved investment projects (while prices of alternatives are assumed constant). The results indicated that a price change of +3% would reduce project costs by about 0.9% while a price change of +7% would reduce costs by about 2.1%. The same figures are valid for price decreases.

***MB-50% reduction from 2010.*** A linear MB reduction between the 20% reduction step in 2005 and a 50% reduction in 2010 would mean an average reduction rate of 6% per annum. Based on the assumptions outlined in the April 2002 Report, it was estimated that 342 ODP-tonnes would need to be funded in the 2003-2005 triennium (i.e., 2 years times 6% of 3,326 ODP tonnes, minus 57 ODP tonnes for MB reductions after 2005 from approved projects). This scenario indicates a funding requirement of US\$51.5, US\$62.5, or US\$80.3 million using CE values of US\$14.1, US\$18.0 and US\$24.3 per ODP-kg, respectively.

***MB-Ratification of the Copenhagen Amendment.*** Eleven Article 5(1) countries that have reported MB consumption have not yet ratified the Amendment (by 5



September 2002). If none of these countries ratify before the end of 2005, the funding requirement would be US\$39.8, US\$47.5 or US\$60.0 million, assuming cost effectiveness values of US\$14.1, US\$18.0 and US\$24.3 per ODP-kg, respectively. However, this scenario is unlikely since some countries have already stated their intention to ratify. These values above can be compared to the values calculated for the assumption that all countries would ratify Copenhagen (the April 2002 TEAP Replenishment Task Force Report assumption), i.e., for a CE value of US\$18 per ODP-kg the funding requirement would be US\$64.9 million, US\$17.4 million more than in the case of no further ratifications.

***CTC-Analysis of Data on a Country-by-Country Basis.*** As of 15 September 2002, further specific information had only been received from Cuba, Mexico and Romania. These countries mentioned that their total CTC consumption was for feedstock and other non-process agent uses, which excludes their consumption from further considerations. The above implies that the Task Force has not been able to add further information on CTC consumption for process agent uses (according to Decision X/14) in this supplementary report.

There is one source of information for the use of CTC in the process agent sector in China /SEPA02/. This report separates out CTC uses at a level of about 3,594 ODP tonnes for process agent uses according to Decision X/14. However, the Task Force has not received any formal confirmation regarding this figure from the Chinese government, and is therefore not able to conduct further analysis, given the description of the work to be carried out in the Ad-hoc Working group report.

***CTC-Funding Variation.*** The funding calculated in the April 2002 Report for CTC amounted to US\$49.708 million. In this Supplementary Report a funding requirement of US\$45.876 million was determined under the assumption that no funding would be required for reduction steps after the year 2005 (towards a next Montreal Protocol reduction step). A 30% variation would imply that the funding requirement for CTC, including agency support costs, would be in the ranges given below:

Funding requirement April 2002 Report: US\$37.93–US\$70.44 million  
Supplement to the April 2002 Report: US\$35.00–US\$65.00 million.

### **S.3 Sensitivity Analyses Production Sector**

***CFCs.*** In the April 2002 Replenishment Report the Task Force derived an amount of US\$9.0 million for the funding requirement for the phase-out of the production sector in the countries Argentina, Mexico and Venezuela. This amount was analysed on the basis of the existing agreements for (a) China and India, and (b) the Democratic People's Republic of Korea. The average cost effectiveness value for China and India is US\$3.485 per ODP-kg. In the case of the DPR Korea, the production in the years 1999-2000 was highly inefficient, and

the level should have been substantially higher in order to be cost effective. If one would base the funding provided to the DPR Korea on the basis of the latest reported consumption, the cost effectiveness would be US\$17.767 per ODP-kg. However, the years 1995-1997 display a cost effectiveness value of US\$3.425 per ODP-kg, a value not much different compared to the one used in the production agreements for China and India. Based on the latest consumption and cost effectiveness data for China and India, costs for phasing out production in Argentina, Mexico and Venezuela can be determined at a level of US\$11.858 million for the triennium 2003-2005, excluding support costs.

**MB.** There is no experience to date of projects to fund or compensate the reduction in MB production quantities in Article 5(1) countries. Using an assumed cost effectiveness of US\$3 - US\$5 per ODP-kg, the funding requirement for phasing out 20% of MB production by 2005 would be in the range US\$1.383- US\$2.305 million.

#### **S.4 Sensitivity Analyses for Non-investment Activities**

**CP.** In the April 2002 Report /RTF02/ the funding requirement for the preparation of Country Programmes or Country Programme Updates was determined as US\$1.20 million for the triennium 2003-2005. A plus or minus 20% variation in the funding requirement would yield the range of US\$0.96 million - US\$1.44 million for the preparation of Country Programmes or Country Programme Updates.

**Operating Costs ExCom and MLF Secretariat.** In the April 2002 Report /RTF02/ the funding requirement for the operating costs of the Executive Committee and the MLF Secretariat were determined as US\$9.91 million for the triennium 2003-2005. A plus or minus 15% variation in the funding requirement would yield the range of US\$8.42 million - US\$11.40 million for these costs of the Executive Committee and the MLF Secretariat.

**IS.** In the April 2002 Report /RTF02/ the funding requirement for Institutional Strengthening of all Article 5(1) countries was determined to be US\$18.17 million excluding the 13% agency support costs (US\$2.362 million). The funding requirement for IS was changed by an agreement by the Executive Committee (furthermore, agency support costs do not apply to UNEP). It now concerns the amount of US\$21.021 million. UNEP's part in the Institutional Strengthening projects amounts to US\$8.362 million, the part of all other agencies amounts to US\$12.659 million (the non-LVC part). The agency support costs (not applicable to UNEP) amount to US\$1.646 million, which is 13% of the funding requirement for institutional strengthening by all agencies excluding UNEP.

**Agency Support Costs.** An analysis of a plus or minus 10% variation in the administrative costs of the implementing agencies was performed. This analysis has been made for (a) CFCs, for (b) CFCs and all other ODS, and for non-

investment and other activities. In the case of the funding requirement for the CFC consumption sector, as determined in this Supplementary Report, the agency support costs amount to US\$20.177 million. A plus or minus 10% variation in the agency support costs would imply a plus or minus US\$2.02 million variation in the support costs.

The total amount calculated as agency support costs amounts to US\$47.922 million minus US\$1.759 million for support costs (to be subtracted because this is related to the decrease in funding for non-LVCs for non-investment activities scaled at US\$12.1 per ODP-kg). A variation of plus or minus 10% would then result in support costs between US\$41.547 and US\$50.779 million.

## S.5 Total Funding Requirement

<b>Replenishment Cost Components:</b>	<b>US\$ Million</b>
CFC Consumption Sector Projects	209.5
Chillers, investments for starting revolving funds	5.0
CTC/ TCA Consumption Sector Projects	58.1
MB Consumption Sector Projects	64.9
Investments: Production Sector	87.1
Non-investment Activities; Supporting Activities	74.4
Administrative costs of Implementing Agencies	47.9
Project Preparation Cost	9.3
MLF Secretariat/ Executive Committee Operational Costs	9.9
Non-investment Activity Value to be Subtracted	-18.4
Investments: MB Production Sector 20% Phase-out	1.8
<b>Total</b>	<b>549.6</b>

Several components of the total funding requirement have changed since the publication of the April 2002 Replenishment Report. Changes particularly occurred in the investment projects for the CFC consumption sector, in the funding requirement for the production phase-out, in the Institutional Strengthening project costs, in agency support costs for some parts and in the deduction of a certain amount of funding for non-investment activities in non-LVC countries.

One should also take into account the funding for the phase-out of 20% of the MB production, as indicated by the Ad-hoc Working Group, determined to be US\$1.844 ± 0.461 million. The sum then yields an updated value for the total funding requirement for the triennium 2003-2005.

Taking into account the uncertainty in the funding for the CFC consumption sector of US\$19.12 million (including support costs), the total funding requirement can be determined as **US\$549.6 ± 19.1 million**. This implies that the total funding requirement is in the range **US\$530.5 – US\$568.7 million**.



## **1. Updating of the Report of the TEAP Replenishment Task Force**

The Ad-hoc Working Group on Replenishment requested the TEAP Replenishment Task Force to update the analysis of the CFC consumption sector, while taking into account all decisions of the 36th and 37th Executive Committee meetings. A request was also made to separate out and specify the funding amounts for the linear reductions for all substances for the period after 2005.

### **1.1 Update of the analysis of the CFC consumption sector**

In order to study the impact of all agreed National Phase-out Plans and National Sector Phase-out Plans, the Task Force decided to conduct a completely new analysis of the funding requirement for the replenishment of the Multilateral Fund during 2003-2005 required by the CFC consumption sector.

This analysis was conducted because the April 2002 Report was drafted prior to the Plans agreed at the 36th and 37th meeting. The determination of the average costs of a National Phase-out Plan versus the historic project by project approach can be determined more accurately now since more information has become available. The study used a time dependent analysis with implementation lags for separate projects as given in Annex 5 of the April 2002 Report /RTF02/. The results are based on:

- The 2000 reported CFC consumption for separate countries in categories 1 and 2, as well as the aggregated consumption for the countries in category 3, countries which have no National Phase-out Plans;
- All agreed National Phase-out and National Sector Phase-out Plans;
- Investment projects that have been implemented (completion report available) taking into account the year of approval;
- Investment projects that were approved before January 2002 (between 1994 and December 2001) where so far no completion has been reported. All these projects are assumed to be completed (in the model) between the end of 2002 and the end of 2005, in this way contributing to possible 2005 compliance;
- Investment projects already approved in 2002 (at the 36th and 37th Executive Committee meeting) and expected to be approved at the 38th Executive Committee meeting (according to the Business Plan 2002);
- Separate consideration of the refrigeration manufacturing and the servicing sector for the countries in category 1 and 2 and for the group of countries in category 3. This implies that the cost effectiveness values as given earlier /RTF02/ have been applied to the refrigeration manufacturing sector and cost effectiveness values between US\$7.5 and 8.5 were applied to the servicing sector, dependent on the size of the country (lower values for larger countries).

By an accurate analysis of delayed projects the time dependent method analyses the funding requirement for compliance on the basis of consumption eligible for

funding. This analysis could be conducted in a more precise manner than in the earlier study /RTF02/.

The funding requirement was calculated for two cases:

- a. approval of projects just in time, i.e. approval at the moment a reduction is required to remain in compliance with the 85% reduction step in the year 2007, taking into account an implementation lag of two years or more;
- b. approval of projects as early as possible, but still resulting in compliance with the 85% reduction step in the year 2007.

Case (a) results in approvals mainly in 2005 and also in 2004, which implies that reductions will occur in 2006 and 2007, but also in 2008 and 2009, due to the implementation lag. It implies that the funding requirement will be larger than strictly required for compliance by 2007 only. Case (b) assumes approvals mainly in 2003, which will affect a country's CFC consumption in the years 2005-2007 and virtually not after 2007.

The funding requirement is then determined as the average of case (a) and case (b) since it should be assumed that the funding profile over the period 2003-2005 will be more or less flat. In this way the implementation capacity of the implementing agencies is used in an effective manner and the contributions by non-Article 5(1) countries can be evenly distributed over the triennium 2003-2005.

*Table 1-1 Amounts (in US\$ million) determined as required for the funding of CFC projects in 2003-2005 according to the spreadsheet analysis for (a) funding just in time, and for (b) funding at the beginning of the triennium. The average value, which is assumed to yield a smooth funding profile is also given. Results do not include the values agreed for National Phase-out and National Sector Phase-out Plans.*

<b>Investments (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>Analysis Case (a)</b>	19.012	108.446	32.655	0	0	<b>160.112</b>
<b>Analysis Case (b)</b>	12.016	86.029	21.536	0	0	<b>119.581</b>
<b>Average</b>	15.514	97.238	27.096	0	0	<b>139.847</b>

The results of the funding requirement as calculated for the countries in categories 1, 2 and 3 are given in Table 1-1. The results do not contain the countries that have been addressed via agreed Phase-out Plans (China, Brazil, Malaysia, Thailand, Turkey, Bahamas and Jamaica).

The results do contain the countries that have agreed Sectoral Phase-out Plans, i.e., for those sub-sectors that have not been addressed in the Sectoral Phase-out Plans.

The amount of CFCs involved in the Foam Sector Phase-out Plan and the Refrigeration Sector Phase-out Plan for India and Indonesia, respectively, and the RMP-Servicing Sector Phase-out Plan for Algeria have been deducted from the reported consumption. In this way the consumption that has not been addressed forms the basis for the results for these two countries in Table 1-1. As can be seen in Table 1-1, the total average funding requirement amounts to US\$139.847 million.

The funding requirement calculated is lower than in the April 2002 Report because:

- ❑ Projects that were approved and not implemented (even projects with long delays) could be accurately inserted in a later stage to yield reductions that contribute to the 2005 reduction step. The effects of these reductions could only be partially estimated in the April 2002 Report /RTF02/
- ❑ Phase-out Plans have been approved at the 36th and 37th Executive Committee Meeting, which did not have to be taken into account anymore in the project by project approach.

If an accurate comparison of a National Phase-out Plan and the historic project-by-project approach has to be made, a number of factors play a role. It has been possible to study these factors in a more accurate way than in the earlier April 2002 Replenishment Report /RTF02/:

- National (and National Sector-) Phase-out Plans show a certain funding profile. The amount of funding required during the first three years (and slightly more than three years for Malaysia and Thailand) is always larger than the funding for the period that remains. An average of 76% can be determined as the funding required during the first years.
- In the case of historic funding, i.e. the average of cases (a) and (b), see Table 1-1, the funding during the triennium 2003-2005 will be larger than during later years (after 2005). For a number of countries the funding during 2003-2005 has been compared to the total funding required for the phase-out (via extrapolated calculations). Also here an average value of 76% can be derived for the funding during the 2003-2005 triennium compared to the total amount.
- The total funding for a National Phase-out Plan can be compared to the total funding required for a country following the historic approach. With the latest data (made available by the Multilateral Fund Secretariat) for project implementation during the years before 2001/2002 and the revised calculations for the funding requirement, taking into account cost effectiveness values for refrigeration servicing plans etc., a ratio can be determined. Values between 0.58 and 0.82 have been calculated for the ration between the funding requirement of a National Phase-out Plan and for the historic approach; in both cases it concerns the total funding requirement. The average costs for a National Phase-out Plan were determined at 68.1% of the costs for a phase-out according to the historic approach.

Both methods, the National Phase-out Plans and the historic approach with a smooth funding profile yield the situation that about 76% of the cost is normally spent in the first years (the 2003-2005 triennium for the historic approach). This implies that the costs for a National Phase-out Plan for a certain country can directly be determined by the application of the average factor of 0.681.

Table 1-2 gives the results for the historic approach (smooth funding profile), for the case where all countries adopt National Phase-out Plans, for the case where a large percentage of countries adopt National Phase-out Plans, and the average between the historic approach and the case where a large percentage of countries adopt National Phase-out Plans.

As given in the earlier Report /RTF02/, it is the Task Force's best estimate that

- 100% of the countries in Category 1;
- 50% of the countries in Category 2 (representing about 90% of the entire consumption of these countries); and
- 30% of the countries' consumption in Category 3 (representing 60% of the entire consumption of these countries)

will at short notice have National Phase-out Plans or a combination of Sectoral Phase-out Plans including the total refrigeration sector. These values have been used in the calculation of the results given in Table 1-2.

The average value equals US\$120.822 million. The same considerations can be applied as in the April 2002 Report (i.e. the determination of a central value and an uncertainty range for the funding requirement). This is due to the fact that the Task Force cannot accurately estimate how many more National Phase-out Plans will be approved at short notice.

The funding requirement therefore is  $US\$120.822 \pm US\$19.026$  million, or rather the funding requirement for projects and plans still to be approved lies in the range US\$101.8-139.8 million. This excludes all obligations from already agreed National Phase-out or Sectoral Phase-out Plans.



*Table 1-2 Amounts (in US\$ million) determined as (a) required for the funding of CFC projects in 2003-2005 for the historic approach with a smooth funding profile, (b) for the assumption that all countries will have National Phase-out Plans at short notice, and (c) for the assumption that a significant number of countries will have National Phase-out Plans at short notice, representing the vast majority of the consumption.*

<b>Investments (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>Historic approach (aver. Table 1-1)</b>	15.514	97.238	27.096	0	0	<b>139.847</b>
<b>All NPP Plans (factor 0.681)</b>	10.565	66.219	18.452	0	0	<b>95.236</b>
<b>Large number of NPP Plans)</b>	10.565	69.321	21.910	0	0	<b>101.796</b>
<b>Average of historic and large number NPP Plans</b>	13.040	83.280	24.503	0	0	<b>120.822</b>

It should be clearly mentioned here that the funding required for the CFC consumption sector in the triennium 2003-2005, on average, is equal to about 76% of the total funding required for phase-out-- both for the historic approach and for National Plans. The funding requirement for the period 2006-2008 should be substantially smaller. This can only be stated on the basis of existing agreed Phase-out Plans and extrapolations of calculations following the historic approach. It will very much depend on the starting date of new Plans (whether in 2003, 2004 or 2005) and on which percentage of the funding required for the triennium 2003-2005 would apply to the triennium 2006-2008. The Task Force is not able to make any further statements here.

*Table 1-3 Amounts (in US\$ million) determined as required for the funding of CFC projects in 2003-2005 for the historic approach with a smooth funding profile, as well as for National Phase-out and National Sector Plans. From these values a total per category of countries can be derived, as well as the total funding requirement for the CFC consumption sector.*

<b>Investments (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>Historic approach (aver. Table 1-1)</b>	15.514	97.238	27.096	0	0	139.847
<b>All NPP Plans (factor 0.681)</b>	10.565	66.219	18.452	0	0	95.236
<b>Large number of NPP Plans)</b>	10.565	69.321	21.910	0	0	101.796
<b>Average (uncertainty)</b>	13.040	83.280	24.503	0	0	<b>120.822 (19.026)</b>
<b>China</b> PUR 25.126 Tobacco 5.100 Solvents 10.800 Remain* 12.002	53.028					<b>53.028</b>
<b>Brazil</b>	11.690					<b>11.690</b>
<b>Malaysia</b>		4.765				<b>4.765</b>
<b>Thailand</b>	6.550					<b>6.550</b>
<b>Turkey</b>		2.500				<b>2.500</b>
<b>Bahamas</b>					0.320	<b>0.320</b>
<b>Jamaica</b>					0.175	<b>0.175</b>
<b>Servicing Algeria, RMP</b>		1.225				<b>1.225</b>
<b>India, PUR</b>	3.700					<b>3.700</b>
<b>Indonesia, Refr</b>	4.712					<b>4.712</b>
<b>TOTAL (Uncertainty)</b>	92.719	91.770	24.503		0.495	<b>209.487 (19.026)</b>

\* This is the remaining consumption issue, according to Decision 35/48, and funding of part of it as described in the April 2002 Report, section 4.4 /RTF02/.

*Table 1-4 Amounts (in US\$ million) determined for the agency support costs required for the funding of CFC projects in 2003-2005 for the historic approach with a smooth funding profile, as well as for National Phase-out and National Sector Plans, as given in Table 1-3. From these values a total per category of countries can be derived, as well as the total agency support costs for the CFC consumption sector.*

<b>Support Costs (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>Historic approach (aver. Table 1-1)</b>	1.707	10.696	2.981	0	0	15.384
<b>All NPP Plans (factor 0.681)</b>	0.866	5.430	1.513	0	0	7.809
<b>Large number of NPP Plans)</b>	0.866	5.957	2.100	0	0	8.923
<b>Average (uncertainty)</b>	1.286	8.327	2.540	0	0	<b>12.153 (1.914)</b>
<b>China</b> PUR 2.205 Tobacco 0.400 Solvents 1.080 Remain 1.200	4.885					<b>4.885</b>
<b>Brazil</b>	1.023					<b>1.023</b>
<b>Malaysia</b>		0.391				<b>0.391</b>
<b>Thailand</b>	0.537					<b>0.537</b>
<b>Turkey</b>		0.225				<b>0.225</b>
<b>Bahamas</b>					0.042	<b>0.042</b>
<b>Jamaica</b>					0.023	<b>0.023</b>
<b>Servicing Algeria, RMP</b>		0.155				<b>0.155</b>
<b>India, PUR</b>	0.325					<b>0.325</b>
<b>Indonesia, Refr</b>	0.418					<b>0.418</b>
<b>TOTAL (Uncertainty)</b>	8.475	9.098	2.540		0.064	<b>20.177 (1.914)</b>

Table 1-3 presents a total of US\$209.487 million for the CFC consumption sector, if all agreements are taken into account. Taking into account the

uncertainty of US\$19.026, it implies that the total funding requirement for CFC consumption projects lies in the range US\$190.5-228.5 million.

Table 1-4 presents a total of US\$20.177 million for the agency support costs for the CFC consumption sector, if all agreements are taken into account. Taking into account the uncertainty of US\$1.914 million, it implies that the total funding requirement for support costs for CFC consumption projects lies in the range US\$18.3-22.1 million.

The total funding requirement, including the agency support costs, for the CFC consumption sector for the period 2003-2005 can then be calculated from the data in Tables 1-3 and 1-4 as **US\$229.66 ± 19.12 million**.

## **1.2 Specification of the funding amounts for the linear reductions for all substances after the year 2005**

In order to determine the funding requirement for intermediate reductions towards a next compliance step, the Task Force added funding in the April 2002 Report /RTF02/ for the period after 2005-- mostly funding for projects through the year 2007. It could, however, be assumed that once the compliance step in the year 2005 has been achieved, no funding would be required until 2009 or 2010 when the next compliance step is prescribed.

It should, however, be emphasised that such an approach may lead to non-compliance, if funding is not started early enough, e.g. 4 years before the next compliance steps in 2010 (e.g. for CTC and TCA). It would imply that no funding would be required in the triennium 2003-2005, and that the necessary funding for intermediate steps can be shifted to the next triennium 2006-2008.

### **1.2.1 CFC**

Due to the fact that there is an implementation lag the approvals for the CFC consumption sector on a project-by project basis require funding up to US\$139.847 million (see Tables above). The high value is for the case that all projects will be on a project by project basis, which is highly unlikely with the National Phase-out and Sector Phase-out Plans increasing. It implies that a small amount of the funding for 2003 will concern project implementation after 2007, a somewhat larger amount of the funding for 2004, and an even larger amount of the funding for the year 2005. It is estimated that 20% of the funding requirement for project approvals for projects on a project by project basis would concern the period after 2007, which could be US\$28.72 million at maximum.

However, with the amount of national approaches in total projects increasing, it is estimated that only one third of this funding would apply, i.e. US\$9,20 million would result in reductions after the year 2007, and this amount would therefore not contribute to the 85% reduction step in the year 2007.

On the other hand, if one applies a smooth funding profile (taking into account the implementing agencies' capacities, and the annual contributions to the Multilateral Fund) it is unavoidable to contribute to some reductions after 2007. Only if all funding for historic (project by project) approvals would be disbursed in the year 2003 and the remaining funding would be disbursed for National Plans in the years 2004 and 2005, this can be avoided. The Task Force is unable to judge whether a three year business planning could result in such an approach.

### 1.2.2 CTC

On the basis of the calculations made in the April 2002 Replenishment Report /RTF02/, a certain amount of CTC funding contributes to reductions after the year 2005 (i.e. the total amount calculated in the April 2002 Report was US\$49.708 million, with agency support costs at US\$4.474 million).

A calculation of the amount of funding required for the 85% reduction step in CTC consumption in the year 2005 only yields 5705 ODP tonnes to be phased out in the process agent sector and 1420 ODP tonnes in the cleaning agent sector (compared to values of 6195 and 1530 ODP tonnes determined in a first instance /RTF02/). These values are based on the year 2000 assumed consumption of 8,000 ODP tonnes in the process agent sector and 1,800 ODP tonnes in the cleaning agent sector /RTF02/.

The above results in a funding requirements for process agents and solvents of US\$32,400 million and US\$13.476 million, respectively, which equals the total of US\$45.876 million (with agency support costs at US\$4.129 million).

This would imply a reduction in the funding requirement of US\$4.177 million if support costs are included, compared to the value determined in April 2002 /RTF02/.

It should, however, be taken into account that due to the implementation lags, a smooth funding profile of about US\$15 million per year will not result in the 85% reduction by the year 2005. This would even be impossible if all the funding would be provided in the year 2003, assuming an implementation period between 2 and 4 years. Nevertheless, for the strict 85% reduction US\$4.177 million less is needed than the amount derived in the April 2002 Report /RTF02/, in whatever year the 85% reduction occurs. The Task Force cannot judge in how far this can be possible under the Montreal Protocol compliance requirements. It may also be so that the CTC consumption (for uses under Decision X/14) is larger than assumed; this would depend on the availability of precise information on a country by country basis, which was not the case at the time the April 2002 Report was drafted.

### 1.2.3 TCA - methyl chloroform

The calculations made in the April 2002 Replenishment Report /RTF02/ point out that a certain amount of TCA funding contributes to reductions after the year 2005 (i.e. the total amount calculated in the April 2002 Report was US\$3.080 million, with agency support costs at US\$0.37 million).

A calculation of the amount of funding required for the 30% reduction step in TCA consumption in the year 2005 yields 66.7 ODP tonnes to be phased out (compared to the earlier value of 160 ODP tonnes). This value is based on the global consumption baseline of 1330 ODP tonnes, or 583.3 ODP tonnes if the consumption in China is excluded (addressed in a National Sector Plan) /RTF02/.

The above leads to the funding requirement for TCA for the period 2003-2005 for 30% reduction of US\$1.284 million (with agency support costs at US\$0.154 million).

This would imply a reduction in the funding requirement of US\$2.012 million if support costs are included.

It should, however, be taken into account that due to the implementation lags, a smooth funding profile of about US\$0.4 million per year will not result in the reduction of 30% by the year 2005. This would even be impossible if all the funding were provided in the year 2003, assuming an implementation period between 2 and 4 years. Nevertheless, for the strict 30% reduction US\$2.012 million less is needed than the amount derived in the April 2002 Report /RTF02/, in whatever year the 30% reduction then occurs. The Task Force cannot judge in how far this can be allowed under the Montreal Protocol compliance schedules.

### 1.2.4 Methyl Bromide

Calculations made in the April 2002 Replenishment Report /RTF02/ point out that a certain amount of MB funding contributes to reductions after the year 2005 (i.e. the total amount calculated in the April 2002 Report was US\$8.55 million, with agency support costs at US\$0.94 million).

Taking into account that no further reduction steps in the period 2006-2010 have been decided, one could depart from the assumption that funding for reductions after the year 2005 will not be required during the triennium 2003-2005. This would result in a reduction of the funding requirement of US\$9.49 million if agency support costs are included.

The April 2002 Replenishment Report mentions that US\$17.4 million will be needed in the triennium for proposed investment projects and that about US\$

27.2 million will be needed to reach the freeze and the 20% reduction step (these values have been calculated on a country by country basis). In fact, the freeze year has passed once the triennium 2003-2005 has started, and a number of countries will therefore be in non-compliance. It should also be taken into account that due to the implementation lags, a smooth funding profile of about US\$9.1 million per year (for freeze and 20% reduction) will not result in the 20% reduction in the year 2005. This would even be impossible if all the funding would be provided in the year 2003, assuming an implementation period between 2 and 6 years. Nevertheless, for the strict 20% reduction US\$9.49 million less is needed than the amount derived in the April 2002 Report /RTF02/, in whatever year the 20% reduction then occurs. The Task Force cannot judge in how far this is allowed under the Montreal Protocol compliance schedules.

## 2. Sensitivity Analyses Consumption Sector

The meeting of the Ad-hoc Working Group on Replenishment requested the TEAP Replenishment Task Force to carry out sensitivity analyses for (a) the CFC, (b) the methyl bromide, and (c) the CTC consumption sectors. All sub-items requested are dealt with below, except the sensitivity analysis of the administrative costs of the agencies, which is presented at the end of this report.

### 2.1 CFC consumption sector

#### 2.1.1 National Phase-out Plans

It has been requested to study the effect of a plus or minus 20% variation in the cost-effectiveness values for National Phase-out Plans.

In the above study, an average of 68.1% of the funding requirement costs for historic project by project approvals was calculated for the average National Phase-out Plan so far agreed by the Executive Committee.

*Table 2-1 Amounts (in US\$ million) determined as required for the funding of National Phase-out Plans, taking into account the average of 68.1% of the funding requirement for approvals on a project by project basis.*

<b>Investments (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>All NPP Plans (factor 0.681)</b>	10.565	66.219	18.452	0	0	<b>95.236</b>
<b>All NPP Plans (factor 0.681) * 80%</b>	8.452	52.975	14.762	0	0	<b>76.189</b>
<b>All NPP Plans (factor 0.681) * 120%</b>	12.678	79.463	22.142	0	0	<b>114.283</b>

A 20% variation in the average costs for National Phase-out Plans results in a variation of US\$19.047 million on the basis of a three-year period, more specifically the triennium 2003-2005.

The impact of a plus or minus 20% variation of the National Phase-out Plan has been calculated on the basis of the results derived above for the CFC consumption sector.

Introducing National Phase-out Plans at 80% of the average cost, and combining them with a certain amount of approvals on a project by project basis (see Table 2-2) results in a funding requirement of averaged US\$114.464 million with an uncertainty of US\$25.38 million. This can be compared to the value earlier derived of US\$120.822 ± 19.026 million.



*Table 2-2 Amounts (in US\$ million) determined as required for the funding of CFC projects in 2003-2005 for the historic approach with a smooth funding profile, for the assumption that a significant number of countries will have National Phase-out Plans at short notice at 80% of the average costs determined, representing the vast majority of the consumption.*

<b>Investments (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>Historic approach (aver. Table 1-1)</b>	15.514	97.238	27.096	0	0	<b>139.847</b>
<b>Large number of NPP Plans (*80%)</b>	11.983	57.401	19.696	0	0	<b>89.080</b>
<b>Average</b>	13.749	77.320	23.396	0	0	<b>114.464</b>

*Table 2-3 Amounts (in US\$ million) determined as required for the funding of CFC projects in 2003-2005 for the historic approach with a smooth funding profile, for the assumption that a significant number of countries will have National Phase-out Plans at short notice at 120% of the average costs determined, representing the vast majority of the consumption.*

<b>Investments (* US\$ million)</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>	<b>Total</b>
<b>Historic approach (aver. Table 1-1)</b>	15.514	97.338	27.096	0	0	<b>139.847</b>
<b>Large number of NPP Plans (*120%)</b>	14.096	81.241	24.124	0	0	<b>119.461</b>
<b>Average</b>	14.805	89.234	25.610	0	0	<b>129.654</b>

Introducing National Phase-out Plans at 120% of the average costs, and combining them with a certain amount of approvals on a project by project basis (see Table 2-3) results in a funding requirement of averaged US\$129.654 million with an uncertainty of US\$10.28 million. This can be compared to the value earlier derived of US\$120.822 ± 19.026 million.

#### 2.1.2 Cost effectiveness variation of RMPs

The April 2002 Report /RTF02/ mentions that, for both LVC and non-LVC countries, US\$8.4 million would be required as funding in the triennium 2003-2005, which figure includes the cost for RMP supplements (50% of the original sum as agreed by the Executive Committee). For the LVC group as well as the

non-LVC group an amount for RMPs of US\$2.7 million has been taken into account.

Increasing or decreasing the cost effectiveness of RMPs for non-LVCs by 20% would result in a variation of US\$540,000 in the funding requirement.

One comment could be made here. The costs for RMPs for non-LVC countries has been estimated (based upon experience) at US\$270,000 per country, which, in fact, relates more to the non-investment component of RMPs for non-LVCs.

Recently, at the 37th Executive Committee meeting, investment components were approved for Algeria and Yemen, at a funding requirement of about US\$1.4 million each. These investment costs have not been considered in the sensitivity analysis for RMPs.

Investment costs for this type of activities have been considered in the CFC analysis (historic approach for country categories 1, 2 and 3) in the April 2002 Report /RTF02/ and in this Supplementary Report. Since the costs for Yemen were approved at the 37th Meeting without a disbursement schedule (funding in the year 2002) the tonnage involved has been subtracted from the calculations following the historic approach. Where it concerns Algeria, the costs (following a disbursement schedule for the years 2003 and 2004) have been separately considered in Tables 1-3 and 1-4 under Sectoral Phase-out Plans.

### 2.1.3 CFC consumption in RMPs or in National Phase-out Plans

The April 2002 Report /RTF02/ gives a list of different funding requirements:

- (a) for a complete historic approach;
- (b) for an approach that takes into account the delays in implementation and uses modified cost effectiveness values for the refrigeration sector (taking into account the servicing sector);
- (c) for an approach that calculates the average between the latter two approaches. In this Supplementary Report, the funding requirement has been calculated for a historic project by project approach in which the cost effectiveness value for the servicing sector has been used as derived from Refrigerant Management Plans (RMPs). This value has been averaged with the average costs for National Phase-out Plans in which the servicing sector component is automatically addressed.

The Task Force is therefore of the opinion that this request by the Ad-hoc Working Group has been addressed in the calculations presented above.

#### 2.1.4 Impact of the increase in the price of CFCs

An increase in the price of CFCs –while the price of alternatives is kept constant– will have an impact on the incremental operating costs and via these costs, on the total funding required for a project approval.

The only way the Task Force could study this aspect was through the analysis of a large number of investment projects.

For refrigeration, the Task Force analysed Sectoral Manufacturing Phase-out Plans, one of them being for Indonesia, which Plan was approved at the 37th Executive Committee Meeting. The percentage of the operating costs in the total costs for this project equals 19%. For other projects studied in the domestic and commercial refrigeration sector the incremental operating cost part varied between 14 and 17%.

It should be mentioned here that in the Indonesia Refrigeration Manufacturing Plan and similar plans the operating costs are only calculated on the basis of the difference in price for the refrigerants, and on the basis of two years, since it concerns the commercial refrigeration sector.

This would then have the consequence that the impact of the increase of the price of the CFCs would be relatively large here, at least when compared to a conventional domestic refrigeration project, where incremental operating costs are calculated for half a year and where the operating costs consist of the differences in price for the refrigerant, the compressor, the dryer, the capillary tube etc.

On the basis of a 3% increase in the price for CFC chemicals per year (3%, 6.09% and 9.27% in three subsequent years), the reduction in the operational costs has been determined. This has also been done for a 7% increase per year (leading to 7%, 14.49% and 22.50 % in three subsequent years). It concerns the use of CFCs for the polyurethane foam, as well as for the refrigeration circuit. Where the reduction in the operational costs is in the order of 3, 6 and 9% (in the case of a 3% increase), the reduction in the total funding for the project is substantially smaller.

In the case of a 3% increase per year, average decreases in the funding required were calculated at 1.41% (Indonesia), and between 1.63% and 1.74% for other projects. In the case of a 7% increase average decreases calculated were 3.62% (Indonesia) and between 3.88% and 4.15% for other projects, however, all with a polyurethane foam component.

Calculations have also been made for refrigeration projects without a foam component for the domestic and the commercial refrigeration sector. An annual 3% increase in the price of CFC-12 results in a decrease in the funding required for the project of about 0.15% for the domestic sector, with about 0.50% for the

commercial refrigeration sector. An annual increase of 7% in the price of CFC-12 results in a decrease in the funding of 0.35% for the domestic refrigeration sector, with about 1.1% for the commercial refrigeration sector.

For the refrigeration sector (whether domestic or commercial), the impact of the increase in the CFC prices is as follows:

*Annual 3% increase CFC price - decrease project cost 0.95% ± 0.80%.*  
*Annual 7% increase CFC price - decrease project cost 2.25% ± 1.90%.*

Calculations have also been made for a prototype rigid foam insulated sandwich panel project, with conversion from CFC-11 to HCFC-141b, where the difference in US\$ per kg is 0.7. An annual price increase of 3% would result in a 3.25% decrease of the project costs, whereas an annual increase of 7% would result in a 7.78% decrease.

One could average between the refrigeration and the foam sub-sector, which would yield higher values than derived for the refrigeration sub-sector:

*Annual 3% increase CFC price -- decrease project cost 1.70% ± 1.55%.*  
*Annual 7% increase CFC price -- decrease project cost 4.07% ± 3.71%.*

It should be emphasised that the importance of the foam sector will decrease considerably, since the number of projects will decrease due to the fact that the vast majority of foam conversions has been addressed.

Therefore, it would be better for an estimate of a CFC price increase to focus on the percentages derived for the refrigeration sub-sector.

## **2.2 Methyl bromide consumption sector**

This section presents the sensitivity analysis using a variation in various parameters as requested by the Ad-hoc Working Group.

### **2.2.1 The impact of an increase of the 2000 MB consumption to 10,200 ODP tonnes**

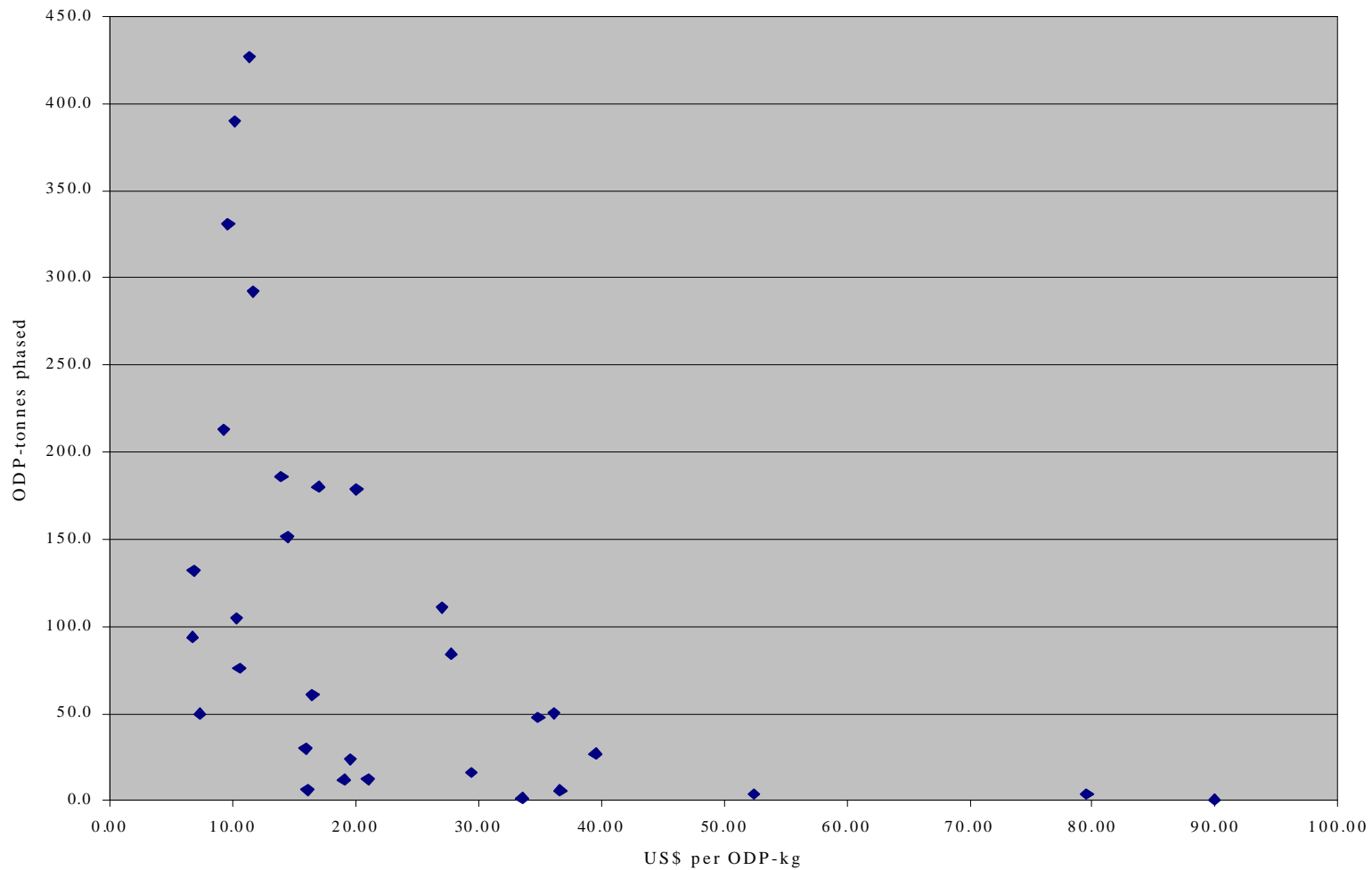
If the MB consumption in 2000 equals 10,200 ODP-tonnes in the Article 5(1) countries, the total funding requirement would be an estimated \$71.8 million (Table 2-4). This is based on a cost-effectiveness value of US\$18 per ODP-kg as assumed in the April 2002 TEAP Report /RTF02/. This excludes agency support costs at an assumed value of 11% of the project costs.

*Table 2-4 Sensitivity analysis: MB consumption of 10,200 ODP-tonnes in 2000*

<b>MB reductions requiring funding in 2003-05</b>	<b>TEAP calculation April 2002 (ODP-tonnes)</b>	<b>Replenishment Determined April 2002 (US \$)</b>	<b>Analysis based on 10,200 ODP-t (ODP-tonnes)</b>	<b>New total replenishment (US \$)</b>
Approved investment projects – tranches in 2003-05	1,351	11,725,917	1,351	11,725,917
Planned investment projects 2002 – tranches in 2003-05 (a)	968	17,424,000	968	17,424,000
Reductions to achieve freeze (b)	1,124	20,232,000	1,343	24,174,000
Reductions to achieve 20% cut (b)	386	6,948,000	461	8,298,000
Reductions due to time lag	475	8,550,000	568	10,224,000
<b>Total</b>	<b>4,304</b>	<b>64,879,917</b>	<b>4,691</b>	<b>71,845,917</b>

(a) This includes MB reductions of at least 563 ODP-t to achieve the freeze and 20% reduction step.

(b) Reductions necessary to meet Protocol limits, after deducting relevant MB reductions by existing projects and investment projects planned for approval in 2002 (as described in TEAP Report April 2002).



**Fig. 2-1** Cost Effectiveness Values for and ODP Tonnes Phased out by 31 Projects approved up to August 2002

2.2.2 Preparation of an alternative analysis on the basis of the arithmetic mean of the cost-effectiveness values of approved projects

The arithmetic mean of the cost-effectiveness values (CE) of the 31 MB phase-out projects approved up to and including August 2002 (see Fig. 2-1) was US\$24.3 per ODP-kg when the mean was calculated per project (i.e., the sum of CE values of all phase-out projects divided by the number of projects). The arithmetic mean calculated on total tonnage (i.e., dividing the total cost of all phase-out projects by total tonnes phased out) is US\$14.1 per ODP-kg. The MLF Secretariat also provided a mean of US\$15.95 where the mean was calculated on total tonnage. Using the averages of US\$24.3 and US\$14.1 per ODP-kg, the total funding requirement would be US\$83,483,817 and US\$53,363,217, respectively. This compares with a total funding requirement estimate calculated on the geometric mean of CE values (US\$18.0 per ODP-kg) of US\$64,879,917, as described in the April 2002 TEAP Replenishment Task Force Report.

However, it should be noted that the mean calculated on total tonnage (US\$14.1) does not take account of the relatively larger funds needed for small MB phase-out projects. Figure A6-1 in Annex A of the April 2002 TEAP Report /RTF02/ maps out the CE values of approved investment projects. It clearly shows that the CE of small projects (i.e., projects that will phase-out less than 50 ODP-tonnes) varies from US\$16 to about US\$90 per ODP-kg, being much higher than the CE values of large projects.

*Table 2-5 Sensitivity analysis: Cost-effectiveness value arithmetic means*

<b>MB reductions requiring funding in 2003-05</b>	<b>MB reductions (ODP-tonnes)</b>	<b>Replenishment based on CE US\$14.1 per ODP-kg (US\$)</b>	<b>Replenishment based on CE US\$24.3 per ODP-kg (US\$)</b>
Approved investment projects – tranches in 2003-05	1,351	11,725,917	11,725,917
Planned investment projects for 2002 – tranches in 2003-05	968	13,648,800	23,522,400
Reductions to achieve freeze	1,124	15,848,400	27,313,200
Reductions to achieve 20% cut	386	5,442,600	9,379,800
Reductions due to time lag	475	6,697,500	11,542,500
<b>Total</b>	<b>4,304</b>	<b>53,363,217</b>	<b>83,483,817</b>

Analysis of all the MB phase-out projects approved to August 2002 showed that projects which phase out less than 50 ODP tonnes have CE values ranging from US\$15.9 to US\$89.9 per ODP-kg. The average of small projects is US\$37.5 per ODP-kg calculated per project and US\$30.1 calculated on total tonnage. The

latter is almost twice the average of all MB phase-out projects (US\$14.1 per ODP-kg).

Although it is likely that there will be several very big projects in the next triennium, the majority of future MB investment projects will be small projects as pointed out by the April 2002 Report. This does not imply that the majority of the tonnes concerned can be found in small projects, however, the largest number of projects will be small projects. Therefore, when calculating the replenishment needs using the arithmetic mean of all phase-out projects, a higher mean than the mean of US\$14.1 (calculated per tonnage) provides a more realistic picture of the funding needs (a value between US\$14.1 and US\$24.3 (the latter value calculated per project)).

- 2.2.3 Implications of possible increases or decreases in the MB price in Article 5(1) Parties over the period of the triennium 2003-2005, while prices of alternatives are considered to remain constant

The price of MB has risen greatly in the USA and certain other non-Article 5(1) countries, due to the 50% reduction step in 2001, stated policies of some MB suppliers and new or increased government imposts. However, at a global level there is a substantial over supply of MB, which means there is no pressure for prices to rise in Article 5(1) countries. Indeed, MB prices have fallen in some Article 5(1) countries, and significant price rises are not expected until after the 20% reduction in 2005. For this analysis, the TEAP Replenishment Task Force calculated the effect of price changes of +3%, +7%, -3% and -7% on the total project cost of a sample of approved investment projects. The results indicated that a price change of +3% would reduce project costs by about 0.9% while a price change of +7% would reduce costs by about 2.1%. The same figures are valid for price decreases.

- 2.2.4 Implications for the funding requirement for the 2003-2005 replenishment if a 50% reduction, compared to the baseline in Article 5(1) countries MB consumption in the year 2010 is assumed

A linear reduction was assumed between the 20% reduction step in 2005 and the 50% reduction step in 2010. This would mean an average reduction rate of 6% per annum (where calculations were made in the April 2002 Report /RTF02/ using 8% per annum). The amount of MB remaining after 2005 was estimated to be 3,326 ODP tonnes, assuming that all anticipated projects will be approved by 2005. There is an implementation of about 2 to 6 years between approvals of MB projects and the completion of MB reductions, where shorter implementation lags hold for smaller projects. These will be occurring more and more in future, next to National Phase-out Plans (currently about 58% of the projects are due to complete their MB reductions in about 5-6 years). Based on the assumptions in the April 2002 Report, it was estimated that 2 times 6% of 3,326-ODP tonnes, i.e., 399 ODP-tonnes, would need to be eliminated. This scenario indicates a



funding requirement of US\$51.5, US\$62.5, or US\$80.3 million in the next triennium, using CE values of US\$14.1, US\$18.0 and US\$24.3 per ODP-kg, respectively. Results are given in Table 2-6 (not including agency support costs assumed at 11%).

The Replenishment Task Force, at this stage, cannot go into further detail. In the near future it may well be that more MB phase-out or Sectoral Phase-out Plans will be approved with a certain funding profile that may substantially change the amount of funding required in the next triennium (dependent, of course, on the disbursement schedule).

*Table 2-6 Sensitivity analysis: 50% reduction in Article 5(1) countries MB consumption in the year 2010*

MB reductions to achieve 50% cut	MB reductions (ODP-t)	Funding requirement based on various cost-effectiveness values (US \$)		
		US\$14.1	US\$18.0	US\$24.3
Approved investment projects – tranches in 2003-05	1,351	11,725,917	11,725,917	11,725,917
Proposed projects	968	13,648,800	17,424,000	23,522,400
Reductions to achieve freeze	1,124	15,848,800	20,232,000	27,313,200
Reductions to achieve 20% cut	386	5,442,600	6,948,000	9,379,800
Reductions to achieve 50% cut	342	4,822,200	6,156,000	8,310,600
<b>Total</b>	<b>4,171</b>	<b>51,487,917</b>	<b>62,485,917</b>	<b>80,251,917</b>

2.2.5 Evaluation of the implications for the funding requirement for the 2003-2005 replenishment, based on different assumptions of the schedule for the ratification of the Copenhagen Amendment by Article 5(1) Parties

Table 2-7 indicates the funding requirement in relation to the status of the ratification of the Copenhagen Amendment. The Article 5(1) countries that have reported MB consumption and have not yet ratified the Amendment are Bosnia & Herzegovina, China, Ethiopia, India, Kyrgyzstan, Libya, Malta, Namibia, Papua New Guinea, Swaziland and Zambia (as of 5 September 2002). The government of China sent an official letter to the Ozone Secretariat in 2001, indicating its intention to ratify by the end of 2002. China's SEPA has been carrying out many activities to promote ratification and is preparing a strategy for the MB phase-out. Several countries are aiming to achieve ratification so it is reasonable to expect that these countries will need MLF assistance for projects in the next triennium.

If no additional countries ratify the Amendment between September 2002 and 2005, the total funding requirement would be reduced to US\$39.1, US\$47.5 or US\$60.0 million, using CE values of US\$14.1, US\$18.0 and US\$24.3, respectively. However, the scenario of no further ratifications seems unlikely. If all MB consuming countries except China ratify the Amendment, the funding requirement would be US\$42.1, US\$50.5 or US\$64.1 million, based on the CE values given above. However, China does intend to ratify the Amendment so this scenario is unlikely. If virtually all MB consuming countries ratify before or in the next triennium (e.g. in 2003 or 2004), the funding requirement would be US\$53.4, US\$64.9 and US\$83.5 million, based on the CE values given above (see also Table 2-7).

Of course, if country ratifications do not take place until the end of the next triennium, the funding requirement for those countries is shifted forward to the next triennium.

*Table 2-7 Sensitivity analysis: status of ratification of Copenhagen Amendment*

Ratification scenarios	MB reductions (ODP-t)	Replenishment requirement based on various cost-effectiveness values (US\$)		
		US\$14.1	US\$18.0	US\$24.3
Ratification by all (TEAP RTF scenario April 2002)	4,304	53,363,217	64,879,917	83,483,817
Ratification by all except China (b)	3,506	42,111,417	50,515,917	64,092,417
Ratification by all except India (c)	4,240	52,460,817	63,727,917	81,928,617
No new ratifications (d)	3,339	39,756,717	47,509,917	60,034,317

- (a) Includes funding for approved projects which account for 1,351 ODP-t (US\$11,725,917)
- (b) TEAP scenario of April 2002 minus an estimated 798.4 ODP-tonnes that China would need to eliminate to achieve the 20% reduction in 2005
- (c) TEAP scenario minus 64 ODP-tonnes that India would need to eliminate to achieve the 20% reduction in 2005. This assumes that India's consumption is not for QPS uses. If it is so, it would not be subject to phase-out or funding.
- (d) TEAP scenario minus 965 ODP-tonnes that China, India, Bosnia & Herzegovina, Ethiopia, Kyrgyzstan, Libya, Malta, Namibia, Papua New Guinea, Swaziland and Zambia would need to eliminate to achieve the 20% reduction in 2005. This scenario assumes that there will be no further ratifications of the Copenhagen Amendment between September 2002 and 2005, which seems rather unrealistic.

## 2.3 Carbon tetrachloride consumption sector

The request by the Ad-hoc Working Group is to investigate the implications for the funding requirement of (a) an analysis of CTC consumption on a country by country basis, in light of further information to be provided by Article 5(1) countries, and (b) the impact of a plus or minus 30% variation in the funding requirement.

### 2.3.1 Analysis of CTC consumption

The meeting report of the Ad-hoc Working Group was dispatched to all Parties in the second half of August 2002. However, the deadline for submitting information was 30 August 2002. The main CTC consuming Article 5(1) countries have been approached by email and other means, requesting them to submit information. As of 15 September 2002, no further specific information had been received from countries, except from Cuba, Mexico and Romania which countries mentioned that their total CTC consumption was for feedstock and other non-process agent uses. This cannot be further taken into account.

The above implies that the Task Force has not been able to add further information on CTC consumption for process agent uses (according to Decision X/14) in this Supplementary Report.

There is one extra source of information for the use of CTC in the process agent sector in China. A report on the consumption for uses according to Decision X/14 had been submitted to the Task Force /SEPA02/ in the beginning of 2002, and this had been mentioned in the April 2002 Task Force Report. Although this report mentions CTC use at a level of about 10,400 ODP tonnes, it also separates out 3,594 ODP tonnes for process agent uses according to Decision X/14 (processes 9 (CS-6), 10/11 (CS7a/b), 16 (CS-12) and process 21 as defined in the TEAP Report /TEAP02/).

However, the Task Force has not received any formal confirmation regarding this figure from the Chinese government, and is therefore not able to conduct further analysis, given the description of the work to be carried out in the Ad-hoc Working group report.

A second source that mentions information on process agents is the UNEP document UNEP/OzL.Pro.13/8, distributed at the Colombo 13th Meeting of the Parties in 2001. It is based on the submission of CTC data by a number of Article 5(1) countries. Excluding Mexico (which country recently reported to not use CTC for process agents but is mentioned as a big consumer (10 k ODP tonnes in the UNEP document) the amount given is 9870 ODP tonnes. The list is not exhaustive since the process agent use in China is lacking, which may also be the case for other countries.

If one would extrapolate the figures from the UNEP document, one could calculate a funding requirement for CTC process agent uses. The fact that 1095 ODP tonnes have been addressed in projects already /RTF02/, results in a remaining consumption of 8,775 ODP tonnes. A reduction of 85% would imply a funding requirement of US\$42,366 million (not including agency support costs).

The only observation the Task Force can make is that the figure derived for the funding requirement for CTC in the April 2002 Report (US\$35.188 million for CTC process agents) is not very much different from the one given above. However, it should be added that the data presented in the UNEP document are not reliable enough, and that data from China are completely lacking, so that no further conclusions can be drawn at all.

This is all the information on this issue that the Replenishment Task Force is able to present.

### 2.3.1 Variation in funding requirement for CTC

The funding calculated in the April 2002 Report for CTC amounted to US\$49.708 million. In this Supplementary Report a funding requirement of US\$45.876 has been determined under the assumption that no funding would be required for reduction steps after the year 2005, towards a next Montreal Protocol reduction step.

In the first case (value from the April 2002 Report), a 30% variation would imply that the funding requirement for CTC would be in the range US\$34.796 million - US\$64.620 million. In the second case the funding requirement would be in the range US\$32.113 million -US\$59.639 million.

If agency support costs would be added it would lead to the ranges:

<i>Funding requirement April 2002 Report:</i>	<i>US\$37.93–US\$ 70.44 million</i>
<i>Ibidem, Supplementary Report:</i>	<i>US\$35.00–US\$ 65.00 million</i>

### 3. Sensitivity Analyses Production Sector

The Ad-hoc Working Group requested sensitivity analysis to the production sector for CFCs and for methyl bromide.

#### 3.1 Production Sector – CFCs

In the April 2002 Replenishment Report the Task Force determined a value for the funding requirement for the phase-out of the production sector in the countries Argentina, Mexico and Venezuela (the latter two countries have a 50% foreign ownership of the existing production facilities). The value determined was US\$9 million, on the basis of assumptions regarding cost effectiveness, profit compensation and the moment when agreements for closure of production would be concluded.

The Ad-hoc Working Group requested the Replenishment Task Force to analyse this amount on the basis of the existing agreements for (a) China and India, and (b) the Democratic People's Republic of Korea.

In the case of China and India, the consumption level considered was more or less the consumption in the year that the agreement was concluded; it was not related to the baseline consumption, i.e., the average over the years 1995-1997.

In the case of China, a cost effectiveness value of US\$3.339 per ODP-kg can be derived, whereas for India this cost effectiveness value equals US\$3.63. The average cost effectiveness value is therefore US\$3.485 per ODP-kg.

In the case of the DPR Korea, the production in the years 1999-2000 was highly inefficient, and the level should have been substantially higher in order to be cost effective. The funding provided to the DPR Korea for the CFC-113 and the CFC-11/12 production was not based on the more or less latest consumption level, and also not on the basis of compensation funds. It was based on the scrap value of the equipment, which is a completely different criterion compared to the China and India agreements.

*Table 3-1 Amounts in ODP tonnes reported by the DPR of Korea as production for the period 1995-2001; it concerns production of CFC-11, -12 and -113 (the latter amounts being 15-20% of the total amount produced). CE values in US\$ per ODP-kg are given on the basis of the different consumption levels in different years.*

DPR Korea	1995	1996	1997	1998	1999	2000
<b>Production</b>	<b>785</b>	<b>250</b>	<b>210</b>	<b>120</b>	<b>110</b>	<b>80</b>
CE-value	1.811				13.697	17.767
<b>Baseline</b>		<b>415</b>				
CE-value		3.425				

If one would base the funding provided to the DPR Korea on the basis of the latest reported consumption, the cost effectiveness would be US\$17.767 per ODP-kg. This is about five times as much as the cost effectiveness value applicable to the Chinese and Indian production. However, if one would go back to the years 1995-1997 for the production level in the DPR Korea and base a cost effectiveness value on this level, the cost effectiveness value would be US\$3.425 per ODP-kg. This value is not much different than the value used in the production agreements for China and India.

Calculations on the basis of the latest reported consumption (i.e., the year 2000) can be performed for the countries Argentina, Mexico and Venezuela. However, in the case of agreements to be concluded, one will also take into account the production level in the year 2001 and, if reported, also the value for the year 2002. The calculations presented here therefore are only a first approach.

On the basis of the latest consumption and the cost effectiveness for China and India, as well as on the basis of the cost effectiveness value for the baseline production of the DPR of Korea, costs for phasing out production in Argentina, Mexico and Venezuela can be determined, which are presented in Table 3-2 below.

*Table 3-2 Amounts (in US\$ million) determined as required for the funding of the CFC production sector phase-out in the countries Argentina, Mexico and Venezuela for the period including the year 2009, and for the triennium 2003-2005, assuming that agreements will be concluded in the beginning of the year 2003..*

Country	Cost effectiveness Value	Amount (*US\$1000) Total	Amount (*US\$1000) Triennium 2003-05
	3.485 (China/India)		
<b>Argentina</b>		10 548	4 521
<b>Mexico*</b>		13 147	5 635
<b>Venezuela*</b>		3 974	1 703
<b>TOTAL</b>		27 669	11 858
	3.425 (DPR of Korea)		
<b>Argentina</b>		10 368	4 494
<b>Mexico*</b>		13 069	5 601
<b>Venezuela*</b>		3 950	1 694
<b>TOTAL</b>		27 387	11 789

Note: Includes 50% foreign ownership for production facilities in Mexico and Venezuela

Since the cost effectiveness values used are only slightly different, it is proposed to use the values derived from the agreements for China and India. This would imply that the funding requirement for a production phase-out in the countries Argentina, Mexico and Venezuela in the triennium 2003-2005 would amount to **US\$11.858 million**. Instead of the estimate of US\$9 million given in the April

Report /RTF02/, this value has been used in the update of the total funding requirement for the triennium 2003-2005.

### **3.2 Production Sector – Methyl Bromide**

The Ad-hoc Working Group had only one request regarding the analysis of the MB production sector.

- 3.2.1 The implications for the funding requirement of the phase-out of 20% of the MB production by 2005, taking into account the likely cost range of US\$3 to US\$5 per ODP-kg.

There is no experience to date of projects to fund or compensate the reduction in MB production quantities in Article 5(1) countries, and the TEAP Replenishment Task Force is not able to provide an estimate at this stage. However, using an assumed cost effectiveness of US\$3 - US\$5 per ODP-kg as suggested by the Ad-hoc Working Group, the funding requirement for phasing out 20% of MB production by 2005 would be in the range US\$1,383,000 – US\$2,305,000.

## **4. Sensitivity Analyses for Non-investment Activities**

The Ad-hoc Working Group requested to conduct two sensitivity analyses for non-investment activities, (a) concerning the preparation and updating of country programmes, and (b) concerning the operating costs of the Executive Committee and the Multilateral Fund Secretariat.

Since the costs for Institutional Strengthening were slightly modified after that the April 2002 Replenishment Task Force Report had been drafted, an extra section is added which gives an update on the costs for Institutional Strengthening for the triennium 2003-2005.

### **4.1 Country Programmes**

In the April 2002 Report /RTF02/ the funding requirement for the preparation of Country Programmes or Country Programme Updates was determined as US\$1.20 million for the triennium 2003-2005.

A plus or minus 20% variation in the funding requirement would yield the range of US\$0.96 million - US\$1.44 million for the preparation of Country Programmes or Country Programme Updates.

### **4.2 Operating Costs of the Executive Committee and the MLF Secretariat**

In the April 2002 Report /RTF02/ the funding requirement for the operating costs of the Executive Committee and the MLF secretariat were determined as US\$9.91 million for the triennium 2003-2005.

A plus or minus 15% variation in the funding requirement would yield the range of US\$8.42 million - US\$11.40 million for the operating costs of the Executive Committee and the MLF Secretariat.

### **4.3 Institutional Strengthening – Funding Requirement 2003-2005**

In the April 2002 Report /RTF02/ the funding requirement for Institutional Strengthening of all Article 5(1) countries was determined as US\$18.17 million excluding the 13% agency support costs (US\$2.362 million).

However, agency support costs do not apply to UNEP's Institutional Strengthening projects; furthermore, the list of expenditures was slightly modified since the first quarter of 2002.



It concerns the following:

*Institutional Strengthening 2003:* US\$ 6.277 million

*Institutional Strengthening 2004:* US\$ 6.907 million

*Institutional Strengthening 2005:* US\$ 7.837 million

*Total* US\$21.021 million

Note: this is roughly US\$3 million more than considered in the April 2002 Report

UNEP's part in the Institutional Strengthening projects amounts to US\$8.362 million, the part of all other agencies amounts to US\$12.659 million.

The agency support costs (excluding UNEP) amount to US\$1.646 million (US\$588,279 in 2003, US\$370,983 in 2004 and US\$686,446 in 2005), which is 13% of the funding requirement for institutional strengthening by all agencies excluding UNEP.

#### 4.4 Agency Support Costs

In the Section "Consumption Sector – CFCs" the Ad-hoc Working Group requested an analysis of a plus or minus 10% variation in the administrative costs of the implementing agencies.

In chapter 5 the Task Force presents an update of the total funding requirement. On the basis of the figures presented in chapter 5 an analysis of a variation in the agency support costs will be made for (a) CFCs, and for (b) CFCs and all other ODS, as well as for non-investment and other activities.

In the case of the CFC consumption sector funding requirement, as determined in this Supplementary Report, the agency support costs amount to US\$20.177 million. A plus or minus 10% variation in the agency support costs would imply a plus or minus US\$2.02 million variation in the agency support costs.

The total amount calculated as agency support costs amounts to US\$47.922 million minus US\$1.759 million for support costs (to be subtracted because this is related to the decrease in funding for non-LVCs for non-investment activities scaled at US\$12.1 per ODP-kg). The total would therefore be US\$46.163 million.

A variation of plus or minus 10% in the agency support costs would then result in total support costs varying from US\$41.547 to US\$50.779 million.

This mathematical exercise can be done, but it cannot be simply applied to the total funding requirement and a change in values. This is due that many National and Sectoral Phase-out Plans, as well as Production Phase-out Plans and certain non-investment activities have been agreed at an agreed agency support cost.

For a precise analysis one would have to separate out all these agreed plans and calculate the influence of a plus or minus 10% variation in the agency support costs of the remaining projects. Whereas the variation mentioned above amounts to a plus or minus US\$4.62 million variation in the agency support costs, it is estimated that this 10% variation would result in less than US\$2 million variation in the agency support costs, if all agreed plans are taken into proper account.

## 5. Total Funding Requirement

The Task Force is of the opinion that it is useful to present an updated table of the total funding requirement, since several parts have changed since the publication of the April 2002 Replenishment Report (TEAP Progress Report, Volume 2). In principle the table is identical to the one in the April 2002 Report, except for those parts where the funding requirement has definitely changed.

Changes particularly occur in the investment projects for the consumption sector related to CFCs, in the funding requirement for production phase-out, in the Institutional Strengthening project costs, in agency support costs for some parts and in the deduction of a certain amount of funding for non-investment activities in non-LVC countries. This then yields an updated value for the funding requirement for the triennium 2003-2005.

In a second instance the funding requirement for reductions after the year 2005 for the substances CTC, TCA and methyl bromide can be calculated and could be deducted from the total funding requirement determined. Although this has not been done, it would represent a further decrease in the total funding requirement.

Type of projects	Investment (US\$ million)	Agency support cost (US\$million)	Subtotal (US\$ million)
<b>a. Investment projects consumption sector</b>			
• Contr. to CFC phase-out (as of 2005), incl. China	209.487	20.177	
• Chillers, start rev. funds	5.000	0.675	
• Contr. to ODS phase-out, CTC	49.708	4.474	
• Contr. to ODS phase-out, TCA	3.080	0.370	
• CTC/TCA in China sectoral PP	5.090	0.509	
• CTC/TCA in Mal/Thai NPP	0.252	0.021	
• Contr. to ODS phase-out, MB	64.879	7.136	
<b>Subtotal</b>	<b>337.496</b>	<b>33.362</b>	<b>370.858</b>
<b>b. Investment projects production sector</b>			
• Closure CFC production plants	69.592	5.155	
• Closure Halon production plants (China)	14.400	1.440	
• Closure CTC production plants*	3.089	0.284	
<b>Subtotal</b>	<b>87.081</b>	<b>6.879</b>	<b>93.960</b>

\* Funding requirement for the closure of CTC production plants, consisting of the estimate of US\$2.5 million /RTF02/ plus US\$488,750 agreed for the DPR of Korea

Type of projects	Investment (US\$ million)	Agency support cost (US\$million)	Subtotal (US\$ million)
<b>c. Non-investment projects, supporting activities</b>			
• CAP programme (Personnel, Clearinghouse and Information Exchange)	17.370	1.390	
• Awareness raising	0.600	0.078	
• Preparation CP (updates)	1.200	0.156	
• Institutional Strengthening (IS)	21.021	1.646	
• RMP preparation (updates)	0.720	0.094	
• RMPs	8.400	1.092	
• Halon banking	4.710	0.612	
• MB non-investment activities	0.900	0.117	
• MDI transition strategies	2.980	0.387	
• Other activities IAs	16.500	2.145	
<b>Subtotal</b>	<b>74.401</b>	<b>7.717</b>	<b>82.118</b>
<b>d. Other funding requirements</b>			
• Multilateral Fund Executive Committee and Services of the Multilateral Fund Secretariat	9.910		
<b>Subtotal</b>	<b>9.910</b>		<b>9.910</b>
<b>e. Other funding requirements</b>			
Project Preparation costs	9.264		
<b>Subtotal</b>			<b>9.264</b>
<b>SUBTOTAL</b>	<b>518.152</b>	<b>47.922</b>	<b>566.074</b>
<b>f. MB 20% Production Phase-out</b> Using CE value between US\$3-5	1.844	0.184	<b>2.028</b>
<b>Value of non-investment activities, Which needs to be subtracted</b>	16.598	1.759	<b>-18.357</b>
<b>Total Funding Requirement, Multilateral Fund 2003-2005 Replenishment</b>			<b>549.745</b>

In fact, since the Ad-hoc Working Group indicated that the phase-out of MB production would require a certain amount of funds, the funds calculated in chapter 3 should be added, i.e., an amount in the range US\$1.844 ± 0.461 million (excluding agency support costs at an estimated 10%).

In determining the total one should also take into account the uncertainty in the funding for the CFC consumption sector of US\$19.12 million (including support costs, see chapter 1).

The total funding requirement can be determined as **US\$549.745 ± 19.12 million**. This implies that the total funding requirement for the triennium 2003-2005 is in the range **US\$530.6 – US\$568.9 million**.

Parties may decide that linear reductions after 2005 towards a next Montreal Protocol reduction step would not be eligible for funding in the triennium 2003-2005. If they do this, the above amount will be reduced.

For CTC, TCA and MB a decrease in funding of US\$15.679 million in total can be calculated if reductions after 2005 are not taken into account. This would then result in a total funding requirement of US\$534.1 ± 19.12 million (i.e., the range of US\$515.0 – 553.2 million).

It should also be considered that one report /SEPA02/ mentions a certain amount of ODP tonnes of CTC consumption (in China), which is likely to be eligible and would add about US\$19 million to the total funding requirement. However, these data could not be further considered since they were not confirmed officially. Possible funding would add an amount larger than the decrease calculated if reductions after 2005 are not taken into account for CTC, TCA and MB.

#### *Comment*

Of course, it is possible to define all kinds of variations for different elements in the total funding requirement, however, if the variations are defined at random, it is not possible to determine one value for the total funding requirement plus an uncertainty range. If the variations had been determined according to a certain standard procedure, this might have been possible. In the cases studied here the largest uncertainty will be determining for the total uncertainty according to the sum of the standard deviations.

## 6. References

- /RTF02/ Report of the Technology and Economic Assessment Panel, April 2002, Volume 2, "Assessment of the Funding Requirement for the Replenishment of the Multilateral Fund for the Period 2003-2005", UNEP Nairobi, May 2002, ISBN 92-807-2228-X
- /SEPA02/ "Sector Plan for Phaseout of ODS in Chemical Process Agent Applications in China", State Environmental Protection Administration of China and Beijing University of Chemical Technology, Contract No TA 200003, Revised edition, 26 February 2002
- /TEAP02/ Report of the Technology and Economic Assessment Panel, April 2002, Volume 1, "Progress Report", UNEP Nairobi, May 2002, ISBN 92-807-2227-1

**ANNEX 1 - Meeting Report UNEP/OzL.Pro/WG.5/1, 16 August 2002**





**REPORT OF THE FIRST MEETING OF THE AD HOC WORKING GROUP ON  
THE  
2003-2005 REPLENISHMENT OF THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL ON SUBSTANCES  
THAT DEplete THE OZONE LAYER**

Introduction

In its decision XIII/2, the thirteenth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer established an Ad Hoc Working Group to work closely with the Technology and Economic Assessment Panel (TEAP) to review the study on the 2003-2005 replenishment and to provide feedback to TEAP and advice on sensitivity analyses.

Also in accordance with decision XIII/2, the first meeting of the Ad Hoc Working Group on the 2003-2005 Replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer was held following the twenty-second meeting of the Open-ended Working Group, on Friday, 26 July 2002, at the headquarters of the International Civil Aviation Organization in Montreal, Canada.

Attendance

In accordance with decision XIII/2, the meeting was attended by members from the following Parties operating under article 5: Argentina, Brazil (Co-Chair), China, Colombia, India, Islamic Republic of Iran, Nigeria, United Republic of Tanzania and Zimbabwe; and the following Parties not operating under Article 5: Australia, Finland (Co-Chair), France, Germany, Italy, Japan, Poland, United Kingdom of Great Britain and Northern Ireland and United States of America. The meeting was also attended by representatives of TEAP and by the Executive Secretary of the Ozone Secretariat and representatives of the Secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol as observers.

Officers

In accordance with decision XIII/2, the following Parties acted as Co-Chairs of the meeting:

Brazil: Mr. Benedicto Fonseca Filho

Finland: Mr. Jukka Paavo Juhani Uosukainen

### Opening of the meeting

The meeting was opened by Mr. Fonseca Filho, who pointed out the crucial importance of achieving an appropriate level of funding of the Multilateral Fund for the years 2003-2005, because of its implications for the compliance steps of the Montreal Protocol for 2005, 2007 and beyond. He suggested that members of the Ad Hoc Working Group should address its work in the light of three constraints: that of their mandate, that of the time available to them, and that of the capacity of TEAP to address additional matters, as set out in paragraph 1 (a) of decision XIII/1.

### Adoption of the agenda

The meeting adopted the following agenda:

1. Introduction.
2. (a) Adoption of agenda;  
(b) Organization of work.
3. Summary presentation of TEAP.
4. Summary comparison of the report of the Task Force on Replenishment and document UNEP/OzL.Pro/ExCom 37/66 and Corrs. 1 and 2 of the Executive Committee of the Multilateral Fund.
5. Consumption sector.
6. Production sector.
7. Supporting activities – non-investment activities.
8. Initial feedback and sensitivity analyses to TEAP.

### Organization of work

The Working Group decided to address the items in the order in which they appeared on the agenda, initially listing all proposals for sensitivity analyses and updating of the report, and subsequently determining which of them found consensus.

### Presentation of TEAP

The Co-Chair of TEAP gave a presentation on the four areas on which the Task Force had based its analysis (consumption investment projects; production investment projects; non-investment activities; and areas of other funding for the implementing agencies), also pointing out the amount of ozone-depleting potential (ODP) tonnes which needed to be subtracted according to agreement reflected in Executive Committee decision 35/57.

Summary comparison of the report of the Task Force on Replenishment and document UNEP/OzL.Pro/ExCom 37/66 and Corrs. 1 and 2

The Chief Officer of the Multilateral Fund presented a comparison of the report of the Task Force on Replenishment and document UNEP/OzL.Pro/ExCom 37/66 and Corrs. 1 and 2, clarifying the reasons for any apparent discrepancies between them concerning the data provided.

Consumption sector, production sector and supporting activities  
– non-investment activities

For all of the above items of the agenda, the Working Group considered the need for sensitivity analyses and for updating of the report of the Task Force. Following the discussions, the Co-Chairs prepared a list of draft proposals for the consideration of the Working Group.

Initial feedback and sensitivity analyses to the Technology and Economic Assessment Panel

Following the consideration of the draft proposals, the Working Group adopted the following agreement:

Updating of the report of the TEAP Task Force on Replenishment

1. To update the analysis of the CFC consumption sector, while taking into account all decisions of the thirty-sixth and thirty-seventh meetings of the Executive Committee.
2. To separate out and specify the funding amounts for the linear reductions for all substances for the period after 2005.

Sensitivity analyses

Consumption sector

1. CFCs
  - (a) To have a plus or minus 20 per cent variation in the cost-effectiveness for National Phase-out Plans;
  - (b) To conduct an analysis of the effect of a plus or minus 10 per cent variation in the administrative costs of the implementing agencies;
  - (c) To conduct an analysis of the effect of a plus or minus 20 per cent variation in the cost-effectiveness of refrigerant management plans (RMP) for non-low-volume-consuming countries (LVCs);

- (d) To conduct an analysis of the effect of presuming that all CFC consumption in the servicing sector of non-low-volume-consuming countries will be addressed either through refrigerant management plans or through servicing sector components within national phase-out plans;
- (e) To analyse the implications of the increase in the price of CFCs at 3 per cent and at 7 per cent per annum over the period of the triennium, while the prices of alternatives are considered to remain constant.

## 2. Methyl bromide

- (a) To investigate the implications for the funding requirement of an increase of the 2000 methyl bromide consumption to 10,200 ODP tonnes;
- (b) To prepare an alternative analysis on the basis of the arithmetic mean of the cost-effectiveness values of approved projects;
- (c) To analyse the implications of possible increases or decreases in the price of methyl bromide in Article 5 Parties over the period of the triennium, while the prices of alternatives are considered to remain constant;
- (d) To see what are the implications for the funding requirement if a 50 per cent reduction, compared to the baseline, in Article 5 countries' methyl bromide consumption in 2010 is assumed;
- (e) To evaluate the implications for the funding requirement, based on different assumptions of the schedule for the ratification of the Copenhagen Amendment by Article 5 Parties.

## 3. Carbon tetrachloride

To investigate the implications for the funding requirement of (a) an analysis of carbon tetrachloride consumption on a country-by-country basis, in the light of further information to be provided by article 5 countries by the end of August 2002; and (b) what a plus or minus 30 per cent variation in the funding requirement would imply.

## Production sector

### 1. CFCs

- (a) To conduct an analysis, applying the cost-effectiveness of the production sector phase-out projects for China and India, of the phase-out of the CFC production sector in Argentina, Mexico and Venezuela;
- (b) To conduct an analysis, applying the cost-effectiveness of the production sector phase-out project for the Democratic People's Republic of Korea, of the phase-out of the CFC production sector in Argentina, Mexico and Venezuela.

## 2. Methyl bromide

To determine the implications for the funding requirement of the phase-out of 20 per cent of methyl bromide production by 2005, taking into account the likely cost range of \$3 to \$5 per ODP/kilogram.

### Non-investment activities

1. To conduct an analysis of the effect of a plus or minus 20 per cent variation on the funding requirement for the preparation and/or updating of country programmes.
2. To conduct an analysis of the effect of a plus or minus 15 per cent variation on the funding requirement for the operating costs of the Executive Committee and the Multilateral Fund Secretariat.

### Further action

The Co-Chair of TEAP informed the meeting that the revised version of the report of the Task Force on Replenishment would be available to Parties on 25 September 2002.

The Working Group agreed that no further intersessional meetings of the Group were required, and that it would convene again to consider the revised TEAP Task Force report within the time frame allotted for the fourteenth Meeting of the Parties in Rome in November 2002.

### Closure of the meeting

The meeting was declared closed at 5.30 p.m. on Friday, 26 July 2002.



**ADDENDUM**  
**TO THE SUPPLEMENT TO THE APRIL 2002 TEAP REPLENISHMENT REPORT**

**Procedures Applied to Determine the Funding Requirement for the CFC Consumption Sector**





**ADDENDUM**  
**TO THE SUPPLEMENT TO THE APRIL 2002 TEAP REPLENISHMENT REPORT**

**Procedures Applied to Determine the Funding Requirement for the CFC  
Consumption Sector**

In this Supplement Report, certain procedures have been applied to determine the funding required for the CFC consumption sector for the 2003-2005 timeframe. Compared to the explanation given in the Supplement Report, it is expected that the way procedures have been used requires a brief clarification. This is described in this addendum.

The result, i.e., the funding requirement for the CFC consumption sector for the triennium 2003-2005, is different from the result determined in the April 2002 Report /RTF02/ due to:

- More accurate treatment of projects with delays;
- More accurate determination of the cost-effectiveness of refrigeration projects in Article 5(1) countries, due to a separate consideration of manufacturing and servicing;
- Consideration of the impact of the year of funding in the triennium on the funding requirement;
- The fact that all Sectoral and National Phase-out Plans, agreed at the 36th and the 37th Executive Committee Meeting, are taken into account.

In the sequence in which they are applied, the procedures are as follows:

***Implementation of projects***

- (i) The CFC consumption of Article 5(1) countries as reported is taken as a starting point; from this consumption the amounts addressed in Sectoral and National Phase-out Plans are deducted. This implies that certain countries are not considered in the time dependent analysis and that, for these countries, only the amounts agreed for the triennium 2003-2005 are taken into account.
- (ii) Projects approved and implemented are taken into account in the historic analysis, with a certain implementation lag (this will have no influence on the reported consumption up to the year 2000, one can only conclude whether countries have increased or decreased net consumption if the ODP tonnes from implemented projects are subtracted).
- (iii) Projects that were delayed compared to the implementation period expected (where implementation should have occurred before 2002) are taken into account in later years; they are assumed to be completed during the period 2003-2005.
- (iv) Projects approved and not implemented so far (e.g., approved in 1999-2001) were taken into account according to the time lag function.
- (v) Projects that have been approved or are expected to be approved in 2002, are taken into account using the implementation lag function.

- (vi) The above calculation yields information on the amount of ODP tonnes to be addressed in the projects for compliance by the years 2005 and 2007 (when 50% and 85% reduction in consumption are required).

***Approval Strategies and the Impact of National Phase-out Plans***

- (I) Approval of (all) projects can be done in two ways: in the first year of the triennium or in the (second and) third year of the triennium. Both types of approval strategies yield two different funding requirements. The requirement for the first strategy will be the lowest, for the second strategy it will be higher since funding in 2005 will contribute to reductions after 2007.
- (II) The funding requirements for both types of funding strategies are averaged resulting in a more or less smooth profile for the funding of projects and for the contributions from non-Article 5(1) countries.
- (III) National Phase-out plans result in funding requirements, which are lower than those following the project by project approach. The average factor between Phase-out Plans and the project by project approach is determined from a comparison between the existing National Phase-out Plan approach and the case that the consumption of the same country would have to be addressed via the historic project by project approach.
- (IV) An estimate is made regarding the maximum amount of National Phase-out Plans expected to be approved in the near future (in the first part of the triennium 2003-2005).
- (V) Since it is uncertain how many Phase-out Plans will be approved in the near future (while continuing with a certain amount of projects via the project by project approach) the funding requirement has been determined as the average of the “maximum” National Phase-out Plan approach and the project by project approach (only).
- (VI) The averaging yields a certain funding requirement (a central value) and an uncertainty range (half the difference between the requirement for the project by project approach and the requirement for the “maximum National Phase-out Plan approach).

***Total Funding Requirement for the CFC Consumption Sector***

1. To the funding requirement determined following (VI) above, all obligations from National Phase-out and Sectoral Phase-out Plans are added. This yields the funding requirement for the CFC consumption sector for the triennium 2003-2005.
2. Approvals of further Sectoral or National Phase-out Plans in the year 2002 are likely to change the central value for the funding requirement for the triennium 2003-2005. This change will also depend to a certain degree on the funding disbursement schedule that will be decided for these Plans.