

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



UNEP

**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**

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

Foreword

The April 2002 TEAP Report

The April 2002 TEAP Report consists of three volumes:

Volume 1: April 2002 TEAP Progress Report

Volume 2: April 2002 TEAP Replenishment Task Force Report

Volume 3: April 2002 TEAP Task Force on Collection, Reclamation and Storage Report, together with the

April 2002 TEAP Task Force on Destruction Technologies Report

Volume 1

Volume 1 contains an Executive Summary of all TEAP Report topics, as well as the Executive Summaries of Volumes 2 and 3.

Volume 1 contains

- An accounting framework for ODS production, consumption and emissions (being developed in co-ordination with the SAP);
- recommendations for essential use nominations;
- an update on laboratory and analytical uses (as requested in Decisions XI/13, X/19);
- a chapter on Campaign Production for MDIs (as requested in Decision XIII/10);
- the annual update on nPB production, use and emissions (as requested in Decision XIII/7);
- additional reports on process agent uses (as requested in Decisions X/14 and XIII/13).

Volume 1 also contains information on the proper use of halogenated solvents and progress reports of TEAP Technical Options Committees (according to Decision VII/34). Finally, it presents an update on TEAP's changing membership and gives background and contact information for TEAP and TOC members (Decision VII/34).

Volume 2

Volume 2 is the Assessment Report of the TEAP Replenishment Task Force of the Funding Requirement for the Replenishment of the Multilateral Fund during 2003-2005, in response to Decision XIII/1.

Volume 3

Volume 3 includes reports of the Task Force on Destruction Technologies (TFDT) and the Task Force on Collection, Reclamation and Storage (TFCRS), in response to Decision XII/8.

April 2002,

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ASSESSMENT OF
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EXECUTIVE SUMMARY

The Task Force has estimated the funding requirement for project approvals necessary for compliance during the period 2003-2005, and necessary to enable compliance during 2005-2007. Project implementation beyond 2005 should result in a linear decrease towards a next Protocol reduction step.

This includes projects in both the consumption and production sectors (production closure projects) for all Ozone Depleting Substances. For some multi-year projects, project funding for the triennium has already been agreed upon by the Executive Committee. The funding requirement for all projects, i.e., those estimated and those agreed upon, totals between US\$427.2 and US\$475.4 million during 2003-2005, with the average at US\$451.3 million.

The Task Force has also estimated the funding requirement for non-investment activities, project preparation costs of the Implementing Agencies, costs for the Multilateral Fund Secretariat and the costs for holding Executive Committee meetings. These costs are estimated at US\$90.7 million.

The administrative costs for all Implementing Agencies for all projects in the triennium were determined at US\$52.9 million. Based on guidelines from the Executive Committee, US\$20.4 million must be subtracted from the total funding requirement since it is the value for non-investment activities to be subtracted from investment projects in the consumption sector in non-LVC countries. For further details about the need to subtract funding for non-investment projects, see item 3, "Non-investment Activities", under the Cost Elements heading below.

The total funding requirement for the 2003-2005 replenishment to enable the Article 5(1) Parties to comply with the control schedules under the Montreal Protocol is therefore estimated at **US\$574.5 million ± US\$26.7 million** (i.e., the range US\$548-600 million). The US\$ 26.7 million uncertainty is based upon the fact that the Task Force has not been able to derive a one-point estimate for the funding requirement in the CFC consumption sector.

ES.1 BACKGROUND AND METHODOLOGY

Mandate from the Parties to TEAP; Decision XIII/1

The Thirteenth Meeting of the Parties made a detailed request to TEAP to prepare a replenishment report and present it to the Open-ended Working Group at its 22nd Meeting to enable the Parties to decide at their Fourteenth Meeting on the appropriate level of the 2003-2005 replenishment of the Multilateral Fund (Decision XIII/1).

TEAP Response; Replenishment Task Force

The TEAP constituted a Task Force of seven members from Australia, Belgium, Brazil, China, Hungary, The Netherlands, and Venezuela to prepare the report.

Technical and Financial Consultations

The Task Force carried out consultations with a wide range of financial and technical experts. Interviews were conducted during the 35th Meeting of the Executive Committee held in Montreal, December 2001. The Task Force extensively consulted the Secretariat of the Multilateral Fund, the Ozone Secretariat and the Implementing Agencies. A questionnaire was dispatched to all Parties, to members of the Ad-hoc Working Group on the 2003-2005 Replenishment (as appointed by the 13th Meeting of the Parties) and to the 2001 Executive Committee members. Thirty-two Parties responded to the questionnaire.

A small group of experts, selected by the Task Force, in consultation with the TEAP, reviewed the April 2002 draft of this report. The review group included the Chair and Vice-Chair of the 2001 Executive Committee from Germany and Tunisia, respectively, the Chief Officer of the Multilateral Fund Secretariat and the Deputy Executive Secretary of the Ozone Secretariat. The final review and completion of the document was subsequently carried out by the TEAP at its meeting in Budapest during 29 April-3 May 2002.

Data

The Replenishment Task Force used the data for the consumption and production of all ODS in all Article 5(1) countries as reported to the Ozone Secretariat; it included the most recent reports for the year 2000. Several countries had revised the data they had reported to the Secretariat for the years 1995-1998, which includes the baseline data. These revisions indicate that consumption for those years was higher than estimated in the 1999 Replenishment Task Force Report.

Furthermore, CFC consumption by Article 5(1) Parties did not decrease during 1998-2000 as much as was expected in the 1999 Report.

More data on CTC, TCA and methyl bromide were available for this study than in 1999, so that clear trends could be derived and anomalies in data reporting could be corrected.

Project approvals through the year 2001 amounted to 116,611 ODP-tonnes of CFCs (with 9,836 ODP-tonnes expected to be approved during 2002). Several methyl bromide phase-out projects, as well as a number of CTC

projects in the solvent and process agent sector were approved through the year 2001.

Analysis shows that more than 80% of the baseline CFC consumption has already been addressed by projects in all Article 5(1) countries except in the countries with a baseline consumption between 100 and 360 ODP-tonnes, where the percentage is 60%.

The cumulative amount of CFCs implemented and phased out per year in the period 1995-2000 resulting from project approvals has been calculated for different country groups. Addition of the reported annual consumption values to the amounts implemented results in a relatively constant total amount of ODP-tonnes. This implies that, apart from project implementation, there are no important factors that lead to a decrease of the CFC consumption. This conclusion can be drawn to date, but may change in the near future. One interpretation that could be drawn is that the “overall”, global impact of non-investment activities has been the compensation for consumption growth, which occurred in some Article 5(1) countries.

Cost Elements

This report provides estimates of the funding requirements for the major cost components of the 2003-2005 replenishment of the Multilateral Fund as follows:

- Investment projects to reduce consumption of CFCs, carbon tetrachloride (CTC), 1,1,1 trichloroethane (TCA), and methyl bromide;
- Investment projects to reduce production of the substances mentioned above, particularly CFCs and halons;
- Non-investment activities such as an information clearing-house and information exchange, the activities of regional networks, public awareness, institutional strengthening, training, refrigerant management plans (RMPs), halon banking plans, technical assistance, and country programme preparation and updating;
- Administrative costs of the Implementing Agencies;
- Project preparation costs of the Implementing Agencies; and
- Operating costs of the Multilateral Fund Secretariat and the costs for holding Meetings of the Executive Committee.

These six cost components were addressed individually as described below.

1. Investment Projects for the Consumption Sector

The study by the Replenishment Task Force used the following elements to estimate project approvals for investment projects in the consumption sector:

- Data on the production and consumption of all controlled substances as reported to the Ozone Secretariat by all Article 5(1) Parties;
- Investment projects' approvals as compiled by the Multilateral Fund Secretariat for the period 1991-2001 plus those listed in the Consolidated 2002 Business Plans of the Implementing Agencies;
- Implementation lags reflecting the time required for ODS reductions to be realised, i.e., a 0 to 6 year time lag (dependent on the substance and on the type of project). The implementation time lag functions were obtained from experience or from completion reports of projects;
- Cost-effectiveness figures determined from the Multilateral Fund Secretariat's database for the years 1998-2001, which were averaged.

Project approvals estimated for the triennium 2003-2005 are based on achieving compliance with the Protocol reduction steps, with linear interpolation where these lie outside the triennium:

- CFC: 50% and 85% reduction in 2005 and 2007, respectively;
- CTC: 85% in 2005, followed by a linear decrease towards the phase-out in 2010;
- TCA: 30% in 2005, followed by a linear decrease towards the 70% reduction step in 2010;
- MB: freeze in 2002, 20% reduction in 2005, followed by a linear decrease towards the phase-out in 2015.

For the CFC consumption sector countries were sub-divided into five Country Categories. The same version of the spreadsheet model that was applied in the 1999 Replenishment Study was used, where the countries in Categories 4 and 5 (the LVC countries) were assumed to not receive funding for investment projects, other than via Refrigerant Management Plans. All currently existing phase-out agreements with Article 5(1) countries were taken into account. An analysis was made of the reductions required following the "historic" Task Force spreadsheet approach versus those accorded in National Phase-out Plans and their cost effectiveness. This analysis showed significant differences in cost effectiveness. The Task Force compared the results of using the two different approaches to calculate the replenishment for the triennium 2003-2005. The Task Force determined the optimum solution to estimating the funding requirement for the CFC consumption sector to be the average of two approaches.

A lumped approach was used to determine the funding requirement for reductions necessary in the CTC (used as a solvent and as a process agent) and in the TCA consumption sectors, since only a small number of countries use significant amounts of these substances.

A data analysis for each country was performed to determine the reductions required for MB. This type of analysis shows substantial differences if compared to a lumped approach, largely because some countries have achieved, or plan to achieve reductions in MB consumption greater than those according to the agreed controls. The Task Force first assessed the impact of projects approved during 1998-2001 and to be approved during 2002 on the funding requirement. The consumption levels during the triennium 2003-2005 were then determined. Subsequently, the ODP tonnage that needs to be approved so that all countries will meet the freeze and the 20% reduction step in 2005 was estimated. This was followed by some reductions that were indicated when applying a linear reduction towards the phase-out by the year 2015.

There is no evidence that the relative prices of ODS or alternative substances are rising significantly in the coming years. Thus, there is little price incentive for a market-driven switch to alternatives. These market conditions are likely to continue during the triennium 2003-2005 in the absence of policy intervention to create scarcity of CFCs relative to those of alternatives. This conclusion has been drawn in spite of the fact that the reports from Article 5(1) Parties indicate that CFC consumption exceeds production by more than 6,000 ODP-tonnes annually, creating a market imbalance.

2. Investment Projects in the Production Sector

Estimates were based on the costs for projects already agreed with China for Halons and CFCs, and with India and the Democratic Republic of Korea for CFCs. This also includes an allowance estimated by the Task Force for additional Article 5(1) country agreements like those to be agreed during the 2003-2005 replenishment period. First estimates were made regarding compensation, i.e., the funding requirement, for the closure of CTC producing plants.

3. Non-investment Activities

In many cases, cost information for these activities, which support investment projects in phasing out ODS consumption (and production), were received by the Replenishment Task Force. They are based on the Business Plans of the Implementing Agencies, in particular UNEP, and on information from the Multilateral Fund Secretariat. In other cases, estimates were made by the Task Force based on extrapolation from data in the existing databases towards

the future replenishment 2003-2005. The costs for non-investment activities were all split in costs for non-LVC and costs for LVC countries.

For the non-investment activities, the current guidelines as issued by the Executive Committee (particularly those issued at the 35th and 36th Meeting) were taken into account. This means that the costs for non-investment activities in non-LVC countries (countries with a consumption larger than 360 ODP-tonnes as a baseline) have to be converted to an ODP tonnage using the conversion factor US\$12.1/ODP kg. This tonnage has to be subtracted from the consumption that can be phased out by investment projects. The Task Force calculated the value of the above tonnage using the average cost effectiveness value of projects and subtracted it from the total funding requirement determined.

4. Administrative Costs of the Implementing Agencies

Different charges were applied to all types of project approvals. These charges were individually agreed by the Executive Committee or according to guidelines issued by the Executive Committee. In cases where no direct support cost information was available, estimates of the agency support costs were made on the basis of experience with similar types of projects. By adding all cost components the total funding for this element was determined.

5. Project Preparation Costs of the Implementing Agencies

Project preparation costs for the triennium 2003-2005 were estimated from the average of the project preparation costs per year during the period 1998-2001.

6. Operating Costs of the Multilateral Fund Secretariat and the costs for holding meetings of the Executive Committee

These costs were determined on the basis of planned expenditure on current operations, including the monitoring and evaluation part.

ES.2 FUNDING REQUIREMENT FOR THE 2003-2005 REPLENISHMENT OF THE MULTILATERAL FUND

The Task Force has estimated the funding requirement for project approvals necessary for compliance during the period 2003-2005, and necessary to enable compliance during 2005-2007. Project implementation beyond 2005 should result in a linear decrease towards a next Protocol reduction step. The funding requirement for this replenishment period would be less than calculated if Parties choose to only finance the reduction step in the year 2005 (for CFCs, CTC, TCA and MB), allowing production and consumption to remain at the maximum level until the year when a next reduction step will be required. However, such a minimum-finance strategy would jeopardise the

pace of phase-out and would not be administratively feasible, because projects cannot be instantly implemented at the time of this next substantial reduction step (e.g. 2007 for CFCs, 2010 for CTC and TCA). Project implementation is governed by a time lag between approval and implementation. It is for that reason that the reductions to be achieved beyond 2005 need to be partially addressed in this period. For example, the larger part of the funding requirement calculated for CFC investment projects is required for complying with the 35% reduction from 2005 to 2007 (when the consumption should be 15% of the baseline). This way of addressing the phase-out will also keep the momentum that exists.

The Task Force has also estimated the funding requirement for agreed production closure projects, non-investment activities, administrative and project preparation costs of the Implementing Agencies and costs for the Multilateral Fund Secretariat.

The funding requirement for the 2003-2005 replenishment to enable the Article 5(1) Parties to comply with the control schedules under the Montreal Protocol is estimated at *US\$574.5 million ± US\$26.7 million* (i.e., the range US\$548-600 million). Details are given in the table below.

Replenishment Cost Components:	US\$ Million
CFC Consumption Sector Projects	239.6
Chillers, investments for starting revolving funds	5.0
CTC/ TCA Consumption Sector Projects	58.1
MB Consumption Sector Projects	64.9
Investments: Production Sector	83.7
Non-investment activities; supporting Activities	71.5
Administrative costs of Implementing Agencies	52.9
Project preparation cost	9.3
MLF Secretariat/ Executive Committee Operational Costs	9.9
Non-investment activity value to be subtracted	-20.4
Total	574.5

The US\$ 26.7 million uncertainty is based upon the fact that the Task Force has not been able to derive a one-point estimate for the funding requirement in the CFC consumption sector for the triennium 2003-2005.

1. Introduction

1.1 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, 23-25 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.

1.2 Scope and Coverage

Decision XIII/1 directs the Panel, in preparing its report, to take into account, *inter alia*:

- (a) All control measures, and relevant decisions agreed by the Parties to the Montreal Protocol and the Executive Committee, including decisions by the 13th Meeting of the Parties and the 35th Meeting of the Executive Committee, in so far as these will necessitate expenditure by the Multilateral Fund during the period 2003-2005;
- (b) The need to allocate resources to enable all Article 5 Parties to maintain compliance with the Montreal Protocol;
- (c) Agreed rules and guidelines for determining eligibility for funding of investment projects (including those in the production sector) and non-investment projects;
- (d) Approved country programmes;
- (e) Financial commitments in 2003-2005 relating to sectoral phase-out projects agreed by the Executive Committee;
- (f) Experience to date, including limitations and successes of the phase-out of ozone-depleting substances achieved with resources already allocated, as well as the performance of the Multilateral Fund and its implementing agencies;
- (g) The impact that the controls and country activities are likely to have on the supply and demand for ozone depleting substances, and the effect that this will have on the cost of ozone depleting substances and the resulting incremental cost of investment projects during the period under examination;

- (h) Administrative costs of the implementing agencies, taking into account paragraph 6 of decision VIII/4, and the cost of financing the secretariat services of the Multilateral Fund, including the holding of meetings.

Decision XIII/1 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. The Decision also asks the Panel to strive to complete its work in time to enable its report to be distributed to all Parties two months before the 22nd Meeting of the Open-ended Working Group (Montreal, 23-25 July 2002).

Two recent relevant Executive Committee decisions, which should be taken into account, i.e., Decisions 31/48 and 35/57, are presented in Annex 1 to this report.

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*). As requested by the Parties, the Secretariat will convene 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 will provide initial feedback and advice on sensitivity analyses to the Technology and Economic Assessment Panel.

1.3 Composition of the Task Force and Consultative Processes

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 (The 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 was co-chaired by Shiqiu Zhang and Lambert Kuijpers. The Task Force met in Montreal, December 2001, to attend the 35th Executive Committee Meeting, to conduct interviews and consult with the Multilateral Fund Secretariat. It met again in Washington D.C., March 2002, to discuss the first draft report and to make proposals for the second draft. The second draft was discussed via e-mail contacts; a third draft report was subsequently composed for discussions before the TEAP meeting in Budapest. The final review and completion of the document was subsequently carried out by the TEAP at its meeting in Budapest during 29 April-3 May 2002.

An external review 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), who reviewed the drafts for consistency and accuracy of data.

The consultation process involved the members of the 2001 Executive Committee, the Multilateral Fund Secretariat, the Ozone Secretariat, the Implementing Agencies, members of the Ad-hoc Working Group and other national experts from both Article 5(1) and non-Article 5(1) countries. The Task Force sent a questionnaire to the individual members of the 2001 Executive Committee, to the members of the Ad-hoc Working Group, and subsequently, to all Parties via the Ozone Secretariat. The text of the questionnaire is given in a separate Appendix to this report; a summary of the responses received is also presented in this Appendix.

The Task Force decided to use the same analytical approach that was used for the 2000-2002 replenishment report. This approach uses a spreadsheet model (with a country-by-country approach for the larger Article 5(1) countries) to estimate funding requirements for investment projects in the CFC consumption sector; it implies adequate transparency. This spreadsheet model approach has been compared to other ways of determining the funding requirement, from which comparison the Task Force could present its best estimate. For MB, a country-by-country analysis and a spreadsheet model were used to determine the funding requirement for addressing MB. It should be stated here that the use of a spreadsheet model facilitates sensitivity analyses to assess the implications for the 2003-2005 funding requirement of specific changes in key assumptions.

The Task Force used a lumped model for determining the funding requirement for consumption reductions in CTC and TCA. A straightforward estimation technique was used for investment projects in the production sector and also for non-investment projects. These determinations were based on consultations with the Implementing Agencies, the Multilateral Fund Secretariat and with national experts. In all calculations, the most recent version of the Multilateral Fund Secretariat Document *Inventory of Approved Projects (as at December 2001)* /IAP02/ has been used as the main reference.

1.4 The Structure of the Report on the 2003-2005 Replenishment

The structure of the 2002 TEAP Replenishment Task Force Report is as follows:

Chapter 1, “Introduction”, presents the Terms of Reference, the setting up of the Task Force and the consultative processes followed in preparing this report.

Chapter 2, “Background”, describes the creation of the Multilateral Fund, the previous replenishments of the Multilateral Fund, and a brief account of the contribution of the Multilateral Fund to the efforts of the Article 5(1) Parties to comply with the control schedules of the Montreal Protocol. Further information is presented in Annex 2 to this report, particularly on the approval and implementation of projects.

Chapter 3, “Methodology”, identifies the commitments that the Article 5(1) Parties will have to meet if they are to achieve compliance with the control schedules of the Montreal Protocol during the 2003-2005 replenishment period and beyond. Subsequently, the methodology used to estimate the funding requirement for investment projects in the CFC consumption sector is explained in Annex 5. For methyl bromide, the methodology used to estimate the funding requirement for 2003-2005 is presented in Annex 6.

Chapter 4, “The Funding Requirement for the 2003-2005 Replenishment; the Consumption Sector”, presents the estimates of the funding requirement for the implementation of the 2003-2005 Replenishment of the Multilateral Fund for the consumption sector projects, as defined in Chapter 3 above. The estimate for the CFC consumption sector is derived from the comparison of the spreadsheet model results with the values determined via other approaches, for MB a spreadsheet analysis is used and for CTC and TCA a lumped approach is applied.

Chapter 5, “The Funding Requirement for the 2003-2005 Replenishment; the Production Sector”, presents the estimate of the funding requirement for the 2003-2005 Replenishment of the Multilateral Fund where it concerns all

possible production sector phase-out projects. For a large part they have been decided upon, for others the Task Force has made a best estimate.

Chapter 6, “The Funding Requirement for the 2003-2005 Replenishment; Supporting Activities - Non-investment Projects”, presents the estimates of the funding requirement for all the different types of non-investment projects, as well as for the operating costs of the Multilateral Fund and its Executive Committee. Although they are normally not seen as non-investment activities, project preparation costs are also dealt with here.

Chapter 7 summarises the different amounts that have to be considered in determining the total funding requirement for the triennium 2003-2005 in a table.

Chapter 8, “Conclusions”, presents comments and qualifications on the way the funding requirement has been determined for the 2003-2005 replenishment of the Multilateral Fund.

1.5 Purpose of the Report

The purpose of this report is to assist the Parties in reaching a decision on the appropriate funding requirement for the 2003-2005 replenishment of the Multilateral Fund. The TEAP prepared this report at the request of the Parties, in accordance with the terms of reference as set out in Decision XIII/1. The TEAP endeavoured to ensure transparency in consultations, methodology, including estimating procedures, and in reaching conclusions. After having been reviewed by the outside reviewers (see above in section 1.3), this report was reviewed and subsequently adopted by consensus of the UNEP Technology and Economic Assessment Panel (TEAP) as established under the Montreal Protocol at its meeting in Budapest, 29 April-3 May 2002.

2. Background

2.1 The Financial Mechanism and Subsequent Replenishments

The original 1987 Protocol addressed these issues in Article 5, paragraphs 2 and 3, and in Article 10, paragraphs 1 and 2. Following the adoption of the Montreal Protocol in 1987, the Science Assessment Panel demonstrated that the original control measures would not protect the ozone layer. Mindful of the science assessment, the Parties agreed to accelerate the phase-out schedules for chemicals that were already controlled and to extend control measures to additional ozone-depleting substances. The Parties recognised that a formal financial mechanism was required to meet the needs of Parties operating under paragraph 1 of Article 5.

Accordingly, at their First Meeting, (Helsinki, May 1989), the Parties established an Open-ended Working Group to develop assistance modalities, including an international funding mechanism.

At their Second Meeting (London, June 1990), the Parties agreed that the needs of the Parties operating under paragraph 1 of Article 5 required co-ordinated and specific actions beyond those already in place. Therefore, the Parties decided (Decision II/8) to establish an Interim Financial Mechanism to provide financial and technical co-operation for Parties operating under paragraph 1 of Article 5 of the Montreal Protocol, to enable their compliance with the control measures set out in Article 2. For procedural reasons, the Mechanism was established initially on an interim basis for 1991-1993. The Mechanism provided for an Interim Multilateral Fund that would operate under the authority of the Parties to the Montreal Protocol. For the 1991-1993 period, the Parties decided to provide US\$160 million to the Interim Multilateral Fund with the proviso that it would be increased by an additional US\$80 million once more countries had ratified the Protocol. In Decision III/22, Parties eventually endorsed the proposal to raise the total amount of the Interim Multilateral Fund by US\$40 million to US\$200 million for 1991-1993.

In Decision IV/18, paragraph 3, The Parties decided “to commit to a replenishment of the Fund in order to meet.....the requirements of Parties operating under paragraph 1 of Article 5 of the Protocol, in respect of agreed incremental costs as indicated by the figures US\$340-500 million for 1994-1996”. In 1993, a replenishment of US\$510 million was agreed by the Parties at their Fifth Meeting in Bangkok for the period 1994-1996, which included a carry-over of US\$55 million from the previous period. The replenishment was based on an assessment by the Executive Committee of the needs of the Article 5(1) Parties and on the results of two independent studies.

In 1996, a replenishment level of US\$540 million was agreed at the Eighth Meeting of the Parties in Costa Rica for the period 1996-1999, which

included a carry-over of US\$74 million from the previous period. The replenishment was based on an assessment by the Replenishment Task Force of the Technology and Economic Assessment Panel. This level as decided was based on the US\$436.5 million estimate prepared by the TEAP Replenishment Task Force. This estimate, accompanied by a recommendation for an additional US\$40-60 million to maintain the phase-out momentum in the Article 5(1) countries was referred to as the Reference Case.

The 2000-2002 replenishment level decided by the Parties at their Eleventh Meeting in Beijing was US\$475.7 million; this amount included a carry-over of US\$35.7 million from the previous period. It was based on the US\$506 million estimate prepared by the TEAP Replenishment Task Force, which amount included an extra amount recommended for advanced funding at a level of US\$200 million (the “Advanced Funding Case” in the 1999 Replenishment Task Force Report /RTF99/).

Currently, the Fund is in the final year of its fourth triennial replenishment period. During the 1991-2001 period (as at 7 December 2001) the non-Article 5(1) Parties paid US\$1.277 billion into the Fund, which is about 89% of their combined assessed contributions.

2.2 Historic Information

Data

The study conducted in 1999 for the 2000-2002 replenishment of the Multilateral Fund used CFC consumption data submitted by the Article 5(1) Parties to the Ozone Secretariat for the years 1994-1997. Where data for 1997 were not available, they were extrapolated by the Task Force. The data were used in a spreadsheet model together with certain assumptions regarding the growth in consumption for the period after 1997, through 1999. Consequently, the 1999 estimates used to determine the funding requirement for the 2000-2002 replenishment period were subject to a certain degree of uncertainty given the need to use extrapolated data where data had not been reported, the errors in reported data and the need to estimate the CFC consumption growth based on these data. It should be noted that estimates for future consumption based on uncertain 1998 and 1999 data could be quite different from the actual consumption levels currently reported for the years 1999-2000.

Funding

The 1999 estimate of the funding requirement for CFC investment projects in the consumption sector was US\$218.1 million (excluding agency support costs). This estimate included US\$178.6 million (US\$200 million including support costs) as “advanced funding”. This amount was included, since it was estimated that there would be large fluctuations between the separate

replenishments during the period 2000-2010 (2000-2002, 2003-2005 and 2006-2008) and this advanced funding would then smoothen the funding profile. The advanced funding should also be considered as funding for “maintaining momentum” in the phase-out process. If the funding would be seriously decreased during one replenishment period in a series, it would lead to a loss of momentum in the phase-out process.

The 1999 study estimated a CFC consumption of 81,000 ODP-tonnes for the year 2000 for those Article 5(1) countries that apply for support from the Multilateral Fund. Data submitted to the Ozone Secretariat in later years (in 2001 and 2002) showed that the reported CFC consumption for 2000 was significantly higher and it is now calculated to be about 105,000 ODP-tonnes (see Table 2-1), 24,000 tonnes higher than derived from the 1994-1997 pattern. This slow decline in CFC consumption may have been partially due to the implementation of a lower level of project approvals than expected. Furthermore, the consumption in Article 5(1) countries did not decrease as expected during 1998-1999.

Moreover, the quality of the data reported also causes a difference, since several countries revised data upwards for the years 1995-1997 in 1999 and thereafter. Information from the Ozone Secretariat /UNEP02/ is that:

- 28 countries revised their baseline upwards (including 7 countries in Categories 1 and 2) (implying an increase of 11,300 ODP-tonnes);
- 28 countries revised their baseline downwards (including 2 countries in Categories 1 and 2) (implying a decrease of 1,041 ODP-tonnes);
- 28 countries reported their baseline that had so far not reported (including 2 countries in Category 2) (implying an increase of 10,965 ODP-tonnes).

This means that more CFC ODP-tonnes will have to be phased out in the replenishment period 2003-2005 to comply with the Protocol than were calculated in the 1999 Replenishment Task Force Study /RTF99/.

2.3 ODS Production and Consumption in Article 5(1) Countries

In Table 2-1, the ODS consumption levels for the years 1995-2000 are given for all Article 5(1) Parties that have received support from the Multilateral Fund.

The 1995-1999 data are as reported to the Ozone Secretariat /UNEP02/. The Task Force has not attempted to adjust for unreported data regarding these years. Unreported data for the year 2000 /UNEP02/ have been estimated by applying extrapolation techniques to the consumption patterns of earlier years, particularly for Annex B, but also for Annex A substances (where the vast majority had been reported). Consumption of MB (the Annex E substance) is as reported to the Ozone Secretariat /UNEP02/, except for the year 2000 where some extrapolations were made.

Table 2-1 shows that the consumption of ODS increased from slightly more than 130,000 ODP-tonnes (for Annex A substances) in 1986, to about 230,000 ODP-tonnes in 1995, after which the total Article 5(1) consumption began to decline. Between 1995 and 1996, the consumption level decreased substantially, by approximately 30,000 ODP-tonnes (Annex A and B substances), due to the implementation of Multilateral Fund projects and despite country-dependent CFC consumption growth patterns.

Table 2-1 ODS consumption levels (ODP-tonnes) for the Article 5(1) countries considered for MLF funding for the years 1986 and 1995-2000 for CFCs, halons, Annex B and E substances /UNEP02/.

Year	1986	1995	1996	1997	1998	1999	2000
CFCs	103,229	168,593	138,252	137,519	130,073	113,210	105,462
Halons	31,666	40,876	39,563	44,011	30,388	24,515	20,519
Annex B, CTC		9,234	9,574	9,234 (17,401)*	7,137 (16,043)*	17,865 (26,918)*	14,387 (24,830)*
Annex B, TCA		1,673	1,614	1,412	1,408	1,283	1,298
Annex E, MB		8,577	8,585	9,179	10,564	8,215	9,185
Total		228,953	197,588	201,355	179,570	165,088	150,851

Note: Consumption data reported by the Republic of Korea, Saudi Arabia, Singapore, South Africa, UAE, Malta and Cyprus have not been taken into account, because these countries do not apply for financial support from the Multilateral Fund.

Note: A few countries had not reported 2000 data by end March 2002; in these case, data were extrapolated from the 1997-1999 consumption pattern. China's MB consumption in 2000 was approximately 1,680 ODP-tonnes /SEP02a/. China did not report Annex B, CTC consumption data for process agents; CTC totals including Chinese informal data /SEP02b/ are given in brackets with an *. Totals do not include Chinese CTC process agent data.

The total consumption of all controlled substances in 1997 showed a small increase compared to the year 1996 (4,000 ODP-tonnes), even though project implementation continued in the large CFC consuming Article 5(1) countries. This unexpected result may have been due to CFC stockpiling by companies in Article 5(1) countries; either to increase their respective freeze value (the average of 1995, 1996 and 1997 CFC consumption), and/or as a precaution against supply disruption following the CFC phase-out in non-Article 5(1) countries.

The 1997-2000 period is characterised by a steady decrease in the reported consumption of all controlled substances, by about 15,000 ODP-tonnes per year. However, this steady character is a result of different tendencies in the reported consumption of the single substances. The reduction in CFC consumption varied per year; if one takes into account the assumed

implementation of projects for the years 1999 and 2000, the relative CFC consumption of CFCs tends to grow again during 1999-2000 (see also Annex 2).

Halon consumption steadily decreases because this pattern is determined by one major consuming Article 5(1) country, where the consumption levels have been agreed via a Decision by the Executive Committee. It should, however, be stated that the halon consumption did not decrease as much as expected in the 1999 Replenishment Task Force Study /RTF99/ in those countries that do not produce halon.

During the period 1998-2000 the consumption of CTC increased substantially, however, it is not expected to further increase after the year 2000 since the consumption has to follow the Protocol schedule and has to be decreased by 85% of the baseline consumption by the year 2005.

The consumption pattern of methyl bromide for all Article 5(1) countries shows fluctuations which cannot be easily explained, particularly the low number of 8,215 ODP-tonnes reported for the year 1999. This might be due to the fact that not all data have been reported in the correct way, and that they will be revised by Parties in the near future. It should be mentioned that the use of methyl bromide is season-dependent, which can cause fluctuations. For 2000 Parties have reported a total of 9,185 ODP tonnes of MB; however, for the calculation of the MB funding requirement extrapolations had to be made from the consumption pattern of earlier years, for those countries for which no data were submitted. The total consumption level in the year 2000 has been calculated as 9,425 ODP-tonnes and it should be stated that it could well have been as high as 10,000 ODP-tonnes.

However, the funding requirement for the MB consumption sector in the triennium 2003-2005 was calculated using the data reported to the Ozone Secretariat and the data in MB project agreements of the Executive Committee. In the case of China, the largest MB consumer, preliminary estimates for 2000 were provided by SEPA /SEP02a/. China's consumption was included in the study because China has officially announced its intention to ratify the Copenhagen Amendment before the end of 2002, i.e., before the triennium 2003-2005.

2.4 Approved Projects

During 1991-2001, inclusive of the 35th Executive Committee meeting held in Montreal, December 2001, a very large number of projects were approved. A summary compiled from data made available by the Multilateral Fund Secretariat /MFS02/ is given in Annex 2 for each Country Category. The ODP-tonnes to be phased out by approved projects are used in the model for the consumption sector (see further chapter 4 and the relevant annexes).

The largest number of approved projects were in the CFC consumption sector. It amounts to 116,611 ODP-tonnes through the year 2001. By the end of 2001, projects to phase out 93,292 ODP-tonnes were implemented; this represents 80% of all approvals until then (see Annex 2 and 5). This value of 93,292 ODP-tonnes is based upon the assumed time lag between project approval, and implementation and realisation of results.

For the year 2002 it is expected that 9,836 ODP-tonnes of CFC projects will be approved which brings the total amount of approvals to 126,447 ODP-tonnes for the four triennia (1991-2002) of Fund operation. Relatively small amounts have so far been approved in the CTC and TCA consumption sectors. As a result, these substances will become more important during the 2003-2005 triennium than they were in previous periods.

Information from the Multilateral Fund Secretariat /MFS02/ shows that not all projects approved have been implemented in the way described by the implementation lag. Certain projects have so far not been implemented – although it had been expected-- or were implemented with a significantly larger delay than according to the time lag function, as assumed in the spreadsheet model. However, the Task Force (within the timeframe available for the study) did not have enough information on a country-by-country basis, to draw firm conclusions regarding the possible impact on the funding requirement for the period 2003-2005.

For this reason the analysis has been performed according to the “historic” approach using one implementation lag function for all approved CFC projects. It should be emphasised that, in the case of the spreadsheet based determination of the funding requirement for the period 2003-2005 the historic cost effectiveness factors, the historically determined lags in implementation etc. have been considered by the Task Force (see chapter 4). This also applies to the MB consumption sector.

In the last two triennia, production phase-out plans were approved for the CFC and halon production sector, aimed to phase out about 123,180 ODP-tonnes of ODS production.

3. Methodology

3.1 Introduction

This chapter presents the objectives and methodology used to estimate the funding requirement for the 2003-2005 replenishment of the Multilateral Fund. The estimating procedures build on those used in the preparation of previous replenishment reports, particularly the 1999 Task Force Report /RTF99/. For determining the funding requirement for MB, a country-by-country spreadsheet analysis was applied, as in the 1999 Task Force Report /RTF99/ was used. In the case of CTC and TCA different, lumped estimating procedures were applied. The factors that most significantly affect the empirical results are identified and discussed: the underlying assumptions, the analytical methods, the agreed sectoral projects and national plans, as well as the consultative procedures.

3.2 Control Schedules for Article 5(1) Countries

A consolidated list of the Montreal Protocol control schedules, as they apply to the Article 5(1) countries, is provided in Table A3.1 (Annex 3). The list includes production and consumption of the following controlled substances: Annex A, Groups I (CFCs) and II (halons); Annex B, Groups I (other fully halogenated CFCs), II (carbon tetrachloride) and III (1,1,1 TCA, or methyl chloroform); Annex C, Groups I (HCFCs) and II (HBFCs); and Annex E (methyl bromide).

3.3 Comparison with Previous Replenishments

The funding requirement for the 2003-2005 Replenishment is based on the best available estimates for the key parameters of the consumption sector model and other key factors that could not be estimated by formal statistical techniques.

The Task Force assessed two different time horizons in its 1999 Report /RTF99/. The first time horizon addressed only those projects for which project approvals would be necessary during 2000-2002. Implementation of these projects would allow compliance with the freeze (1999/2000) and the reduction steps for all Annex A, Annex B and Annex E substances during the period 2000-2005. The second time horizon addressed project approvals that would be required during the 2003-2005 replenishment period to finance compliance with subsequent control measures on Annex A, B and E substances. This approach was taken to make it possible to capture the implications of effects of time lags between project approvals and implementation.

In 1999, the Task Force calculated a large imbalance between the funding requirement needed for the period 2000-2002 and the period 2003-2005 /RTF99/. The Task Force defined the so-called “Base Case” for the 2000-2002 Replenishment, where the funding requirement would be about US\$300 million. However, first calculations made in 1999 of the funding required during the period 2003-2005 indicated that more than US\$800 million would be required /RTF99/.

It is for that reason that the Task Force, in 1999, studied the influence that the level of funding in the first period would have on the amount of funding required in the second period, i.e., 2003-2005 /RTF99/. It concluded that the addition of US\$200 million (the “Advanced Funding Case”) would dampen the large fluctuations expected in the funding profile /RTF99/. When the Parties decided the 2000-2002 replenishment, they approved slightly more than US\$130 million above the replenishment level determined under the Base Case (i.e., US\$440 million was approved). This level of funding reduces the amount of funds calculated under the Base Case for the triennium 2003-2005.

However, it is difficult to conclude at this stage whether the starting points for the calculations made in 1999 are still valid and whether the addition of the extra US\$130 million will indeed avoid larger increases in the funding requirement for the period 2003-2005. This is not only related to the phase-out of CFCs, but, in particular also to the reduction that has to be achieved in the consumption of CTC, TCA and MB. The data reported by Parties for these substances have shown developments, which could not be foreseen by the Task Force in the year 1999 /RTF99/. Furthermore, in the determination of the funding requirement for 2003-2005, a number of other factors play a role such as:

- (1) new or revised consumption data submitted by the Parties;
- (2) lower or higher CFC consumption levels for the year 1999 (and maybe 2000) than expected, but still lower than the freeze value determined from the baseline consumption 1995-1997;
- (3) delays in the implementation of approved projects;
- (4) different cost effectiveness of projects, or new approaches in sectoral or national phase-out plans leading to a more favourable cost effectiveness;
- (5) introduction of some controlled substances which will have their first reduction step in consumption and production in the triennium 2003-2005.

The Replenishment Task Force decided not to investigate two different time horizons for this assessment report; the second time horizon implies the determination of a rough figure for the funding requirement of the future 2006-2008 replenishment. The Task Force so decided because:

- (1) due to innovative approaches and new strategies under the Multilateral Fund, the funding principles may have completely changed in the year 2005 to sectoral and phase-out approaches; and
- (2) during the next three-four years, non-investment activities (and projects funded outside the Multilateral Fund) will have a more outspoken influence on the consumption level for the years 2004-2005 than they had in the past, and
- (3) the funding required during the period 2006-2008, when the last 15% of the CFC and CTC consumption has to be addressed, will be lower than during the period 2003-2005 when a 35% reduction has to be addressed, and
- (4) reductions made in the CTC consumption level, cannot be estimated reliably into the future.

3.4 Important Factors in the Methodology Applied

The capacity of an Article 5(1) Party to comply with the control schedules of the Montreal Protocol is influenced by the following key factors:

- the implementation of projects during 2003-2005 that were approved prior to that period;
- the implementation of projects which will be approved during the period 2003-2005;
- the reported (or estimated or extrapolated) ODS consumption during the period 1998-2000;
- the distribution of ODS by application sector; and
- the effectiveness of non-investment activities in reducing ODS consumption (see section 3 “Non-investment Projects” under the Cost Elements heading in ES.1 above).

3.5 Country Categories

In earlier replenishment studies, Article 5(1) countries were grouped into five Categories, according to their average CFC consumption level for the years 1995, 1996 and 1997 (their baseline consumption levels). These Categories have also been considered in the present study:

<i>Category 1:</i>	<i>> 5,200</i>	<i>ODP-tonnes;</i>
<i>Category 2:</i>	<i>1,000 – 5,200</i>	<i>ODP-tonnes;</i>
<i>Category 3:</i>	<i>360 – 1,000</i>	<i>ODP-tonnes;</i>
<i>Category 4, LVCs:</i>	<i>100 - 360</i>	<i>ODP-tonnes;</i>
<i>Category 5, VLVCs:</i>	<i>< 100</i>	<i>ODP-tonnes.</i>

For halons, three ranges were used, i.e. > 50, 10-50, and 0-10 ODP-tonnes, which leads to a subdivision in 3 Categories, the so called high, medium and low consuming countries:

<i>Category A:</i>	<i>> 50</i>	<i>ODP-tonnes;</i>
<i>Category B:</i>	<i>10-50</i>	<i>ODP-tonnes;</i>
<i>Category C:</i>	<i><10</i>	<i>ODP-tonnes.</i>

Countries in the Category A can be found in Category 1 and Category 2 given above for CFCs. The Categories 3, 4 and 5 (CFCs) are countries with a halon consumption (with a few exceptions) smaller than 10 ODP-tonnes, in many cases even with a consumption of 0 ODP-tonnes. Since the halon consumption is currently addressed via banking schemes, the subdivision given above is used in the halon banking analysis (see chapter 4: halon-banking analysis). This precludes the use of a spreadsheet approach.

In contrast to the earlier replenishment study, it was also decided to not use the spreadsheet approach for CTC and TCA (1,1,1 trichloro-ethane or methyl chloroform) due to significant uncertainty in the development of the consumption patterns for the years 1994-2000. Data for CTC consumption are only submitted by a very small number of countries, and then even with a significant uncertainty. A large number of countries only reports (very) small quantities for CTC and TCA, which implies that countries should be lumped (making a spreadsheet analysis superfluous).

The situation is different for methyl bromide where there is no direct relationship between the consumption of countries that are large CFC consumers and those that are large MB consumers. Countries were not subdivided in Country Categories, but the consumption patterns were analysed on a country-by-country-basis and the necessary reductions per country were determined (while taking into account the impact of the countries for which national sector or phase-out plans had been decided by the Executive Committee). Results following such an analysis may significantly differ from a lumped approach.

3.6 Modelling the Funding Requirement

A number of key factors as mentioned above are used in the calculation procedure that was developed and programmed as a spreadsheet model by the Task Force. As mentioned above, each country in the Categories 1 and 2 is modelled as a separate spreadsheet programme to reflect the individual circumstances of each country. The individual countries in Categories 3, 4 and 5 are consolidated into three groups for which three spreadsheets form the basis for calculations.

Each country has a specific sector distribution of ODS (CFC) use. These country specific data are available for all countries in Categories 1 and 2 from

the Country Programmes. However, these data are not available for all countries in Categories 3, 4 and 5 (although, again, progress has been made in the updating of country programmes since the year 1999 when the last replenishment study was carried out). To overcome this data problem, the Task Force grouped the available data and calculated their weighted average values for use in the spreadsheet models for the Categories 3, 4 and 5, respectively (it should be noted, however, that for the funding requirement determined for countries in Categories 4 and 5, no investment projects have been considered).

The implementation of projects in specific sectors can change a country's ODS sector distribution. The model takes these dynamic changes into account by recalculating this parameter as it identifies the appropriate mix of future projects. An explanation for how the programme deals with CFCs is given in Annex 5.

In the case of methyl bromide, a spreadsheet analysis has also to be made, given the fact that the analysis does have to take into account the same phenomena as in the case of CFCs, i.e. consumption data profiles, consumption growth until the freeze year, and possible reductions due to project implementation. This is especially important because 2002 is the freeze year and subsequent years have to deal with reduction steps. Since the implementation lag can be more than two years (i.e., the period before the entire project is implemented, or, when the planned ODP phase-out has been achieved), it is important to apply a spreadsheet analysis to analyse the effect of all variables. A spreadsheet model was developed on a country-by-country basis to provide estimates of the impact of project implementation on the methyl bromide consumption and the connected Multilateral Fund funding levels (while taking into account agreed sectoral or national phase-out plans and the funding agreed for them).

The freeze year for methyl bromide is the current year, 2002. However, the MB consumption for the year 2002 will not be known until after the completion of the replenishment study for the period 2003-2005 (actually, not until the year 2004). An explanation of the modelling approach used and an overview of all results for methyl bromide are presented in Annex 6.

4 The Funding Requirement for the 2003-2005 Replenishment; the Consumption Sector

4.1 Introduction to the Consumption Sector

This part of the current 2003-2005 Replenishment Study determines the necessary funding for the CFC consumption reduction steps during 2003-2005, for the 50% reduction in 2005, as well the funding for the subsequent CFC consumption reduction in the year 2007 to 15%. This funding needs to be addressed in the replenishment period 2003-2005 due to the implementation duration of projects. The Replenishment Study also deals with CTC and TCA, where the consumption of CTC has to be addressed concerning the reduction step of 85% by the year 2005 (compared to the baseline level that results from the average of the years 1998, 1999 and 2000) and also part of the consumption reduction to 100% by the year 2010, assuming a linear decrease. In the case of the TCA consumption, the reduction that has to be addressed concerns the 30% reduction compared to the baseline level in the year 2005 and part of the reduction towards the 70% reduction in the year 2010, assuming a linear decrease.

After the freeze methyl bromide (Annex E) in the year 2002, a 20% reduction is required in the year 2005, followed by further reductions towards the 2015 phase-out, i.e. part of the reduction by the year 2015 assuming a linear decrease in MB consumption over the period 2005-2015.

4.2 Investment Projects in the Consumption Sector

The estimated funding requirement for CFC consumption sector investment projects during 2003-2005 was in a first instance calculated using the spreadsheet model described in Annex 5. These estimates are based on:

- the control schedules presented in section 3.2 and in Annex 3;
- the consumption data submitted to UNEP (particularly for 1998-2000) /UNEP02/;
- the investment project approvals presented in Table A2.1;
- the investment project approvals for 2002 presented in Table A2.2;
- the implementation lags presented in Table A5.1;
- the average cost-effectiveness figures presented in Table A5.3.

Originally the spreadsheet analysis has been done separately for each of the countries in Categories 1 (3 countries) and 2 (11 countries). Countries in Categories 3, 4 and 5 were grouped together. The global Article 5(1) consumption calculated for Annex A substances (CFCs and halons) substances is presented in Annex 4.

The estimated funding requirement for the CTC and TCA consumption sector investment projects in the period 2003-2005 was calculated without using the spreadsheet approach. These estimates are based on:

- the control schedules presented in section 3.2 and in Annex 3;
- the consumption data submitted to UNEP (particularly for 1998-2000) /UNEP02/;
- the CTC and TCA investment projects approved so far;
- the implementation lags presented in Table A5.1 (as for CFCs);
- the average cost-effectiveness figures determined from the approval of (recent) projects, mainly in the Country Category 1.

4.3 Investment Projects in the CFC Sector; Spreadsheet Analysis

As mentioned above, the approvals for investment projects in the CFC consumption sector have been determined using the spreadsheet analysis.

However, there are differences with the study for the 2000-2002 replenishment. This is due to the fact that:

- (1) China's CFC consumption has been addressed in separate sectoral phase-out agreements with the Multilateral Fund Executive Committee. This implies that, although spreadsheet calculations can be done, it cannot have any impact on the level of funding already agreed to;
- (2) National CFC Phase-out Plans have been decided for a number of countries such as Malaysia, Thailand, Turkey and the Bahamas. This implies that for these countries the spreadsheet analysis is not useful (or rather, superfluous) since the amount of funding through the year 2009 has already been agreed upon.

The following procedure was therefore decided. Spreadsheet analyses were made for all countries except China. One type of spreadsheet analysis considered the historic approach of implementation lags, the second one used information on the delays in implementation (not implemented projects) and the consequences for the remaining consumption to be addressed. Results from both analyses were compared and conclusions regarding the funding requirement for the period 2003-2005 were drawn.

The results from the spreadsheet analyses for Malaysia and Thailand (using both the historic approach and the delay in project implementation, i.e. non-implemented projects) were compared with the amounts agreed upon by those countries in 2001 (Decision 35/53 and 35/54). From this comparison a certain factor can be determined which reflects the funding requirement that is calculated following the historic approach versus the funding agreed in the National Phase-out Plans.

Amounts in line with the agreements concluded for Malaysia and Thailand were then determined for those countries in the Categories 1, 2 and 3 that have no Phase-out Plans. Although their consumption patterns may be different, it still means the application of the same factor to the funding

requirement determined following the historic approach. The amounts determined are then subject to a number of considerations.

In section 4.4 the approved amounts for China are dealt with. In section 4.5 the National Phase-out Plans for Malaysia and Thailand are elaborated. Section 4.6 presents the results from the historic approach (historic cost-effectiveness data etc.) using the spreadsheet analysis. In section 4.6 a description is also given of the spreadsheet analysis approach on the consumption data for the year 2000 while subtracting a certain amount of ODS consumption for projects not implemented (using the same cost-effectiveness data). Section 4.6 subsequently presents a comparison of the results and concludes that further work is needed. In section 4.7 the results for the funding requirement are given in case many National Phase-out Plans would have been or would shortly be decided. Finally, the Task Force presents its best estimate, which is an average between two values determined for the funding requirement for all Article 5(1) countries except China, including the countries Malaysia, Thailand and Turkey.

4.4 Sectoral Agreements with China

In recent years, China has made a number of sectoral phase-out plans for ODS consumption with the Executive Committee, i.e., on commercial and industrial refrigeration, on polyurethane foams, on tobacco, and on solvents. In principle, however, if the agreements are taken together, it can almost be considered as a national phase-out plan.

Polyurethane

For the PUR foam sector, the plan intends to phase out 10,651 ODP-tonnes after receiving a certain amount of funding each year.

The Executive Committee Decision 35/48 gives a schedule for the phase-out with values of 2,500 ODP-tonnes to be phased out per year in the period 2003-2005. It also gives the funding amounts for the period 2003-2005, while mentioning “the Executive Committee also agrees in principle that the funds for the implementation of the annual programme for any given year will be provided at the last meeting of the Executive Committee in the preceding year, in accordance with the table”. In order to determine the funding required for the period 2003-2005, one has to take the years 2004-2006 as indicated in the relevant Decision. This leads to funding at a level of US\$25.126 million, with support costs at a level of US\$2.205 million (being 8.78%).

Tobacco

For the tobacco sector, the sectoral phase-out plan intends to phase out 1000 ODP-tonnes, related to a certain amount of funding per year.

The Executive Committee Decision 32/69 gives a schedule for the phase-out with values of 180, 200 and 200 ODP-tonnes to be phased out per year in the period 2003-2005. It also gives the funding amounts for the period 2003-2005, while mentioning “the Executive Committee agrees in principle that the funds will be provided on the basis of an annual work programme to be submitted at the first Executive Committee Meeting of each year, in accordance with, and in the exact amounts contained in the following schedule.....”.

In order to determine the funding required for the period 2003-2005, one has to take the years 2003-2005 as indicated in the relevant Decision. This leads to funding at a level of US\$5.10 million, with support costs at a level of US\$0.40 million (being 7.84%).

Table 4-1 CFC phase-out targets per year for the polyurethane, tobacco and solvent sectors; annual funding and support costs are also given (# =consumption).

POLYURETHANE			
Year	Phase-out target (ODP-tonnes/year)	Annual funding (* US\$1000)	Support Cost (* US\$1000)
2002	2,000	9,940	886.6
2003	2,500	12,570	1115.3
2004	2,500	10,903	961.27
2005	2,500	10,903	961.27
2006	600	3,320	282.8
TOBACCO			
2001	90	1,700	300
2002	120	1,700	300
2003	180	1,700	300
2004	200	1,700	100
2005	200	1,700	
SOLVENTS			
2000	600 (3,300#)	4,800	480
2001	500 (2,700#)	4,800	480
2002	500 (2,200#)	4,050	405
2003	500 (1,700#)	3,600	360
2004	600 (1,100#)	3,600	360
2005	550 (550#)	3,600	360

Solvents

For the solvent sector, the sectoral plan intends to phase out 11,550 ODP-tonnes of CFC-113, with a certain amount of funding per year. The sectoral plans also mentions TCA and CTC, however, these are dealt with below.

The Executive Committee Decision 30/56 gives a schedule for the CFC-113 phase-out with values of 1700-550 ODP-tonnes to be phased out per year in the period 2003-2005. It also gives the funding amounts for the period 2003-2005, while mentioning “....will be made available in January 2001, for the period January through December 2001.....”, and “....the Executive

Committee also agrees in principle that the funds will be provided on the basis of annual work programs submitted in accordance with”.

In order to determine the funding required for the period 2003-2005, one has to take the years 2003-2005 as indicated in the relevant Decision. This leads to funding at a level of US\$10.8 million, with support costs at a level of US\$1.08 million (being 10%, since the Decision mentions that UNDP has agreed to be the Implementing Agency for the first three years at a fee of 10% of the funds).

Refrigeration

China has proposed to phase down the CFC consumption in this sector via the submission of a large number of compressor projects for the commercial and industrial sector. The Executive Committee has approved a large number of projects over the years, with a terminal project approved at the 36th Executive Committee Meeting (March 2002) /ExC02/. In the context of these projects, it was agreed that 7,500 tonnes would be phased out in the commercial and industrial sector. For the Multilateral Fund replenishment for 2003-2005 this plan has therefore no direct impact.

Remaining Consumption

In Decision 35/48, on the phase-out in the PUR sector, an important paragraph can be found, which reads as follows:

"China acknowledges that approval and funding of this project will leave a residual amount of 18,441 ODP-tonnes of national aggregate consumption of CFCs that are unfunded (29,092 ODP-tonnes of CFC consumption after approved but unimplemented projects are netted out less 10,651 ODP-tonnes funded through this project). In addition, China acknowledges that implementation and subtraction of related reductions from the already approved tobacco sector project, solvents sector project and commercial refrigeration sector phase-out projects in accordance with agreements covering those sectors will result in a total level of CFCs remaining unfunded of 6,604 ODP-tonnes. (In the commercial refrigeration sector, it is assumed that agreed incremental cost for the remaining projects will be approved at the Thirty-sixth Meeting of the Executive Committee). Finally, China has acknowledged through this project that 1,859 ODP-tonnes of current CFC consumption in the foams sector are ineligible for Fund assistance because related capacity was installed after July of 1995. Therefore, China acknowledges that fulfilment of this foam sector project, together with the other projects noted above will leave China with a maximum level of further assistance aimed at reducing a residual of 4,745 ODP-tonnes of CFCs".

Decision 35/48 gives a value of 3,821 ODP-tonnes as the annual consumption limit in the polyurethane foam sector for the year 2007. It can further be assumed that there will be no consumption in the solvents and tobacco sector

in the year 2007. A reasonable assumption is that there will be a remaining (funded) consumption of 2,000 ODP-tonnes in the year 2007 in the refrigeration sector (commercial and industrial) which will be phased out in the period 2007-2009. This would imply that the consumption level for China in the year 2007 would be 10,566 ODP-tonnes (this can be calculated by adding up the amounts 4,745 plus 3,821 plus 2,000 ODP-tonnes). This amount is higher than 15% of the baseline level applicable to the year 2007 (i.e., 8,676 ODP-tonnes from a baseline of 57,840 ODP-tonnes). It can be calculated that 1,890 ODP-tonnes from the remaining 4,745 ODP-tonnes need therefore to be phased out in the triennium 2003-2005. Information from China /Zha02/ learns that this value represents consumption in the polystyrol / polyethylene and the domestic refrigeration sector, and particularly for MDI aerosol propellants.

If one would assume that 1,890 ODP-tonnes need to be addressed in projects during the triennium 2003-2005, at an average cost-effectiveness of US\$6.35/ODP-kg (average for China, see below), it would imply funding at a level of US\$12.00 million (with an assumed agency support cost of 10%).

In summary, via the sectoral agreements and via the phase-out of an additional --last portion of-- 1,890 ODP-tonnes there is a funding requirement for the triennium 2003-2005 for China of **US\$53.026 million** (with an additional US\$4.885 million agency support cost).

4.5 National Phase-out Plans

During the 35th Executive Committee meeting, two more or less similar national (terminal) phase-out plans were approved, i.e., plans for Malaysia and Thailand. Next to these plans two other national phase-out plans were decided, one for the Bahamas and the other for Turkey. The funding requirement for Turkey in the triennium 2003-2005 would be US\$2.5 million (US\$0.225 million agency support cost) and for the Bahamas it would be US\$0.320 million (US\$41,600 agency support cost).

Since the Bahamas is an LVC country which should address its consumption firstly via a Refrigerant Management Plan (Decision 31/48), and since the phase-out plan for Turkey concerns specific circumstances regarding the CFC consumption (refrigeration servicing sector profile for 1998-2000), these phase-out plans have not been analysed here in a first instance (see further below). Instead, this has been done for the plans for Malaysia and Thailand.

Although the plans for Malaysia and Thailand also consider the phase-out of TCA and CTC, only CFCs will be considered in a first instance here. Malaysia will phase out 1855 ODP tones of CFCs (next to 51 ODP-tonnes of TCA and 4.51 ODP-tonnes of CTC).

Table 4-2 Amounts agreed by the Executive Committee to be paid to Malaysia and to Thailand for their National Phase-out Plans. The third and fifth column show the amount that corresponds solely to a phase-out of CFCs.

Year	MALAYSIA		THAILAND	
	Amounts agreed to be paid (US\$)	Amounts for CFC (estimates) (US\$)	Amounts agreed to be paid (US\$)	Amounts for CFC (estimates) (US\$)
2001	1,799,940	1,751,830	540,000	504,010
2002	2,969,065	2,920,950	5,194,380	5,158,400
2003	2,013,100	1,964,990	4,011,846	3,975,860
2004	1,688,300	1,640,190	1,315,400	1,279,410
2005	1,208,300	1,160,190	1,330,400	1,294,420
2006	1,013,300	965,190	851,600	815,610
2007	275,000	226,900	550,000	514,010
2008	275,000	226,900	550,000	514,010
2009	275,000	226,900	385,000	349,030
2010				
Totals	11,517,005	11,084,040	14,728,626	14,404,760

The amounts agreed per year for Malaysia are given in the table above (i.e., the column with the amounts to be paid per year for the phase-out of all three substances, CFCs, TCA and CTC, at a total of US\$11,517,005).

The Task Force has also calculated amounts for the CFC phase-out only, by subtracting the amounts for TCA and CTC, simply at a cost effectiveness level of US\$7.8/ODP-kg (being about 80% of the average cost effectiveness for CTC solvent projects). In this case the total amount would be US\$11,084,040. From the values given above the value of US\$5.98/ODP-kg for the cost-effectiveness of the CFC phase-out can be calculated. This value has been determined from the totals for funding for CFCs and for the total amount of ODP-tonnes of CFCs (one cannot take the amounts for a given year since the funding profile is not equal to the CFC phase-down profile).

A similar exercise has been done for the National Phase-out Plan agreed to by Thailand. Thailand agreed to phase out 3066 ODP tones of CFCs, 34 ODP tones of TCA, and 7.52 ODP-tonnes of CTC. The total funding agreed to in this case is US\$14,728,626. This amount is reduced to US\$14,404,770, when corrected for the solvents contribution; this lower figure would then apply to CFCs only. This would yield a cost effectiveness calculated from the total amounts of US\$4.70/ODP-kg for CFCs. The same comments as in the case of Malaysia apply.

The funding agreed for the triennium 2003-2005 for Malaysia and Thailand is US\$4.765 million and US\$6.550 million, respectively. The relevant Decision says that the World Bank has agreed to be the Implementing Agency for this project at a fee of 5 percent for the project implementation and the monitoring and 9 percent for all other investment activities (which are at a level of about

US\$9.70 million, following consultations with the MLF secretariat). This implies that the overall agency support costs for these projects are 8.2%.

4.6 Spreadsheet Analysis

Analysis 1; Historic Approach

The spreadsheet model has been applied for CFCs to all countries in the Categories 1, 2 and 3. It has been assumed that the consumption of the LVC and VLVC countries (Categories 4 and 5) is covered under the Refrigerant Management Plans (Decision 31/48) and that therefore no extra funding is required. However, it may be that, under certain circumstances, project approvals would be needed for countries in these categories in other sectors than refrigeration. Due to the grouping of the countries in the two categories, the Task Force has not been able to derive a funding requirement for the period 2003-2005, however, if considered on a country-by-country basis a certain funding requirement could be determined (order of magnitude US\$1-3 million). This has not been further evaluated at this stage.

Table 4-3 Amounts (in US\$1000) determined as required for the funding of CFC projects in 2003-2005 according a spreadsheet analysis following the historic approach and using the cost effectiveness values as determined for the different country categories (with the agreed values for Malaysia and Thailand separately given).

Investments (* US\$1000)	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
All countries minus China						
Analysis 1	68,669	185,213	38,977	0		307,244
Historic	6,656	7,409			320	
(+agreed NPP values)	<i>(Thailand)</i>	<i>(Malaysia & Turkey)</i>			<i>(Bahamas)</i>	

Note: The values agreed for Thailand, Malaysia/Turkey and for the Bahamas for the triennium 2003-2005 (for the National Phase-out Plans) are part of the amounts in Categories 1, 2 and 5. In fact, the value in Category 5 is for the Bahamas only (US\$320,000).

The spreadsheet calculation for the Categories 1,2 and 3 starts from the CFC consumption data reported before 2000 (i.e., 1994-2000), and assumes that all projects approved (or to be approved) during 1994-2001 (2002) had been completed (if approved long ago) or are going to be completed according to the implementation lag (see Annex 5).

The model used cost-effectiveness factors for the different country categories derived from the approved projects during the period 1998-2001, and averaged on a project by project basis (see Annex 5). The calculation was based on required compliance with the Montreal Protocol in the year 2005 (50% reduction) and in the year 2007 (85% reduction).

Results are presented in Table 4-3 for the different Country Categories. Excluding the amounts agreed for China, but including the amounts agreed in National Phase-out Plans (US\$14.385 million), the total amounts to US\$307.264 million.

Analysis 2; Remaining Consumption

Information from the Multilateral Fund Secretariat /MFS02/ yields that several projects approved in the past (and possibly assumed to be completed in Analysis 1 above) had not yet been completed. This, of course, is the case for the majority of projects approved in the period 1999-2001 (due to the implementation lag), but it also applies to projects approved earlier.

Since the Task Force could not complete a spreadsheet with all applicable historic information (on a country by country and project by project basis) a different investigation was performed. It consisted of the determination of the funding requirement for the period 2003-2005 on the basis of the CFC consumption data reported for the year 2000 minus the amounts not implemented from approved projects.

It is in fact a combination of a lumped approach for the past and a spreadsheet analysis with implementation lags for future approvals, which then includes the 2002 approvals as included in the 2002 Business Plan of the Agencies. This analysis is to a certain degree comparable to the "Option 2" as described in Decision 35/57.

However, it should be underlined that here the funding requirement for the period 2003-2005 is determined, and not the remaining consumption to be funded (as mentioned under "Option 2" in Decision 35/57).

Countries in the Categories 1, 2 and 3 were analysed, and average sector distributions were determined. The same cost effectiveness factors were used for the countries in the different Categories as in the analysis 1 described above. The results are given in Table 4-4.

Table 4-4 Amounts (in US\$1000) determined as required for the funding of CFC projects during 2003-2005 according to an approach that (i) departs from reported 2000 consumption data, (ii) considers the remaining consumption after the implementation of all projects not implemented through the year 2001, and (iii) consists of a spreadsheet analysis for the future (with the agreed values for Malaysia and Thailand separately mentioned). Cost effectiveness factors were the same as used in Analysis 1 “historic approach”. In the total amount the amounts for the agreed National Phase-out Plans have been included.

Investments (* US\$1000)	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
All countries minus China						
Analysis 2	58,181	137,714	36,004	0		246,284
Remaining Consumption (+agreed NPP values)	6,656 <i>(Thailand)</i>	7,409 <i>(Malaysia & Turkey)</i>			320 <i>(Bahamas)</i>	

As can be seen in Table 4-4 the total amount is different from the amount in Table 4-3 (about 20%), however, tendencies in the different country categories are, of course, consistent (mainly dependent on the size of the consumption in the different Categories). This implies that the results of both methods can be compared (i.e. the lumped approach for the historic development has no influence on the spreadsheet analysis for the future). The difference can most reasonably be assumed to originate from projects still to be implemented that were assumed as already implemented under Analysis 1, “historic approach”.

Dependent on the remaining application sectors in the countries one may easily determine cost effectiveness factors that are different from the ones used in the two calculations above. E.g. the remaining consumption in the countries with a large refrigeration sector (which holds for the larger part of all the countries in all categories) will mainly consist of servicing activities, where the cost effectiveness value will be lower than for refrigeration investment projects. Dependent on the application sector “mix” in countries and on the percentage servicing in the total of all refrigeration activities, it is possible to make a rough estimate for the funding requirement during the period 2003-2005. Values may vary between US\$160 million and US\$220 million (these values include the funding requirement needed for the agreed National Phase-out Plans).

The Task Force has critically considered the above results. It is logical that, with increasing experience on the implementation of projects (experience that was not or less available in 1999 when the last Replenishment Study /RTF99/ was done) the formal “historic approach” has shortcomings and one needs to take into account more detailed knowledge on a country by country (and

project by project) basis. The Task Force is of the opinion that the data from the Multilateral Fund Secretariat on reported remaining consumption (consumption minus the information on ODP-tonnes approved and not implemented etc.) form the most adequate basis from a data analysis point of view, while basing itself on country reports. However, arguments need to be mentioned such as:

- Country reports on implementation in many cases do not include the pattern through the years 1999-2001 (where 2001/2002 consumption patterns have been extrapolated by the Task Force);
- The country reports on the sectors in which the remaining consumption is to be found may not be up to date in all cases since there will be a reporting delay (compare UNEP reporting of country consumption data);
- The consumption in countries may have increased up through the freeze year following an increase in the needs for servicing which may so far not have been reported;
- There may be deviations from the values determined in a number of countries due to a number of different reasons which are difficult to qualify (this will particularly be the case for countries where the 2000 consumption is considerably higher than the 1995-1997 baseline in spite of the implementation of projects).

Furthermore, the Task Force realises that it is too early to actually determine the funding requirement for CFCs following one approach which is to a large degree comparable to Option 2 as given in Decision 35/57 (and not to Option 1 as in Decision 35/57).

It may well be that in the near future all Article 5(1) Parties will have selected the option (either Option 1 or 2) that they think is best for them regarding the remaining consumption to be funded. Whether one would take one option for all countries, or a mix of options could lead to substantial differences in the amount of funding required.

It should also be underlined that for an accurate determination of the funding requirement, up to date information needs to be available on the consumption in the different application sectors in the year for which the relevant consumption is reported.

The Task Force, given the timeframe available to conduct the study, did not have the opportunity to investigate all the issues on a country by country basis, in particular via discussions with the countries concerned, after that the countries would have analysed the consequences of Decision 35/57 (i.e. the selection of either Option 1 or Option 2). It needs to be emphasised therefore that this area needs further analysing work.

Furthermore, in the report of the 35th Executive Committee meeting, in relation to Decision 35/57, it is mentioned that “.....Concerning the impact of this decision on the upcoming replenishment of the Multilateral Fund, the

group had noted that the Technology and Economic Assessment Panel had traditionally used historical data, and it was likely to use the latest available data for its upcoming analysis. In any case, there could be sensitivity analysis, regardless of the data used by the Panel". Given this statement, the Task Force decided to not further deal, within the framework of this study, with considerations regarding the consequences of the "remaining consumption approach" on a possible funding requirement.

It should be emphasised that the amounts determined in Analysis 1 and in the first calculation presented in Analysis 2 are based on cost effectiveness factors as determined from the approvals during the period 1998-2001. In 2001, National Phase-out Plans were decided, as mentioned in section 4.5, which yield different cost effectiveness values. In section 4.7 possible consequences of this NPP strategy have therefore been further analysed.

4.7 Spreadsheet Analysis Compared to National Phase-out Plans

One can perform a spreadsheet calculation for Malaysia and Thailand using the historic approach (given above as Analysis 1, i.e., consumption data reported, cost effectiveness per project etc.), calculate the amount of funding required and compare it to the amount of funding agreed to in the National Phase-out Plans.

The spreadsheet analysis for Malaysia and Thailand calculates roughly the same CFC consumption levels for the year 2002 as in the National Phase-out Plan (slightly lower due to some project implementation from earlier years) and can therefore be used for a comparison.

If the funding is calculated through the year 2005, without taking into account the amount phased out in the National Phase-out Plans for the year 2002 only, the funding calculated can be compared to the funding agreed for the triennium 2003-2005. The funding determined in the spreadsheet analysis for Malaysia is equal to US\$15.4 million (applying conservative cost effectiveness estimates and a slightly different funding profile than in the National Phase-out Plan), whilst the funding in the Phase-out Plan through the year 2005 amounts to US\$8.287 million. This yields a ratio of 0.54 between the two types of funding. In the case of Thailand, a similar comparison yields that this factor equals 0.43. Because of different sector profiles in Malaysia and Thailand, the weighted average has been determined, yielding a value of 0.484.

The above implies that one can apply an average factor of 0.484 to the results as presented for the different country categories in Table 4-3 (excluding the amounts agreed for the National Phase-out Plans). In this way it is possible to derive the funding requirement for 2003-2005 if all countries would have the --average-- cost effectiveness agreed in National Phase-out Plans such as

Malaysia and Thailand (being less than 50% of the average cost effectiveness figures of the historic approach).

However, it is reasonable to assume that many, but not all countries will have National Phase-out Plans agreed before 2003-2005, or at an early stage. It is the Replenishment Task Force's best estimate that the funding value for addressing the CFC consumption during the triennium 2003-2005 would fall between the "National Phase-out Plan values" (with the reduction in cost effectiveness values as for Malaysia and Thailand for all countries that are non-LVCs) and a value based upon the (conservative) "historic approach" determined in the spreadsheet analysis (see Analysis 1, above).

Lower Level of the Funding Requirement

The Task Force's best estimate is 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 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 plans including the total refrigeration sector. In many cases this is the major sector remaining. Table 4-5 gives the amounts determined based upon the above considerations, i.e., for the case that countries as mentioned above would have National Phase-out Plans, comparable to Malaysia and Thailand. This presents the lower level of the funding requirement.

Upper Level of the Funding Requirement

In section 4.5 it was mentioned that "...dependent on the remaining application sectors in the countries one may easily determine cost effectiveness figures that are different from the ones used in the two (historic data based) calculations....". The following has therefore been considered.

Compared to the "historic approach" it can be assumed that the cost effectiveness figures will be lower in the near future. This will be mainly caused by the fact that the manufacturing sector for domestic and commercial refrigeration will have been covered by projects in all Article 5(1) countries, and it will be the servicing sector that remains. If one e.g. takes the servicing phase-out project for Turkey and other servicing investment projects (within the framework of RMPs) the cost effectiveness is in the order of US\$8.7-9.3. This implies roughly a decrease 30-45% compared to the historic cost effectiveness values for the refrigeration sector in the different Country Categories. The decrease will be lower for smaller countries specifically in Category 3, although this is difficult to determine at this stage lacking information. Whether the reduction for foam and other sub-sectors will be

significant is difficult to determine (sectoral agreements show decreases, but not of the same magnitude as in the case of refrigeration, i.e. when going from manufacturing to servicing only).

Rather than continuing with the values from the historic approach (the total being US\$307 million), it is the best estimate of the Task Force to use as the upper level for the funding requirement the values given in Table 4-3 multiplied by 0.67 (i.e. an “overall” reduction of one third, i.e., 33%), and this excluding the values agreed in the National Phase-out Plans. Results are also given in Table 4-5; they present the upper level for the funding requirement.

Table 4-5 Funding requirement (in US\$1000) determined for the funding of CFC projects using the (historic) values from Table 4-3 (ii) using the assumption that all countries have the NPP approach, (iii) using the assumption that 67% of the cost effectiveness of the historic approach applies to all countries, (iv) using the assumption that a large portion of all countries have NPP approaches (cost effectiveness factors as agreed for Malaysia and Thailand) and the remainder is determined from the historic approach with adjusted CE values. The last row gives the Task Force’s best estimate being the average between the two cases (iii) and (iv) (in all cases the agreed NPP values have been kept the same).

Investments (* US\$1000)	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	Total
All countries minus China						
Historic Approach +NPP values (Table 4-3)	75,325	192,622	38,977	0	320	307,244
All Countries NPP Approach	39,892	97,052	18,865	0	320	156,129
Adjusted CE Historic Approach +NPP values	52,664	131,502	26,115	0	320	210,601
Countries having NPP Approach, different in the different Groups	39,892	100,497	21,765	0	320	162,474
Average	46,278	115,999	23,940	0	320	186,537

Note: The values agreed for Thailand, Malaysia/Turkey and for the Bahamas for the triennium 2003-2005 (for the National Phase-out Plans) are part of the amounts in Groups 1, 2 and 5. In fact, the value in Group 5 is for the Bahamas only (US\$320,000).

Note: For the National Phaseout Plans in Malaysia and Thailand an agency support cost (overall) of 8.2% was decided. A fee of 9% was agreed by the World Bank as an Implementing Agency for Turkey, 13% was agreed by the same agency for the Bahamas.

Note: For all other countries that are assumed to follow the NPP Approach an agency support cost of 8.2% is assumed, and 11% for the conservative project-by-project approach.

Average Level of the Funding Requirement

Table 4-5 gives the amounts for

1. the case projects in all countries can be addressed via cost effectiveness figures, which are 67% of the ones determined via the “historic approach”;
2. the case the majority of countries have NPP “approaches” comparable to Malaysia and Thailand, and the remainder of the countries can be addressed via the cost effectiveness figures under (1);
3. the average of the values given under (1) and (2).

The total then amounts to **US\$186,537 million**, and this excludes the plans agreed for China. In case of the value of US\$186,537 million the agency support cost can be calculated from the two cases between which is averaged.

Support costs are as follows:

- US\$4.904 million in Category 1;
- US\$12.399 million in Category 2;
- US\$2.487 million in Category 3; and
- US\$0.042 million in Category 5,

which brings the total to US\$19.832 million. In case of the agreed National Phase-out Plans the agency support costs that were agreed have been included in the above mentioned amounts.

However, at this stage the Task Force has not enough supporting material that it can maintain that the average value will be the only value applicable. This is caused by the large spread in cost effectiveness factors that one can apply and furthermore, the cost effectiveness factors derived from the existing Malaysia and Thailand National Phase-out Plans only do not have a statistical basis that is sound enough.

It is for this reason that the Replenishment Task Force, after substantial discussion, has decided to give an additional uncertainty to the above mentioned value of US\$186.537 million (i.e. covering the lower and upper level of the funding requirement determined above). This uncertainty would amount to **US\$24.1 million**. The uncertainty range of two times US\$24.1 million would then also cover the projects that could possibly have been required for countries in the Categories 4 and 5; these could not be precisely calculated due to the grouping of the countries in these Categories (projects not covering the refrigeration and its servicing sector). In this value of US\$24.1 million agency support costs of US\$2.6 million are not included; in fact, one could attach an uncertainty of **US\$26.7 million** to the total funding requirement calculated below (see chapter 7).

4.8 Chiller Projects

During the years 1998-1999, two chiller demonstration projects were decided (i.e., for Thailand and Mexico) which required US\$2.5 million from the Multilateral Fund (and an equal amount from the GEF) to start a revolving fund for the financing of extra chiller conversions from savings in the electricity consumption of the new chillers installed. Information so far is that both projects, although maybe delayed, are successful in achieving certain targets. Information can be taken from the IA Business Plans that chiller (demonstration) projects are planned on the same basis for a number of countries, to be started in 2002, but in particular for the period 2003-2005. Because these plans will phase out a certain amount of CFCs, they could therefore be considered as consumption phase-out projects.

However, these cannot be directly compared to projects following the historic approach and the cost effectiveness value, since they are aimed at starting a revolving fund. They should therefore be considered additional to the amount of funding determined for the CFC consumption sector during 2003-2005. It is the Task Force's best judgement to conclude a funding requirement for three of those projects, which amounts to the total of US\$7.5 million. It is assumed here that one of the amounts made available in the past (one time US\$2.5 million) will be paid back in this triennium, resulting in a US\$5.0 million net funding requirement. It is assumed that an agency fee of 9% would apply to the three projects (US\$675,000).

4.9 Investment Projects in the MB Consumption Sector

The analysis in the MB sector was made on a country-by-country basis. The Ozone Secretariat consumption data (primarily the data for 2000) was used to calculate the total MB, and tonnes to be eliminated to meet the freeze and 20% reduction step for each country. A database was also made of the approved MB investment (phase out) projects, identifying the scheduled MB reductions and funding tranches allocated per year, as in the project conditions stated in reports of Executive Committee meetings. This was used for calculating the cost-effectiveness values, as well as the tonnage and funding in the period 2003-05 for existing investment projects. When calculating MB reductions to meet the freeze and 20% reduction, full account was taken of the approved investment projects and proposed investment projects due to be approved during 2002.

The quantity of MB to be addressed in the next triennium was calculated by examining the following:

- MB scheduled for phase-out in approved MB investment projects;
- Proposed new MB investment projects in MLF Business Plan for 2002;
- MB reductions necessary to achieve the freeze;
- MB reductions to meet the 20% reduction in 2005;

- The time-lag between project approval and actual MB reductions;
- MB reductions due to the time-lag between project approval and MB reductions;
- The status of ratification of the Copenhagen Amendment.

The average cost-effectiveness value of approved MB investment projects was calculated and used as a basis for calculating the funding needs for the next triennium. Annex 6 on the MB sector calculations provides the details of the method and analysis employed.

The data for this analysis come from three sources: (i) Ozone Secretariat consumption data, (ii) MB investment project agreements in reports of Executive Committee meetings, and (iii) the MLF Business Plan for 2002. The data is supported by responses to the questionnaire sent out as part of data gathering for this study (see Appendix).

About 102 Article 5(1) countries have ratified the Copenhagen Amendment. Of the 36 that have not ratified, only 11 consume MB, and only one country (China) has significant MB consumption. China has written officially to the Ozone Secretariat stating its intention to ratify by the end of 2002. Several other countries plan to ratify in the year 2002. The analysis therefore assumed that all the MB-consuming countries will ratify the Copenhagen Amendment and be eligible for MLF assistance in the next triennium.

Total Amount of Methyl Bromide

The total amount of MB to be phased out was calculated from the Ozone Secretariat data and the Executive Committee reports on approved MB investment projects. Details on the MB sector calculation method can be found in Annex 6. The initial total MB consumption was at least 9,791 ODP-tonnes, before the impact of MB investment projects approved to date. This is a calculated value, it is not the reported consumption for the year 2000 (As outlined in section 2.3, the total reported to the Ozone Secretariat to date is 9,185 ODP-tonnes; MBTOC has estimated at least 9,425 ODP-tonnes, noting that it may have been as high as 10,000 ODP-tonnes).

Approved Investment Projects

Funds from the current and past replenishment periods (1998-2002) are scheduled to eliminate 1,703 ODP-tonnes in 27 approved MB investment (phase-out) projects. Eight of the projects are funded in tranches, and are scheduled to eliminate a further 1,351 ODP-tonnes utilising funds in the 2003-2005 triennium, and 57 ODP-tonnes in the 2006-2008 triennium.

Proposed New Projects in 2002

The 2002 Business Plan of the Multilateral Fund listed new MB investment and non-investment projects expected to be approved in 2002. Analysis of the projects indicates that MB reductions of approximately 933 ODP-tonnes

are due to be funded in the current replenishment period (2000-2002), while reductions of approximately 968 ODP-tonnes are due to be funded in the triennium 2003-2005 in multi-year projects.

Reductions to Achieve the Freeze

The Montreal Protocol requires Article 5(1) Parties to freeze consumption of MB in 2002. The Ozone Secretariat data was used to calculate necessary MB reductions for each country, giving a total of about 1,463 ODP-tonnes that needs to be eliminated to meet the freeze. (The 21 countries, which already have MB investment projects were not included in this analysis because their freeze reductions are already counted in the section about approved projects above.) However, the new investment projects proposed for 2002 will eliminate approximately 339 ODP-tonnes to help meet the freeze (analysed on a country-by-country basis) so the MB reductions required to meet the freeze are adjusted to 1,124 ODP-tonnes (i.e., 1,463 minus 339).

The TEAP Task Force notes with concern that about 36 Article 5(1) countries, which do not have investment projects, need to make MB reductions in 2002 to meet the freeze on time. Only about 11 of these countries have investment projects listed in the Business Plan for 2002, so additional action will be important for compliance.

The 20% Reduction Step

The Montreal Protocol requires Article 5(1) Parties to reduce MB consumption to 80% of the Baseline in 2005. Country-by-country analysis shows that at least 610 ODP-tonnes need to be eliminated, after deducting the impact of approved investment projects. The proposed new investment projects in the MLF Business Plan would enable certain countries to achieve the 20% reduction, eliminating 224 of the 610 ODP-tonnes mentioned above. This means that funds will be required in 2003-2005 for MB reductions of 386 ODP-tonnes (i.e., 610 minus 224) to meet the 20% reduction.

Reductions Due to Time-lag

In existing MB investment projects there is a time lag of up to 2 years between project approval and first MB reductions, and a time-lag of 2-6 years between project approval and final MB reductions. So the triennium 2003-2005 will necessarily cover some MB reductions after 2005. Assuming an annual MB reduction rate of 8%, the MB reductions were estimated to be 2 years times 8% of the 3,326 ODP-tonnes of MB remaining. The resulting 532 ODP-tonnes were adjusted to 475 ODP-tonnes (i.e., 532 minus 57) to take account of the 57 ODP-tonnes that will be funded by existing investment projects after 2005.

In making these calculations, the Task Force did not take account of the fact that the Parties are due to review the Montreal Protocol's Article 5(1) MB

reduction schedule in 2003 under Decision IX/5, because it is not feasible to predict the outcome of the Parties' discussion on this issue.

Summary of MB Reductions

Table 4-6 below provides a summary of the MB reductions that need to be covered in the next replenishment period. The calculations indicate that the total quantity of MB to be eliminated in the next replenishment period is about 4,304 ODP-tonnes.

Table 4-6 *Summary of necessary MB reductions in the next replenishment period*

<i>MB reduction activities</i>	<i>MB tonnes (ODP-tonnes)</i>
Reductions in 2003-05 scheduled in MB investment projects approved already	1,351
Reductions in 2003-05 from proposed MB investment projects planned for approval during 2002 (including reductions of at least 563 ODP-tonnes necessary for the freeze and the 20% reduction (a))	968
Reductions to achieve the freeze (after 2002 only), after deducting existing and proposed projects	1,124
Reductions to meet the 20% cut in 2005, after deducting existing and proposed projects	386
Reductions due to time-lag between funding and actual MB reductions	475
Total	4,304

(a) i.e., 339 ODP-tonnes (freeze) +224 ODP-tonnes (20% cut) = 563 ODP-tonnes in planned projects

Replenishment Calculation

To calculate the replenishment for the MB consumption sector, the averages (means) of the cost effectiveness values for existing investment projects (approved by February 2002) were examined. The arithmetic mean is US\$22.8 per ODP-kg. However, the distribution of values is not a statistically normal distribution, so it is more appropriate to use the geometric mean, which was US\$18.0 per ODP-kg. The funds required in the next triennium, summarised in Table 4-7, are estimated to be \$64,879,917 (to this amount agency support costs at 11% apply).

The analysis assumed that proposed projects for 2002 in the draft MLF Business Plan will be approved in 2002. If any of the projects are not approved in 2002, the MB tonnage and costs need to be carried forward to 2003 and added to the replenishment total.

When considering cost-effectiveness values it was noted that large MB phase-out projects normally have cost-effectiveness values less than US\$18.0, but many large MB consuming-countries already have investment projects, so the vast majority of future MB projects will be for small and medium consumers where the cost-effectiveness value tends to be significantly higher than US\$18.0. The analysis showed that the sectors of tobacco seedbeds, post-harvest and structures generally have significantly higher cost-effectiveness values also. The spread in cost-effectiveness values achieved for different MB projects is illustrated in Figure A6-1 in Appendix 6.

The analysis may have under-estimated slightly the quantity of MB that needs to be reduced to meet the freeze, because the data was incomplete in some cases.

The calculations were made on the basis of the current official ODP of 0.6. If this is changed in future, the replenishment would need to be adjusted proportionately because the incremental costs of alternative equipment, materials and training will remain the same irrespective of changes in ODP values.

Table 4-7 Calculation of replenishment in the MB sector (a)

<i>MB phase-out activities</i>	<i>MB reductions (ODP-tonnes)</i>	<i>Cost-effectiveness value (US\$ per ODP-kg)</i>	<i>Estimated replenishment in 2003-05 (US\$)</i>
Approved investment projects	1,351	-	11,725,917 (b)
Proposed investment projects	968	18	17,424,000
Freeze	1,124	18	20,232,000
20% cut	386	18	6,948,000
Time-lag	475	18	8,550,000
Total	4,304		64,879,917

- (a) The details of calculations are presented in the Annex 6 on MB sector calculations.
 (b) Calculated from project agreements specified in reports of ExCom meetings.

4.10 Investment Projects in the CTC Consumption Sector

Values for the CTC consumption in all Article 5(1) countries (that apply for funding) have been given in Table 2-1. These amounts are based on the values reported to UNEP by all Article 5(1) countries through the year 2000. However, these values have been corrected for anomalies in the reporting, particularly by CFC producing countries, which are probably due to feedstock reporting.

One could calculate the baseline for CTC production per country (the average value over the years 1998, 1999 and 2000), or as a global figure. It is,

however, not certain which uses are covered in the reporting. It may apply to solvents, it may also apply to CTC process agents in uses covered in Decision X/14 and to CTC process agents in uses not covered in Decision X/14.

The amount of CTC used for process agents can be based upon the estimate in the PATF report of 1997 /PATF97/ which mentions a use of 7,000 ODP-tonnes of CTC as a process agent (in uses approved). In the present Task Force report it is assumed that the consumption for this use has increased from 7,000 to 8,000 ODP-tonnes as a baseline (for the period 1998-2000).

It is assumed that the majority of this process agent use can be found in China and India, with minor use in countries that report smaller quantities of CTC consumption. A Chinese study has reported on the use of process agents in China for uses approved in Decision X/14, which use would be in the range 3,000-3,500 ODP-tonnes /SEPA02b/ (this report /SEPA02b/ mentions a total of 9,000 ODP-tonnes for all process agent uses in China, i.e. also for the uses not approved in Decision X/14). Apart from these figures no further data from other countries have so far been reported. It is the Task Force's conviction that a reliable figure cannot be obtained until auditing procedures in China and India (and possibly elsewhere) have been completed. These auditing procedures are currently underway and, if possible, the Task Force will revise its figures accordingly, if results from these auditing procedures would become available.

From the *Inventory of Approved Projects (as at December 2001)* /IAP02/ it can be derived that 1,095 ODP-tonnes of CTC have been addressed in projects during 2000/2001, which originally have contributed to the baseline.

Departing from a baseline use of 8,000 ODP-tonnes in process agents, it can be calculated that 6,195 ODP-tonnes of CTC (i.e., 7,280 minus 1,095 ODP-tonnes) have to be addressed during the triennium 2003-2005 (this takes into account the 85% reduction step in 2005 and linear decrease through 2007 towards the phase-out in 2010).

As far as information has been available to the Task Force on CTC solvents /ATOC98/, one can assume a use of 1,800 tonnes of CTC in cleaning processes, which would require equipment conversion if the use of CTC needs to be phased out. This implies that, in the triennium 2003-2005, about 1,530 ODP-tonnes (i.e., 1,640 minus 110 ODP-tonnes in the Chinese sectoral plan) need to be addressed in solvent projects (i.e. for the 85% reduction in 2005 and a linear decrease through 2007 towards the phase-out in 2010).

Cost effectiveness factors so far known are US\$5.68/ODP-kg for process agents and US\$9.49/ODP-kg for solvent or cleaning agent uses. These values are the averages of the cost effectiveness figures derived from the separate

CTC projects approved during recent years, through December 2001, by the Multilateral Fund Executive Committee /MFS02/.

This would then bring the funding amount to US\$35.188 million for process agent phase-out and to US\$14.520 million for CTC solvent phase-out, bringing the total to **US\$49.708 million**. The agency support cost is difficult to determine, however, an average value of 9% seems to be appropriate (US\$4.474 million). In the above amounts the funding agreed for the phase-down of CTC in Malaysia's and Thailand's phase-out plan (phase-out of a total of 12 ODP-tonnes) is not assumed to be included.

4.11 Investment Projects in the TCA Consumption Sector

Where it concerns the application of TCA as a solvent, reasonable quality data exist, which have so far been reported to UNEP. Here the baseline is again (as for CTC) the average of the consumption during the years 1998, 1999 and 2000. Where the freeze will be in the year 2003, an additional 30% reduction is prescribed for the year 2005 and additional reductions through 2007 are to be considered towards the 70% reduction in consumption by the year 2010. This implies that somewhat less than 50% of the global consumption (minus China's consumption, which is addressed in a sectoral phase-out plan) needs to be addressed in the triennium 2003-2005. Where it concerns cost effectiveness of projects little is known from experience; the Task Force has estimated a cost-effectiveness of US\$19.25/ODP-kg here, half the cost effectiveness threshold value decided by the Executive Committee.

The "global" baseline for TCA is calculated to be 1330 ODP-tonnes, including China. Subtracting the Chinese data, one calculates the baseline as 583.3 ODP-tonnes. It implies that the consumption level in 2007 (assuming a linear decrease between 2005 and 2007, towards the 70% reduction in 2010) will be (if it could be defined at the global level) 315 ODP-tonnes. Taking the 2000 global (minus China) consumption level, approximately 160 ODP-tonnes need to be phased out. The funding requirement, at the cost effectiveness of US\$19.25 (about half the threshold value), would then be a total of **US\$3.080 million**. For these projects (which will generally be small in nature) an agency support cost of 12% has been estimated (US\$0.37 million).

4.12 Total Funding Requirement for the ODS Consumption Sector

From the amounts given in the paragraphs above for the Chinese sectoral phase-out plans, the National Phase-out Plans, and for the projects in the CFC, TCA and CTC sectors the total funding requirement for the triennium 2003-2005 for the consumption sector can be determined. This is presented in this chapter and a summary of the values is given in Table 4-8 below.

In the table separate lines have been added for the funding agreed for the CTC and TCA chemicals in the sectoral phase-out project in China for the triennium 2003-2005, being US\$0.725 and US\$4.365 million, respectively (with agency support costs of US\$0.073 and US\$0.437 million, respectively). There has also been added the amounts for CTC and TCA agreed for Malaysia and Thailand.

In the table halon projects are not given, since it is expected that in future every reduction in halon consumption will be addressed under halon banking schemes (which is addressed under “non-investment projects”, chapter 6).

Table 4-8 Total funding requirement for all ODS consumption sectors in the 2003-2005 replenishment period (in US\$ million) in order to meet the different control schedules by the separate Categories of countries. Values given in the table include the values for Malaysia and Thailand for the CFC consumption sector; for CTC and TCA a separate value has been given. Category 1 does not include China; China has been given in a separate column, due to the separate sectoral agreements

Countries	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	China	Total
CFCs	46.278	115.999	23.940	0	0.320	53.026	239.563
CFCs Chillers	5.000						5.000
CTC	49.708					0.725	50.433
TCA	3.080					4.365	7.445
CTC/TCA Mal/Thai							0.252
MB Global	64.879						64.879
Total							367.572

The total estimated funding requirement for the CFC consumption sector investment projects (whether or not imbedded in a National Phase-out Plan) for the period 2003-2005 is **US\$239.6 million**. This estimate is obtained taking into account

- the spreadsheet model calculations per country category;
- the costs as presented in National Phase-out Plans;
- expectations regarding the cost development, going from a project-by-project approach to a sectoral or National Phase-out Plan approach;
- the range of costs between the amount determined in spreadsheet calculations using conservative cost-effectiveness factors and cost-effectiveness factors from National Phase-out Plans;
- the costs of the agreements made with China in sectoral phase-out plans.

However, the Task Force has not been able to give a point estimate for funding requirement for CFC investment projects, and has therefore proposed to add a US\$24 million uncertainty to the estimate given above (it implies that one considers the range US\$216-264 million for the CFC related funding requirement).

The CFC investment projects will phase out roughly 24,000 ODP-tonnes of CFCs over the period 2003-2005 and through 2007, and even some ODPs in the years beyond, in countries other than China. Approximately 12,000 ODP-tonnes of CFCs will be phased out in China with the funding agreed for the triennium 2003-2005.

Approximately 6,200 ODP-tonnes of CTC and 160 ODP-tonnes of TCA will be phased out following approvals in the 2003-2005 triennium. The period 2005-2007 is mentioned because projects that will be approved in and particularly after the year 2003 will not have been implemented before the year 2005, due to the implementation lag.

The estimated total funding requirement for investment projects in the consumption sector to reduce the consumption of CFCs, CTC, TCA and methyl bromide during the period 2003-2005, in order to comply with the Protocol, is roughly **US\$367.6 million**. The largest amount of the funding required is for CFC projects (US\$240 million or 66% of the total).

The agency support costs to be added to the total amount of US\$368.167 million amount to US\$37.902 million (US\$24.717 million for CFCs, US\$0.675 million for chillers, US\$5.374 million for TCA and CTC, US\$7.136 million for MB).

To the estimates given above an uncertainty has to be applied of US\$24.063 million (including agency support costs US\$26.710 million).

5 The Funding Requirement for the 2003-2005 Replenishment; the Production Sector

5.1 Introduction to the Production Sector

Next to the consumption sector, this Replenishment Study considers the funding requirement for all ODS production sectors, i.e., compensation funds for the closure of facilities. Agreements for the halon sector in one producer country and for the CFC sector in three producing countries were already decided before the triennium 2003-2005. Production in other Article 5(1) countries may also be addressed in the triennium 2003-2005.

5.2 Investment Projects in the Halon Production Sector

As presented in Annex 4, the Executive Committee Decision 23/11, which refers to the halon sector phase-out strategy in China, determines the funding requirement for the strategy on an annual basis. It is dependent on final approval by the Executive Committee during the three-year periods through 2009. For the period 2003-2005, **US\$14.4 million** is required (see the table in Annex 4). The agency fee in this case amounts to 10%.

5.3 Investment Projects in the CFC Production Sector

Decision 19/36 of the Executive Committee states that, pending the completion of production sector plans, the focus should be on closure projects. Decision 19/36 also requires, in general, that the scrap value of decommissioned ODS plants should be used to offset the cost of dismantling the plant.

The Government of China has agreed (March 1999) to a sector plan for the phase-out of CFC production at a total cost of US\$150 million with phased payments of US\$20 million in 1999 followed by 10 annual payments of US\$13 million in current prices. On this basis, the funding required for the 2003-2005 replenishment is US\$39 million. The Government of India has agreed (1999) to a phase-out plan for the CFC production sector at a total cost of US\$82 million, with payments at a level of US\$34 million during 1999-2001, followed by 8 annual payments of US\$6 million. On this basis, the funding requirement for the 2003-2005 replenishment is US\$18 million.

The Government of the Democratic Republic of Korea has agreed to a certain amount of funding in relation to the closure of the entire production capacity. It implies that US\$733,700 has to be reserved as a funding requirement for the Democratic Republic of Korea; it will be disbursed in the year 2003 upon satisfactory verification of permanent closure (with no obligations in the years thereafter).

Table 4-9 2003-2005 Replenishment: Funding Requirement for the Period 2003-2005 for CFC Production Phase-outs in Article 5(1) Countries (status March 2002), in US\$ million

Article 5(1) Country	1997 and 2000 Production Data (Annex A Gr I) (ODP- tonnes) (Ozone Secretariat)		Funding requirement per year (US\$ million)	Total Funds 2003-05
China	50,324	39,994	13 / 13 / 13	39
India	23,658	20,404	6 / 6 / 6	18
Korea, Dem. Rep.	203	(1999) 106	0.734 (year 2003)	0.734
Brazil	9,362	0		
Argentina	2,804	3,027		(total estimated) 9
Mexico	8,431	7,546		
Venezuela	5,663	2,281		
Total (estimated)				

Negotiations can be expected between the Executive Committee of the Multilateral Fund and other Governments with a view to agreeing the funding required to phase out CFC production in countries such as Argentina, Mexico and Venezuela (in the cases of Mexico and Venezuela it concerns roughly 50% foreign ownership).

On the basis of the production figures for China and India in the years 1997 and 2000, the Task Force has compared production figures for Argentina, Mexico and Venezuela for the same years. If closure plans will be agreed upon in the near future, it is the Task Force's best estimate that it would concern US\$9.0 million for the respective countries for the triennium 2003-2005. These figures are in so far subject to uncertainty that the funding profile that would be decided for the entire period 2003-2009 could be different than assumed here. Table 4-9 summarises the agreed payments for the years 2003-2005 as well as the estimates for three countries.

The provisional total funding requirement for the CFC production sector for the 2003-2005 triennium is **US\$66.734 million**. An agency support fee of 7%, 8% and 5% is applicable to the closure projects for China, India, and the Democratic Republic of Korea, respectively, and a support fee of 8% is assumed to be agreed in future for the closure projects in three South-American countries, as given in the table above (the total of agency support costs amounts to US\$4.927 million).

Once further information becomes available, the TEAP Task Force will review the funding requirement determined above and possibly revise it accordingly.

5.4 Investment Projects in the CTC Production Sector

In the near future it can be expected that negotiations will start on the closure of those facilities that produce CTC as process agents and as cleaning agents. It is difficult to mention at this stage what would be the amounts applicable to such closure projects. It would concern a (global) production of 9,800 ODP-tonnes (compare the data given above for cleaning agents and for process agents approved under decision X/14). Consultations with experts in the field have resulted in the conclusion that, due to different price scenarios and due to differences in the compensation concept (CTC is also used as feedstock in large quantities), and due to pressure on the cost price, a value of 20-25% compared to closure projects for CFCs would apply.

The Task Force estimates that such closure projects would cost US\$6 million in total, of which possibly **US\$2.6 million** would be required during the triennium 2003-2005 (for which an agency support cost of 8% would be applicable). This would include the amount of US\$488,750 for the closure of the CTC production capacity in the Democratic Republic of Korea, to be disbursed in 2005 upon satisfactory verification of permanent closure of the capacity (an agency support cost of 5% applies here) (the total amount of agency support costs would be US\$0.193 million here).

5.5 Investment Projects in the MB Production Sector

Article 5, 8 *ter.*(d) of the Protocol specifies that the MB production in Article 5 countries must be frozen in 2002 (at the baseline level of 1995-98) and reduced by 20% in 2005. Three Article 5 countries produce MB at present, but only one produces substantial quantities (more than 60 ODP-tonnes per annum for non-QPS purposes). Two of the producing countries have not yet ratified the Copenhagen Amendment, but the largest of these has stated its intention to ratify by the end of 2002.

Total production was about 1,095 ODP-tonnes (excluding QPS and feedstock) in 2000. Production needs to be reduced by about 306 ODP-tonnes to meet the freeze and by about 155 ODP-tonnes to meet the 20% reduction in 2005, giving a total of about 461 ODP-tonnes in production that needs to be eliminated in the next triennium.

There is no experience to date of projects to fund (or compensate) the reduction of MB production in Article 5(1) countries, and the TEAP Replenishment Task Force is not able to provide a reliable estimate of financial implications at this stage.

6 The Funding Requirement for the 2003-2005 Replenishment; Supporting Activities – Non-investment Projects

This chapter presents the funding requirements for all projects other than investment projects in the ODS consumption and production sectors, i.e., non-investment projects. For the purposes of this report, these projects are classified as follows:

- (1) clearing-house and information-exchange activities;
- (2) awareness-raising programmes;
- (3) preparation of country programmes and updates;
- (4) institutional strengthening projects;
- (5) refrigerant management plans (RMPs), and updates (these plans have virtually always training components);
- (6) halon banking analysis;
- (7) methyl bromide related activities;
- (8) MDI transition strategies; and
- (9) other technical assistance projects.

Actual reductions in ODS consumption through the use of non-investment activities have been documented. E.g. this is reported in the Multilateral Fund's *Inventory of Approved Projects (as at December 2001) /IAP02/*. This contribution to ODS reduction is likely to rise as an increasing number of non-investment projects are completed. In Decision 35/57 (see Annex 1) the Executive Committee has decided that non-investment activities can be considered to phase out ODS at a cost effectiveness of US\$12.1/ODP-kg. This implies that the funds approved for non-investment activities can be converted to ODP-tonnes phased out so that the number of ODP-tonnes calculated to be funded via investment projects can be reduced. This will then have a direct consequence for the amount of funding in total.

LVCs, according to Decision 31/48 of the Executive Committee, will not receive separate, project-dependent funding for a refrigeration consumption sector phase-out. In the refrigeration sector, they can only submit funding requests for Refrigerant Management Plans. They can require additional funding for activities in the refrigeration sector, but this funding should not exceed 50% of the funds approved for the original RMP. This may change in the year 2007 when they are supposed to address the last 15% of their CFC consumption. It implies that funding for refrigeration investment projects cannot be considered in the triennium 2003-2005 (the LVC countries, of course, can submit investment projects for other application sectors than refrigeration, but these are normally less important in these countries).

The above implies that the reduction via the US\$12.1 /ODP-kg “rule” cannot apply to the LVC countries, which has been confirmed in Decision 36/7. In this report the funding for non-investment activities has therefore been split into two parts, one for non-LVC countries (countries in Categories 1, 2 and 3)

and one for LVC countries (countries in Categories 4 and 5). Only the funding for non-investment activities in non-LVC countries will be considered following the conversion to ODP-tonnes, as mentioned above (Decision 35/57, see Annex 1, and for LVCs, Decision 36/7).

6.1 The CAP programme; Personnel Costs, Clearing-house and Information Exchange Activities (UNEP)

As an Implementing Agency of the Multilateral Fund, UNEP implements clearing-house and information exchange activities such as global information exchange, and the regional networking of National Ozone Officers. At the 35th meeting of the Executive Committee a new approach for a large portion of UNEP's activities was discussed. UNEP proposed to bring its information dissemination, personnel, subcontract, training, equipment and premises components together in a "Compliance Assistance Programme", the so-called CAP programme. In principle all personnel in Paris and the regions, i.e. the Regional Network Co-ordinators and their assistance all fall under the CAP programme. UNEP promoted this program by mentioning that country assistance can be given much faster in the period of compliance with the Montreal Protocol reduction steps. UNEP's approach has been approved for the year 2002 and beyond.

For the year 2003 costs are budgeted at US\$5,565,508, for 2004 at US\$5,788,128 and for 2005 at US\$6,019,653 which amounts to a total of US\$17,373,289. It is difficult to say which part of the CAP program is applicable to LVCs and which part to non-LVCs. One could apply a linear relationship with the CFC consumption in the two country groups, but this would imply that virtually all assistance would be non-LVC countries. A better division would be obtained by looking at the number of countries. The percentage of non-LVC countries in the total number of countries, which are considered to receive Multilateral Fund support, amounts to 30%. This then yields that, of the total of **US\$17.37 million** for the CAP program, **US\$5.21 million** of the funds is for non-LVCs and **US\$12.16 million** is for LVC countries. Agency support costs for the CAP program are at a level of 8%.

6.2 Awareness Raising Programmes

UNEP is made available US\$200,000 per year for awareness raising programmes. This amounts to a total of **US\$0.60 million** for the triennium 2003-2005. Of this amount **US\$0.18 million** can be assumed to be for non-LVC countries, and **US\$0.42 million** for LVC countries. To these programs an agency support cost of 13% applies.

6.3 Preparation of Country Programmes (or CP updates)

There will be a number of countries for which country programmes or country programme updates will be done. However, the relevant decision also says that RMPs and RMP updates should be done for LVCs, and that this would take away the need for CP updates. Furthermore, there are certain countries (in groups 2 and 3, possibly also 4 and 5) for which terminal phase-out plans will be submitted, which implies that they would not need any CP or RMP updates (this type of plans has already been decided for e.g. Malaysia, Thailand, Turkey and the Bahamas).

There remain a number of countries for which CP efforts will be needed, however, it is difficult to determine which ones and also how much the CP updates would cost. If one e.g. would assume that CP updates would be needed for 12-15 countries and that new country programmes will be needed for 5-8 countries, it would involve an amount between US\$ 1 and 1.5 million. It seems reasonable to assume **US\$ 1.20 million** for the triennium, of which an estimated **US\$0.60 million** would be for non-LVCs. The agency support costs for these activities amount to 13%.

6.4 Institutional Strengthening (IS)

Consultations with the Multilateral Fund Secretariat resulted in a list with amounts for Institutional Strengthening for all countries. The amounts per country are disbursed every two years, i.e. the amount for IS for 2002 is equal to the amount for 2004, and the amount for 2003 is equal to the amount for 2005.

The amount for the year 2002 equals US\$8,938,436 according to the Business Plans for 2002 of the Implementing Agencies. From the information of the Multilateral Fund Secretariat one can derive that Institutional Strengthening projects will cost US\$4,164,150 in the year 2003. In this way the amounts for the years 2004 and 2005 are also known (two times the amount for 2003, one time the amount for 2002).

The total amount for Institutional Strengthening projects during the triennium 2003-2005 will therefore be **US\$18.17 million**. Careful analysis of funding proposals for all Parties shows that, of this amount, **US\$10.53 million** will be for non-LVC countries, whilst **US\$7.14 million** will be for LVC countries. Agency support cost for these projects is 13% of the project value.

6.5 Refrigerant Management Plan Preparation and Updates

The preparation of new RMPs is difficult to estimate. If one looks at the 2002 business plans and at the planned RMP updates, one comes to a total of US\$ 280,000. Assuming that the average amount per year in the triennium will

decrease, the amount would be three times US\$240,000, for which the total can then be calculated as **US\$0.72 million**. In this case **US\$0.24 million** would be for non-LVC countries, whilst **US\$0.48 million** would be for LVC countries. An agency fee of 13% applies to this activity.

6.6 Refrigerant Management Plans (RMPs)

The agencies (mainly UNEP) deliver national training projects in the low-volume consuming countries (LVCs) where, in most cases, the only significant ODS use is in the refrigeration and air conditioning sector. Therefore, nearly all of these national training projects are concerned with the implementation of Refrigerant Management Plans (RMPs). Related training for customs officials and refrigerant technicians is also carried out in the context of the RMPs. In recent years many RMPs have been funded. If one looks at the aggregate sum approved through 2001 it is somewhat less than US\$20 million (US\$19.03 million if all bilaterals are included). The Executive Committee has decided that of the original approved funds for RMPs Parties are entitled to receive a 50% supplement (for incentive programs, implementation etc.). It is possible to study the list with all Parties that have received supplements through the year 2001, and which Parties will receive supplements in the year 2002. One can also derive from the list how many non-LVC Parties have not been funded an RMP, and how many LVC Parties are still without a RMP.

Both in the non-LVC group as well as in the LVC group, 50% supplements at US\$1.50 million are outstanding. For 10 non-LVC countries an RMP can be assumed to be approved in the triennium 2003-2005 at a level of US\$270,000 (the average level of the RMPs funded or that will be funded in 2002 for this group of countries). For 15 LVC countries an RMP can be assumed to be approved 2003-2005 at a level of US\$180,000 (the average level of RMPs approved in recent years, or to be approved in 2002). The above implies total funds required for non-LVC countries at a level of **US\$4.20 million**; exactly the same amount applies to LVC countries. The total amount is therefore **US\$8.40 million**. To this type of projects the agency support cost of 13% applies.

6.7 Halon Banking Analysis

The Multilateral Fund Secretariat inventory list containing halon banking projects has been discussed with the Secretariat /MFS02/. It explicitly mentions three countries that will receive support for establishing halon banking activities in the year 2002 (not including China for which a halon banking and halon consumption phase-out schedule has been agreed upon). This leads to the conclusion that very few countries will get support for a halon banking plan in the year 2002 (the funds available in 2002 will probably also not allow too much to be spent here).

One can further investigate the total number of Article 5(1) countries listed in the inventory by the MLF secretariat; the total number equals 124. This number can then also be seen as the total number of countries that need to be addressed.

For determining the total funds needed for halon banking activities in the triennium 2003-2005, one has to take into account all those countries that have not (yet) received funds, and apply the amounts US\$ 500,000, US\$ 250,000 and US\$ 30,000 for high, medium and low consuming countries. The difference between high and medium is at a consumption of about 25-50 ODP-tonnes. Of course, one can depart from the latest reported consumption, but one should also take into account the baseline consumption and the halon inventory. In fact, the baseline consumption (and halon inventory) determines with which type of country one has to deal with.

Of the 42 countries that are assumed to be in compliance 3 medium volume (US\$750,000) and 17 low volume halon consuming countries US\$510,000) have not yet received assistance for halon banking activities. Of the 17 countries that could be in compliance one medium volume (US\$ 250,000) and 6 low volume halon consuming countries have not received assistance (US\$ 180,000). Of the 52 countries with no halon consumption, 47 have not received assistance; they should be assumed to receive assistance (US\$ 1,410,000) in the triennium 2003-2005. For the 13 countries that have no data reported the best-case-scenario is to assume also support here (US\$ 390,000). The total of the funds needed for assistance, as given above, amounts to **US\$ 4.71 million** (if a sub-division is preferred: **US\$2.63 million** will be for non-LVC countries, **US\$2.08 million** will be for LVC countries). However, the Task Force has not taken the subdivision into further account because the rule that non-investment activities can be converted to ODP-tonnes to be phased out does not apply for the separate halon sector. An agency support cost of 13% applies to this type of projects.

6.8 Methyl Bromide: Non-Investment Projects

In the year 2001 there has been a strong trend to not further consider any non-investment activities for methyl bromide, but only activities that lead to a certain phase-out of ODP-tonnes. The Task Force, however, cannot exclude that certain non-investment activities will be needed in the triennium 2003-2005 (workshops, training etc.). In the IA business plans for 2002 one can also find a small amount for non-investment MB activities at a level of US\$310,000. Therefore for the triennium an amount of **US\$0.90 million** is assumed to be needed, mainly in LVC countries. An agency support cost of 13% would apply to these activities.

6.9 MDI Transition Strategies

There are concerns about the cost and /or availability of healthcare in Article 5(1) and CEIT countries. Notably, inhaled therapies are usually more expensive than commonly available oral medications that are less effective and maybe more hazardous. Funding should be limited to the incremental costs of CFC MDI transition.

Branded HFC based MDIs from multinationals are of comparable price to the CFC MDIs they replace, but are more expensive than locally manufactured CFC MDIs. For the purposes of considering funding, Article 5(1) countries can be divided into two categories, those with local manufacture of CFC MDIs, and those without:

1. Article 5(1) countries with local manufacture require active transition policies. These plans need to be individualised for each Party, based on the widely differing local circumstances and may require financial support for the development of alternative formulations, modification of manufacturing plants, and fulfilling regulatory obligations for marketing. These aspects will require input by appropriate pharmaceutical and technical experts in order to ensure optimal use of any development funding. The Task Force at this stage can only make a preliminary analysis what the implication would be for the Article 5(1) countries that are producing countries. On the basis of information from the ATOC /ATOC98/, from discussions on current practices, the funding estimate determined for the triennium 2003-2005 is equal to US\$2.5 million.
2. The large majority of Article 5(1) countries have no local manufacture and rely entirely on the import of CFC MDIs. Transition in those countries may be less interventional according to a common template strategy and based on local availability of CFC-free alternatives.

Experience in developed countries has been that education has largely been provided by MDI manufacturers, supplemented by information from health authorities and patient support groups. Support for educational efforts in developing countries may be needed to facilitate transition, dependent on local circumstances. The development of transition policies could be facilitated by a series of regional workshops (costs involved would be six times US\$80,000 for six workshops, i.e., US\$480,000).

The total funding requirement for MDI transition processes would therefore be **US\$2.980 million** (an agency support fee of 13% would apply).

6.10 Other Activities of the Implementing Agencies

Next to its CAP program, UNEP has submitted a request for funding for the year 2002 at a level of US\$5.32 million for activities in IS, RMPs, training

and technical assistance. These activities have already for the larger part been considered in the separate subchapters above, for all Implementing Agencies. Some specific activities will not be carried out by agencies other than UNEP, according to the business plan, i.e. there is a US\$1.11 million funding requirement for activities to be carried out specifically by UNEP.

The World Bank, UNIDO and UNDP, as the other Implementing Agencies of the Multilateral Fund, have submitted their, respective, estimates for non-investment project spending during the year 2002, where it specifically concerns technical assistance (and some training) projects, at a level of US\$4.37 million. The total amount requested for other activities for the year 2002 is therefore US\$5.48 million. It is difficult to predict whether this trend will increase or decrease during the triennium 2003-2005. The Task Force therefore assumes that, for these activities, funding at a level of **US\$16.50 million** will be needed. On the basis of what has been submitted it is estimated that, of the total amount, **US\$6.80 million** will be needed for non-LVC countries, and **US\$9.70 million** will be needed for LVC countries. The support costs of the agencies for these activities are at a level of 13%.

6.11 Other Costs Related to Non-investment Activities

6.11.1 Administrative Costs of the Implementing Agencies

In this 2003-2005 replenishment report, the administrative costs of the Implementing Agencies are determined in the investment part and the non-investment part of the report.

For the non-investment activities proposed in the report the administrative costs of the agencies can be calculated as **US\$8.592 million** (this can be compared to agency support costs at a level of US\$60 million for all investment projects).

6.11.2 Operating Costs of the Executive Committee and the Multilateral Fund Secretariat

The funding required for the operating costs of the Secretariat and Executive Committee of the Multilateral Fund was determined through consultations with the Multilateral Fund Secretariat regarding past operating budgets and the anticipated future workload. In principle, no major change is expected to the level of the operating budget except inflation. The revised costs for the year 2002 for the Multilateral Fund Secretariat and the activities of the Executive Committee (including funds for monitoring and evaluation of the implementation of Multilateral Fund approved projects) amount to US\$3,104,067. In total, while assuming a 3.13% increase (inflation) per year, a funding requirement for the operating costs of the Executive Committee and

the Multilateral Fund Secretariat for the 2003-2005 replenishment period is estimated to be **US\$9.91 million**.

6.11.3 Project Preparation Costs

The Implementing Agencies budget their project preparation costs as part of the investment project funding; these costs should not be considered as non-investment activities. The percentage that applies is in the order of 3% of the project value, but this can vary between roughly 2 and 4% dependent on the size and the type of the project. It is difficult to estimate the number of projects, their precise sizes and types for the triennium 2003-2005. Looking at historic data, particularly for the years 1999-2002, the average project preparation cost has been US\$3.088 million annually. Assuming that the number of projects will decrease but that the complexity will increase, there seems to be no reason to assume significantly different figures for the triennium 2003-2005. Project preparation costs are therefore calculated as **US\$9.264 million** for the 2003-2005 replenishment period.

6.12 Non-investment Funding for Non-LVC countries

In the different sections in chapter 6 the amounts applicable to non-LVCs have been given. It is the Task Force's conviction that this does not apply to amounts related to halon banking schemes, MDI transition strategies etc. According to Decision 35/57, the amounts that apply can be added, calculated as an amount of ODP-tonnes via the US\$12.1/kg rule, and can be subtracted from the amount in ODP-tonnes that the non-LVC countries have to phase out in order to comply with the Montreal Protocol, which will lead to a reduction of the funds required there.

The total (not including halon banking, MDI transition etc.) amounts to **US\$27.76 million**, which would equal 2294 ODP-tonnes, if the amount is divided by US\$12.1/ODP-kg. This amount in ODP-tonnes should be subtracted in the overall balance. In a balance that mentions the funding requirement for the different activities, this amount of 2,294 ODP-tonnes can again be converted to a (negative) funding by applying the average cost-effectiveness factor calculated for all non-LVC investment projects. It is possible to derive the average cost effectiveness for CFCs from the investment calculations. This yields US\$8.05/ODP kg, for the investment of US\$186.537 million (see Table 4-8, first row, total amount for CFCs minus the amount for China). The 2294 ODP-tonnes can therefore again be calculated back to an amount of funding to be subtracted from the total funding requirement determined. With the above mentioned cost effectiveness value, the amount to be subtracted equals US\$18.467 million (excluding agency support costs at about 10.6%, i.e. US\$1.957 million; the total therefore is US\$20.424 million).

7 Total Funding Requirement

The estimates for the individual expenditure categories of the Multilateral Fund are combined into the total estimated funding requirement for the 2003-2005 replenishment. These estimates are based on the assumptions of a zero time discount rate and a zero inflation rate; therefore all monetary estimates can be regarded as being presented in US dollars at 2002 prices. However, this does not relate to the funding requirement determined for the CAP programme and for the operational costs of the Multilateral Fund and the Executive Committee, since the agreements depart from an inflation correction. The total funding requirement for the 2003-2005 Replenishment is presented in the table below.

It is calculated by adding up all elements given above, and subtracting from it the non-investment activities for non-LVCs, at a value of 2294 ODP-tonnes. This can be calculated as US\$18.467 million, using the average cost effectiveness calculated from all CFC investment projects (it would also avoid agency support costs for these ODP projects –which will not have to be implemented as investment projects-- at a value of US\$1.957 million).

Table 7-1 Summary of all elements that determine the 2003-2005 funding requirement

Type of projects	Investment (US\$ million)	Agency support cost (US\$ million)	Subtotal (US\$ million)
a. Investment projects consumption sector			
• Contr. to CFC phase-out (as of 2005), incl. China	239.563	24.717	
• 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	
Subtotal	367.572	37.902	405.474
b. Investment projects Production sector			
• Closure CFC production plants	66.734	4.927	
• Closure Halon production plants (China)	14.400	1.440	
• Closure CTC production plants	2.600	0.193	
Subtotal	83.734	6.560	90.294

Type of projects	Investment (US\$ million)	Agency support cost (US\$ million)	Subtotal (US\$ million)
c. Non-investment projects, supporting activities			
• CAP programme (Personnel, Clearinghouse and Information Exchange)	17.370	1.390	
• Awareness raising	0.600	0.078	
• Preparation CP (updates)	1.200	0.156	
• Inst. Strengthening (IS)	18.170	2.362	
• RMP preparation (updates)	0.720	0.094	
• RMPs	8.400	1.092	
• Halon banking	4.710	0.612	
• MB non-investment act.	0.900	0.117	
• MDI transition strategies	2.980	0.387	
• Other activities IAs	16.500	2.145	
Subtotal	71.550	8.433	79.983
d. Other funding requirements			
□ Multilateral Fund Executive Committee and Services of the Multilateral Fund Secretariat	9.910		9.910
e. Other funding requirements			
Project Preparation costs	9.264		9.264
SUBTOTAL	542.030	52.895	594.925
Value of non-investment activities, Which needs to be subtracted	18.467	1.957	-20.424
Total Funding Requirement, Multilateral Fund 2003-2005 Replenishment			574.501

To this amount an uncertainty needs to be attached of US\$26.710 million; this is due to the fact that the Replenishment Task Force has not been able to derive a one point estimate for the investments needed in the CFC consumption sector; this is due to the large variation in cost effectiveness values applied to date in different types of projects. It actually implies that there is a range of US\$548-600 million for the funding requirement for the period 2003-2005.

8 Conclusions

8.1 Introduction

The TEAP Replenishment Task Force prepared this report on the funding requirement for the 2003-2005 replenishment in accordance with Decision XIII/1 of the Thirteenth Meeting of the Parties. The total funding requirement was determined by the sum of the estimates for the following six cost categories: (1) investment project approvals in the consumption sector; (2) investment project approvals in the production sector; (3) supporting activities, i.e., non-investment projects for the phase-out process; (4) the administrative costs of the Implementing Agencies; (5) project preparation costs; and (6) the operating costs of the Secretariat and Executive Committee of the Multilateral Fund. The analytical methods used to estimate the respective cost components were largely the same as those used in the 1999 Replenishment Study /RTF99/. However, this replenishment study for the period 2003-2005 had to investigate a number of approaches for the determination of the funding requirement of CFC investment projects. Next to an analysis, it had to take into account a number of cost components for activities in countries that were already agreed upon by the Executive Committee.

8.2 Present Trends

As of December 2001, the Executive Committee of the Multilateral Fund had approved US\$1.277 billion for a large number of projects. These projects will eventually eliminate 116,000 ODP-tonnes of CFCs and lower ODP tonnages of methyl bromide, CTC and TCA. Production closure projects have been decided for CFCs in China and India for the production levels of 44,931 and 22,588 ODP-tonnes, respectively. A closure project has also been decided for the Democratic Republic of Korea. The halon production sector phase-out plan in China will phase out roughly 25,000 ODP-tonnes over the period 1999-2010.

For Article 5(1) countries, total consumption of all controlled substances peaked in 1995 at about 230,000 ODP-tonnes after which it began to decline. Reported consumption in 1996 was approximately 30,000 ODP-tonnes lower than in 1995. In 1997, the estimated total consumption slightly increased. Thereafter the consumption decreased, virtually only through the implementation of projects. Between 1999 and 2000 the decrease in the CFC consumption slowed down, and several countries showed large growth percentages again, in spite of the continuous implementation of projects.

In the present study for the 2003-2005 replenishment, investment projects for all substances have become important. As for the earlier Replenishment Study /RTF99/, funding for production closure also remains important.

However, the strategy of the Multilateral Fund has changed from a project focus to country specific and country driven approaches. This implies that a mathematical analysis can be done which will yield consumption patterns into the future and will yield the required investments; however, the calculation of the funding required has become a mixture of analytical approaches based upon the mathematical analysis and many country specific sectoral approaches. This has implications for the future. Not only for the cost effectiveness of future projects, but also for the monitoring of country specific projects such as National Phase-out Plans.

The mathematical analysis for the CFC consumption using the historic approach has been used to calculate the funding requirement for the separate countries that have a baseline larger than 1,000 ODP-tonnes. Results of these calculations have been compared to funding agreed in National Phase-out Plans. Assumptions were made on the amounts to be addressed in the period 2003-2005. This resulted in a downward adjustment of the funding calculated, following certain considerations on the order of magnitude per country category by the Task Force. It resulted in a decrease of the value for CFC investment activities from about US\$307 to about US\$186 million. These amounts exclude the amounts agreed for China in sectoral phase-out plans.

8.3 Non-investment Activities

Compared to earlier replenishment periods, the non-investment activity component has become much more predominant. These activities are put more in the forefront, not only for LVC countries, but also for non-LVC countries. One realises that, where it currently concerns more country specific approaches, it is the institutional strengthening component and the networking of countries with other countries in the region that has become a determining issue. It should also be emphasised that Refrigerant Management Plans for the LVC countries are the important means to phase out consumption in the refrigeration (servicing) sector. It should be emphasised here that the Task Force determines about US\$80 million as the funding requirement for non-investment activities for all countries.

With the growing importance of these activities, the Executive Committee decided (Decision 35/57 and Decision 36/7) that these activities would lead in the non-LVC countries to a certain phase-out expressed in ODP-tonnes. And it was therefore decided that this amount should be subtracted from the amount involved in projects, which would otherwise need funding. The Task Force has carefully analysed these activities and has calculated which amount needs to be subtracted from the total funding requirement determined for the replenishment period 2003-2005.

8.4 The Funding Requirement for the 2003-2005 Replenishment

The 2003-2005 Replenishment represents the Task Force's best estimate of the funding requirement for the 2003-2005 replenishment of the Multilateral Fund. It provides for the funding required to enable the Article 5(1) Parties to comply with control measures for all Annex A, B and E substances, after that there has been a freeze in 1999/2000 (CFCs), 2002 (methyl bromide) or 2003 (TCA). It is based on the best estimates of model parameters, and particularly also of calculations which have involved the funding requirements agreed for all kind of sectoral or national phase-out plans. It is also based on consultations with the Multilateral Fund Secretariat, the Implementing Agencies, the members of the 2001 Executive Committee, the members of the Ad-hoc Working Group, and many national experts via a questionnaire approach.

The funding requirement for the 2003-2005 replenishment to enable the Article 5(1) Parties to comply with the control schedules under the Montreal Protocol is estimated at **US\$574.5 million ± US\$26.7 million** (i.e., the range US\$548-600 million). A sub-division is given in the table below.

Replenishment Cost Components:	US\$ Million
CFC Consumption Sector Projects	239.6
Chillers, investments for starting revolving funds	5.0
CTC/ TCA Consumption Sector Projects	58.1
MB Consumption Sector Projects	64.9
Investments: Production Sector	83.7
Non-investment activities; supporting Activities	71.5
Administrative costs of Implementing Agencies	52.9
Project preparation cost	9.3
MLF Secretariat/ Executive Committee Operational Costs	9.9
Non-investment activity value to be subtracted	-20.4
Total	574.5

This US\$ 26.7 million uncertainty is based upon the fact that the Task Force has not been able to derive a one-point estimate for the funding requirement in the CFC consumption sector.

Replenishment studies are highly dependent on the databases maintained by the Multilateral Fund Secretariat and the Ozone Secretariat. The importance of high quality and readily accessible data cannot be overly stressed. For this study, the Task Force has had access to the latest versions of the databases. The TEAP is grateful for the assistance provided by both Secretariats and their insights into the strengths and weaknesses of the data.

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Annex 1: Relevant Decisions of the Executive Committee

Below extracts of the reports of the Executive Committee are given (31st and 35th Meetings), which contain the Decisions 31/48, 35/56 and 35/57.

Decision 31/48

A. Already approved refrigerant management plans (RMPs) for low-volume-consuming countries (LVCs)

To request national ozone officers, with the assistance of the implementing agency concerned, to review and assess the content, implementation to date and expected outcomes of their RMPs against their objective to phase out all consumption in the refrigeration sector according to the Montreal Protocol timetable. In undertaking this review, national ozone officers should:

- Calculate current and forecast future consumption in relation to the freeze, 50% cut in 2005, 85% cut in 2007 and phase-out in 2010 and calculate the size of consumption cuts in the refrigeration sector required to meet these targets;
- Include forecast cuts in consumption attributable to the activities already approved under the RMP, including training activities and recovery/recycling;
- Ensure that the current and expected future consumption of all subsectors, including the informal sector, small and medium-sized enterprises and mobile air conditioners, are included in the review;
- For each activity identified, consider the cost and means of funding, including national financing;
- Ensure that the RMP and government strategy for delivering phase-out includes adequate provision for monitoring and reporting on progress;

That LVCs (or groups of LVCs) with already approved RMPs may submit to the Executive Committee requests for funding additional activities necessary to reduce consumption and thereby ensure compliance with the Protocol. Such additional activities should be essential parts of their comprehensive strategy for phase-out in the refrigeration sector. Additional funding shall not exceed 50% of the funds approved for the original RMP or, where relevant, RMP components. With the possible exception of the post-2007 period noted in subparagraph (d) below, no further funding beyond this level, including funding related to retrofits, would be considered for activities in this sector;

That requests for additional funding consistent with subparagraph (b) above should be accompanied by:

- A justification for the additional activities to be funded in the context of the country's national phase-out strategy;

- A clear explanation of how this funding, together with the initial RMP funding and steps to be taken by the government, will ensure compliance with the Protocol's reduction steps and phase-out;
- A commitment to achieve, without further requests for funding for the RMP, at least the 50% reduction step in 2005 and the 85% reduction step in 2007. This shall include a commitment by the country to restrict imports if necessary to achieve compliance with the reduction steps and to support RMP activities;
- A commitment to annual reporting of progress in implementing the RMP and meeting the reduction steps;
- That it will review in 2005 whether further assistance is needed for the post-2007 period, and what assistance the Fund might consider at that time to enable full compliance with the Protocol's phase-out requirements;

B. Preparation and approval of new RMPs for LVCs

That the project preparation phase for RMPs should, as intended by the existing guidelines, include a full survey of CFC consumption in all subsectors, the development of a comprehensive government phase-out strategy and a commitment by the government to enact regulations and legislation required for the effective implementation of activities to phase out the use of CFC refrigerants. To enable these preparatory activities, including the development of legislation and regulations, to be completed in full, the funding provided for the project preparation phase should be double the level traditionally provided;

That the provisions relating to existing RMPs in section A, subparagraphs (a), (c) and (d) above shall also apply to new RMPs submitted pursuant to this decision;

That in lieu of the ability given to already approved RMPs to request additional funds, the total level of funding for the implementation of new RMPs could be increased by up to 50% compared to the level of RMP funding typically approved to date, with flexibility for the country in selecting and implementing the RMP components which it deems most relevant in order to meet its phase-out commitments. With the exception of the post-2007 phase noted in section A, subparagraph (d) above, no further funding beyond this level, including funding for retrofits, would be considered for activities in this sector;

That the following text should be added to the RMP guidelines (decision 23/15) after the last bullet in section 3.1:

“The elements and activities proposed for an RMP, whether they are to be funded by the Multilateral Fund or the country itself, should reflect the country's particular circumstances and address all relevant sectors including the informal sector. They should be sufficient to ensure fulfilment of the

countries' control obligations at least up to and including the 85% reduction in 2007, and should include mechanisms for reporting progress.”

C. RMPs for higher-volume-consuming countries

That, taking into account the need for large consuming countries to initiate planning for dealing with this large and complex sector, as well as the related decision of the Meeting of the Parties, it will consider requests for funding the development of long-term strategies for the refrigeration sector for high-volume-consuming countries. High-volume-consuming countries that have not yet undertaken country programme updates should undertake this strategic RMP development in the context of such updates, consistent with any Executive Committee guidance on country programme updates;

That future Executive Committee decisions on funding the implementation of the elements of such RMP strategies should take into account the relative priority in national government planning of CFC reductions in the refrigeration sector and the availability of other reduction opportunities in meeting the country's control obligations;

That, in that context, the Executive Committee may consider whether certain activities often considered to be part of an RMP (such as training of customs officers) could be initiated before an RMP was developed.

Strategic Planning of the Multilateral Fund:

(a) Revised document 34/53: follow-up to Decision 34/66 (c)

Introducing the item, a representative of the Secretariat drew attention to document UNEP/OzL.Pro/ExCom/35/60, “Strategic planning of the Multilateral Fund; revised document 34/53: follow-up to Decision 34/66 (c)”, which had been prepared in line with Executive Committee Decision 34/66 (c). He explained that the written comments received from Executive Committee members had been taken into account in a revised version of document UNEP/OzL.Pro/ExCom/34/53 and in a revised set of recommendations. The document contained sections of text in square brackets, which designated issues that were still under consideration by the Committee and had not yet been resolved.

One representative considered that the revised version of document UNEP/OzL.Pro/ExCom/34/53 should also make mention of the role of the implementing agencies and of the need to ensure the involvement of all stakeholders.

Following a discussion, the Executive Committee decided:

Decision 35/56

To adopt the adjusted funding policies of the Multilateral Fund, based on the revised proposals prepared by the Secretariat in the revision to document UNEP/OzL.Pro/ExCom/34/53, as amended at the 35th Meeting of the Executive Committee and as contained in Annex XVI to the present report, and to emphasise (i) greater government responsibility for managing national phase-out programmes, (ii) the demonstrated relevance of projects defined as a direct, and, if applicable, quantifiable linkage between the funded activities and meeting the specific Montreal Protocol control measures;

To request the Secretariat to work with members of the Executive Committee, the bilateral agencies and the implementing agencies to develop draft guidelines for the preparation, implementation and management of performance-based substance-wide and national phase-out agreements;

To request the Secretariat, together with members of the Executive Committee and the implementing agencies, to review the guidelines for the funding of institutional strengthening projects in view of the adjusted Fund Policy of emphasising greater responsibility of governments for national phase-out programmes, with the objective of linking funding of institutional strengthening projects more closely with compliance needs of countries. The review should take into consideration the results of the recently completed evaluation of the institutional strengthening projects and Decision 30/7, funding criteria, implementation modality, and the willingness of the Executive Committee to consider additional funding for institutional strengthening projects to enable Article 5 governments to assume greater responsibilities;

To note the Secretariat's proposed approach to implementing Decision 33/54 as detailed in paragraph 3 of document UNEP/OzL.Pro/ExCom/34/53, and to request the Secretariat, as a matter of urgency, to use that approach and issues related to the implementation of Decision 33/54 raised by Executive Committee members prior to the 36th Meeting, including those in document UNEP/OzL.Pro/ExCom/35/60, Annex I, as a basis for preparing for the Executive Committee at its 36th Meeting an indicative timetable for this task.

Study on defining a starting point for determining the remaining ODS consumption eligible for funding by the Multilateral Fund: follow-up to Decision 34/66 (a)

A representative of the Secretariat introduced document UNEP/OzL.Pro/ExCom/35/61, "Study on defining a starting point for determining the remaining ODS consumption eligible for funding by the

Multilateral Fund: follow-up to Decision 34/66 (a)”, which had been prepared by the Secretariat in accordance with Decision 34/66 (a), taking fully into account the alternative approaches to be used in determining a baseline, as outlined in paragraph 89 of the report of the Executive Committee at its 34th Meeting (UNEP/OzL.Pro/ExCom/34/58). He explained that the objective of the paper was to provide statistical analysis to be used by the Committee for decision-making on the starting point for determining the remaining ODS consumption eligible for funding. The analysis covered Annex A CFCs only, as they accounted for 78 per cent of ODS consumption by Article 5 countries.

The representative of the United States of America introduced a conference room paper submitted by his Government, entitled “Proposal for implementing the first phase of the Strategic Framework adopted by the Executive Committee at its 32nd Meeting”.

Several representatives supported the methodology proposed and the conclusions contained in the Secretariat’s paper. Pointing to the importance of a country-driven approach, they considered that offering two alternative methods for the determination of a starting point from which to calculate the remaining ODS consumption that would be eligible for funding would enable an Article 5 country to select the method most suited to its national compliance strategy. One representative stressed the importance of not imposing any one methodology on the Article 5 countries for determination of the starting point.

Some representatives, while considering the Secretariat’s paper a good basis for discussion, stressed that, during the deliberation of the strategic planning exercise, the Article 5 countries had raised a number of concerns, which the paper did not address. Since the Article 5 countries attached great importance to their commitments under the Protocol, the selection of the methodology for calculating the starting point represented an important decision for them.

They thus sought to ensure that their concerns would be addressed in a flexible manner, in order to select the best possible methodology. Concerning the choice of consumption data for specific years only, attention was drawn to the limitations of such a procedure, including how to account for fluctuations, and the problems inherent in data collection in Article 5 countries, particularly taking into account factors such as stockpiling, illicit trade, and recycling. In that connection, it was observed that, if a country believed that its data for a specific period were non-representative, a procedure could be established whereby a country could submit justification to the Executive Committee for consideration of a different starting point.

While the view was expressed that country programme updates could be useful in determining the starting point, it was also considered that it was necessary for there to be a link between the consumption data and a Party’s obligations under the Protocol. Data from country programmes had a

different status from the data reported under Article 7 of the Protocol, and provided no direct legal link to a country's phase-out obligations.

Several representatives welcomed the proposal prepared by the United States of America, and considered it a useful and constructive basis for progress on the issue.

A number of representatives considered that the starting point from which to calculate ODS consumption that would be eligible for funding should use the baseline already calculated in accordance with Article 7 of the Montreal Protocol, which was based on three years' data reporting. One representative cautioned that differences in data arising from the use of differing calculation methodologies could lead to errors and possible waste of Fund resources.

It was stressed that, no matter what approach was chosen for determining the starting point for calculation of ODS consumption that would be eligible for funding, the sole means of determining compliance by a Party would continue to be the baseline calculated on the basis of data submitted by Parties in accordance with Article 7 of the Protocol.

One representative underlined the importance of a clear understanding of the concept of a permanent national aggregate reduction in consumption within the strategic plan, which represented an important operational tool for implementing phase-out. He considered that, whatever approach a Party used to determine its starting point, it had to be predicated on a commitment to such permanent national aggregate reductions in consumption of ODS.

It was clarified that the document entitled "Study on defining a starting point or determining the remaining ODS consumption eligible for funding by the Multilateral Fund: follow-up to Decision 34/66 (a)" had been updated (UNEP/OzL.Pro/ExCom/35/61/Corr.1) to take account of the receipt of data for the year 2000 from the Government of India.

Following the discussion, an informal, open-ended contact group was set up to address the outstanding issues under the sub-item. An oral report was given on the work of the contact group, which had based its deliberations on the conference room paper submitted by the United States of America. It was explained that, with regard to option 2 for determining the baseline for implementation of national aggregate consumption, the data reported to the current Meeting, as provided to the Secretariat, would be used in the future, subject to any factual corrections to be made, for example because a project listed as completed had in fact not been completed. It had been agreed that it was too late for a country to use data for the year 2000, if these had not already been submitted to the Secretariat. Concerning the impact of this decision on the upcoming replenishment of the Multilateral Fund, the group had noted that the Technology and Economic Assessment Panel had

traditionally used historical data, and it was likely to use the latest available data for its upcoming analysis. In any case, there could be sensitivity analysis, regardless of the data used by the Panel.

Concerning the funding of institutional strengthening projects and their renewal, it was clarified that an augmentation of funding applied to new such project proposals only, and not to those already approved. After a discussion among several participants, the Executive Committee decided:

Decision 35/57

Institutional strengthening: All institutional strengthening projects and renewals shall be approved at a level that is 30 per cent higher than the historically agreed level. This will help countries carry out the new strategic framework agreed, and provide increased support for critical areas such as public awareness. The level of institutional strengthening funding noted above should prevail until 2005 when it should again be reviewed. This proposal would also include a clear commitment that this level of institutional strengthening or a level close to it should prevail for all Article 5 Parties until at least 2010, even if they should phase-out early. It should also be noted that, in addition to this direct increase in institutional strengthening funding, UNEP will, as agreed in 2000, be provided with US \$200,000/year to support public awareness, and countries will receive enhanced direct support on policy and substantive issues through UNEP's new Compliance Assistance Programme. Finally, it should be noted that countries undertaking national phase-out plans are likely to receive institutional strengthening funding at an even higher level than that anticipated above to facilitate national project implementation, as explicitly agreed in related phase-out agreements.

Country programme updates: Countries shall be provided with country programme update funding that is 75 per cent of the level originally provided to them to do country programmes. Low-volume consuming countries that have done RMPs will be given 50 per cent of the funding provided to develop their original RMP to do RMP updates, but will not be given funding to do country programme updates. New country programmes should, consistent with existing Executive Committee guidelines, continue to include RMPs.

Reductions in national aggregate consumption: In the context of the Executive Committee agreement on strategic planning (Decision 33/54 (a)), the Executive Committee agreed that further funding must be predicated on a commitment by the country to achieve sustainable permanent aggregate reductions in consumption and production, as relevant. In implementing this provision, the Executive Committee believes that all Article 5 countries should be treated equally. In that regard, each Article 5 country should select one option from two options below for determining the starting point for implementation of its national aggregate consumption.

Option 1

Montreal Protocol Baseline as reported at the 35th Meeting less projects approved but not yet implemented when the baseline was established in 1997, and projects approved since.

Option 2

Latest Reported Data (1999 or 2000) as reported at the 35th Meeting less projects approved but not yet implemented.

Provisos relating to the decision

- A. If an Article 5 country selects option 2, it should be with the understanding that the Executive Committee may agree in exceptional cases to adjust the resulting baseline at the first instance a project from a country is considered, to take into account the demonstrated non-representative nature of the last year's data for reasons such as clearly demonstrated stockpiling in the specific 12-month period, and/or national economic difficulties in the specific 12-month period. In so considering, the Executive Committee shall not take into account illegal imports, as there should be agreement that firms that import illegally, or purchase illegal imports, should not benefit from Fund assistance. In any case, it must be perfectly clear that only the Montreal Protocol baseline will be used to determine compliance with the Montreal Protocol.
- B. It is acknowledged that some future years' reported consumption may go above or below the levels that result from the agreed calculation, but if consumption numbers go above the resulting levels, such increases in consumption would not be eligible for funding. It is further noted that the resulting numbers represent maximum residual ODS that the Fund will pay to reduce, and that existing Fund guidance related to eligibility of projects would be maintained in all respects.
- C. It is noted that RMPs and methyl bromide projects lead to a specific commitment of levels of reductions in national aggregate consumption relative to Montreal Protocol obligations, and that halon banking projects often lead to commitment for a total national phase-out and ban on the import of halon. Those projects should continue to be handled on that basis.
- D. Institutional strengthening and non-investment activities, including UNEP activities and any country dialogues that may be approved, undeniably contribute to Article 5 reductions in the use of ODS, otherwise, there would be no need to fund these activities. That said, their direct ODS reduction impact has been notoriously difficult to quantify. The

Technology and Economic Assessment Panel historically suggested that for methyl bromide, non-investment activities may be five times more cost-effective than phase-out projects, yielding a cost-effectiveness of under US \$4.25/kg. For the purposes of this endeavour, it has been agreed to take a much more conservative stance, and agreed that all future non-investment activities be given a value that is not many times more cost-effective than investment projects, which is at US \$12.10/kg, which is one third as cost-effective as the average investment project approved under the Fund. This should be used as an interim figure until more research can be done on the issue.

- E. While countries are still explicitly given the option of proceeding on a project by project or sector/national basis, it should be noted that in the case of broader plans such as production sector plans, RMPs, solvents sector plans, halon sector plans or national CFC phase-out plans, complicated issues such as selecting a starting point and ensuring national sustained reductions become less critical, as the agreements themselves embody a specific commitment to eliminate national aggregate consumption or production of the given substance on a specific schedule.

Annex 2: Specific Achievements of the Multilateral Fund

A2.1 Investment Project Approvals (1991-2001)

During 1991-2001, inclusive of the 35th Executive Committee meeting held in Montreal, December 2001, a large number of projects were approved covering a certain ODP tonnage. A summary has been compiled from extensive spreadsheet data published by the Multilateral Fund Secretariat /MFS02/. It is given in Table A2-1 for each of the Country Categories and for the different application sectors. Information from the table yields that through 2001, 116,611 ODP-tonnes of controlled substances were addressed in approved projects. The ODP-tonnes to be phased out by approved projects are used in the model for the consumption sector (see the body of the report).

Table A2-1 ODP-tonnes to be phased out by projects for Article 5(1) Countries approved through December 2001, for the different sectors (CFCs)

	Aerosols	Foams	Refrigeration	Solvents	Other
Category 1	19,920	37,189	20,081	2,399	300
Category 2	2,092	17,668	12,435	506	468
Category 3	2,580	3,356	2,444	55	690
Category 4	922	774	1,248		
Category 5	50	649	605		18
Sector-totals	25,564	59,636	36,813	2,960	1,476
TOTAL CFC	116,611				

A2.2 Project Approvals 2002

Although the definite project approvals for the year 2002 were not known at the time of the completion of this report, information can be taken from the Consolidated 2002 Business Plans of the Implementing Agencies, which were published in the report of the 36th Executive Committee Meeting /ExC02/.

These business plans provide insight in the Implementing Agencies' plans to submit projects in 2002 for the different controlled substances.

The Consolidated Business Plans give total values for the amounts expected to be approved in 2002. The funding requested is stated to address 9,836 ODP-tonnes of CFCs (excluding the ODP-tonnes in the production sector).

Table A2-2 ODP-tonnes (CFCs) to be phased out by projects expected to be approved for Article 5(1) Countries in 2002 according to the consolidated business plans of the Implementing Agencies /ExC02/

Country Category	Total ODP-tonnes 2002 (CFCs)
Category 1	6,394.0
Category 2	2,634.0
Category 3	489.0
Category 4	119.7
Category 5	199
Total	9,835.7

In this report the model that has been used is based on the assumption that the amount of CFCs are phased out in those sectors where there is still substantial consumption (which may imply the application of CFC phase-out projects in more than one sector for each country). In fact, all the values given for project approvals expected in 2002 define the sub-sector (and, in fact, the industry concerned).

A2.3 Comparison of CFC Consumption in the Country Categories

It is useful to investigate how the consumption levels have been in the different country categories over the period 1995-2000, and to look at the percentages consumption of the total annual consumption in each of the categories.

Table A2-3 shows these values for the reference years (the baseline consumption), as well as the years 1998, 1999 and 2000, all from data reported to UNEP.

The following can be observed:

- Countries in Category 1 have reduced their part in the total consumption from approximately 65 to 60% between 1995 and 2000; after 1998 the percentage has been more or less constant;
- Countries in Category 2 have more or less maintained their percentage of 27% in the total consumption from 1998 through 2000; it was somewhat smaller before 1996;
- Almost 90% of the total consumption can be found in the 18 countries in Category 1 and 2;
- Countries in Category 3 have increased their percentage in the total consumption in the total slightly, from 6.5 to 7.5% between 1995 and 2000;
- Countries in Category 4 have constantly increased their (small) percentage over the period 1995-2000 and are at a level slightly higher than 4%;
- Countries in Category 5 have increased their percentage as well, from 1 to 1.3% over the five year period concerned.

Table A2-3 *Total amount of ODP-tonnes reported by the different Categories of countries for the years 1995, 1998, 1999 and 2000 and the proportion of the total consumption of the different country categories for these years. For the baseline 1995-97 consumption calculated (figures given in Table A2.4) the percentages in the total have been given.*

Country Category				
Year	1995		1998	
Category 1	109,188	64.8%	80,188	61.6%
Category 2	41,280	24.5%	35,779	27.5%
Category 3	11,624	6.9%	8,511	6.5%
Category 4	4,876	2.9%	4,012	3.1%
Category 5	1,624	1.0%	1,583	1.2%
Total	168,593		130,073	

Country Category					1995-97 baseline
Year	1999		2000		
Category 1	68,214	60.3%	62,982	60.0%	60.4%
Category 2	30,214	26.7%	28,606	27.3%	27.6%
Category 3	8,563	7.6%	7,651	7.3%	7.6%
Category 4	4,751	4.2%	4,307	4.1%	3.3%
Category 5	1,466	1.3%	1,375	1.3%	1.0%
Total	113,210		104,921		

It is useful to study how the different categories of countries (Categories 1-5) have been supported by investment project approvals during 1991-2001 and by expected project approvals during 2002. One needs to study Table A2-4.

In a first instance one can compare the cumulative approvals with the baseline consumption values calculated for each of the Country Categories. Such a comparison has merit for analysis only as it does not mean that the resulting percentage of the baseline to be addressed by projects is ready for phase-out. Instead, the actual values are lower because such a comparison of cumulative figures against current ones, overestimates the part addressed by projects.

The overall figure is that, of the averaged reported 1995-1997 CFC consumption (the baseline), 73.2% of the ODP-tonnes (CFCs) is addressed by project approvals up to and including 2002. For the second and third Category of Article 5(1) countries, the percentages of averaged 1995-1997 ODP-tonnes addressed in project approvals are not so much different (80-82%). The lowest percentages are determined for countries in Category 4, i.e. for the countries with a CFC consumption (averaged over the years 1995-1997) lower than 360 ODP-tonnes, but higher than 100 ODP-tonnes. Here a value of 60% can be determined. The highest values (project ODP values

compared to the baseline ODP value) can be observed for both Category 1 (89%) and Category 5 (86%). Values have changed significantly since the last Replenishment Study /RTF99/.

Table A2-4 *Total amount of CFCs (ODP-tonnes) to be phased out by projects approved as of December 2001 and by those expected to be approved in 2002 /ExC02/, as well as the percentage of the total of approvals of the “freeze” consumption*

Country	Approvals as at December 2001	Approvals for 2002 (expected)	Total ODP-tonnes in approved projects 1991-2001 and in 2002	Total 1995-7 consumption average data estim. From reported data /UNEP02/	Total ODP-tonnes as a percentage of the total 1995-1997 categories consumption baseline data
Category 1	73,495	6,394	79,889	89,440	89.3%
Category 2	30,534	2,634	33,168	40,898	81.1%
Category 3	8,635	489	9,124	11,323	80.6%
Category 4	2,825	119.7	2,945	4,916	59.9%
Category 5	1,123	199	1,322	1,544	85.6%
Total	116,611	9,836	126,447	148,121	73.2%

These values should only be considered in a relative sense because:

- some of the approvals have already (in the years before 1995) phased out a certain part of the consumption which is not part of the average 1995-1997 consumption;
- certain countries have had higher growth than others in their CFC consumption during the period 1995-1997 and beyond.

In order to compare with approvals in more recent years, tables A2-5 and A2-6 give the figures of the ODP-tonnes approved –or expected to be approved– as a function of the 1998, the 2000 and the average 1995-1997 consumption.

Table A2-5 gives the CFC consumption levels for the years 1995-1997, 1998 and 2000 and the total amount of CFC ODP-tonnes involved in approvals through 2001. Percentages are given from which it can be concluded that the increase of the percentages in the year 2000 is caused by the consumption and not by the constant amount of ODP-tonnes approved that has been used to calculate the percentages. Lowest amount of approvals can be found in the Categories 4 and 5, and particularly in the Category 4 (100-360 ODP-tonnes).

Table A2-5 *Total amount of ODP-tonnes involved in projects versus the total 1994, 1996 and average 1995-97 consumption data for the five Country Categories; the approvals are given as a percentage of the three different consumption levels*

Country Category	Total ODP - tonnes in projects 1991-2001	The baseline 1995-7 and the 1998 and 2000 consumption data estimated from reported Data /UNE02/			ODP-tonnes approved (or expected) as a percentage of the 1998, the 2000 and the baseline 1995-7 consumption data		
		1995-97	1998	2000	1995-97	1998	2000
Category 1	73,495	89,440	80,188	62,982	82.2%	91.7%	116.7%
Category 2	30,534	40,898	35,779	29,129	74.7%	85.3%	104.8%
Category 3	8,635	11,323	8,511	7,651	76.3%	101.5%	112.9%
Category 4	2,825	4,916	4,012	4,307	57.5%	70.4%	65.6%
Category 5	1,123	1,544	1,583	1,392	72.7%	70.9%	80.7%
Total	116,611	148,121	130,073	105,462	78.7%	89.7%	110.4%

A slightly better picture is given in Table A2-6, because here the project approvals for the years 2000, 2001 and expected for 2002 are given and they are compared with the CFC consumption for the year 2000. The number of approvals increases over the period 2000-2002, from about 7,200 to 9,800 ODP-tonnes (a 35% growth). It can be observed that, relatively spoken, particularly the approvals in Categories 1, 4 and 5 increase over the years concerned. The approvals have been converted into three different columns (not reflected in the table) in which the cumulative approvals were given, i.e. the approvals during 2000, during 2000 and 2001 and the approvals during 2000, 2001 and 2002. These three types of values have been compared to the 2000 CFC consumption and the percentages are given in Table A2-6. For the approvals over the years 2000 and 2001 the percentage is roughly the same for the countries in Categories 1, 2, 3 and 5, with the highest values for the countries in Categories 1 and 5. Clearly it can be seen that the value for Category 4 is significantly lower, i.e., these countries really get a much lower chance to decrease their consumption through approvals. This is shown for the years 2000-2001, but it becomes even more clear for the period 2000-2002 where relatively spoken the countries in Category 4 get only 10% of their consumption addressed in project approvals, which is only 35-40% of the approvals (in a relative sense) for countries in other Categories.

It should be emphasised that the tables given are for relative comparisons only, one cannot derive from them absolute values, or remaining consumption (eligible for funding) since the tables do not take into account implementation or tonnes already implemented. They clearly demonstrate trends.

Table A2-6 *Total amount of ODP-tonnes involved in projects approved in the years 2000, 2001 and probably approved in the year 2002, versus the 2000 consumption data for the five Country Categories. The cumulative approvals (i.e., the years 2000, 2000-2001 and 2000-2002) are also given as a percentage of the 2000 consumption*

Country Category	CFC Consumption in year 2000	ODP-tonnes approved in projects for the years 2000, 2001, and 2002 (expected)			ODP-tonnes approved (or expected) in a cumulative form for 2000, 2000-2001 and 2000-2002 as a percentage of the 2000 consumption data		
		2000	2001	2002	2000	2000-2001	2000-2002
Category 1	62,982	4,493.0	5,827.1	6,934.0	7.1%	16.4%	26.5%
Category 2	29,129	2,249.8	1,976.9	2,634.0	7.7%	14.5%	23.6%
Category 3	7,651	421.9	702.9	489.0	5.5%	14.7%	21.1%
Category 4	4,307	73.2	272.5	119.7	1.7%	8.0%	10.8%
Category 5	1,392	47.2	196.4	199.0	3.4%	17.5%	31.8%
Total	105,462	7,285.1	8,975.8	9,835.7	6.9%	15.5%	24.7%

In order to find out how the consumption of Article 5(1) countries is affected by the implementation of projects, a different table has been constructed. This table consists of the sum of the consumption and the cumulative amount of implemented projects in ODP-tonnes.

In a spreadsheet the approvals per year have been inserted for the years 1991-2000. From the approvals in a given year the amounts implemented in the years thereafter using the implementation lag function have been calculated (same implementation lag for all sectors in all Country Categories). This has been done for all the separate years 1991 through 2000. In a next step all ODP-tonnes implemented in a given year per country category, have been added. This yields the cumulative amount of implemented ODP-tonnes per year.

To the cumulative amounts the CFC consumption in ODP-tonnes as reported to UNEP for a given year for a certain Country Category has been added.

Once these values are available, conclusions can be drawn:

- ❑ if the table shows a constant character (in ODP-tonnes) over the years, it means that the CFC consumption is only decreased by the amount of ODP-tonnes implemented;
- ❑ if the table shows a decrease (in ODP-tonnes) over the years, it means that other factors than just project implementation have also played a role;

- if the table shows an increase (in ODP-tonnes) over the years, then the consumption of countries has increased (in spite of other factors that may have caused a decrease).

Table A2-7 *Total amount of ODP-tonnes reported and the cumulative value of the ODP-tonnes addressed in implemented projects through the year 2000 for the different categories of countries.*

Year	1994	1995	1996	1997	1998	1999	2000
Category 1	109,723	121,466	99,443	106,190	112,263	110,485	113,553
Category 2	46,637	44,708	48,146	53,036	51,004	49,655	51,037
Category 3	8,002	12,050	12,241	12,474	11,678	13,449	13,709
Category 4	3,961	5,137	5,836	5,526	5,337	6,592	6,502
Category 5	1,347	1,681	1,758	1,913	2,049	2,085	2,129
Total	169,670	185,042	167,424	179,138	182,331	182,265	186,930

Table A2-7 shows that there are fluctuations during 1994-97 which cannot be explained; they must be due to sharp fluctuations in the consumption of countries. The table shows that countries have increased their consumption by about 3,000 ODP-tonnes globally during 1997-1999 and by another 4,000 ODP-tonnes globally during 1999-2000. This occurred while the project implementation itself caused a decrease of the CFC consumption in absolute sense (compare Table A2-3). Whereas the trend is not so clear for the countries in the Categories 1 and 2, it is particularly the countries in Categories 3, 4 and 5 where the total values (consumption plus ODP-tonnes implemented) have increased during 1998-2000.

A conclusion, which can be drawn, is that the consumption of the Article 5(1) countries is not much influenced by all kinds of external effects, if at all. It is actually mainly the implementation of approved projects that reduces the consumption. However, it is quite interesting to see that there is no significant other trend upward or downward (even when not considering an implementation lag for the projects approved in 1998-2000). It had not been expected that these values would be as “constant” over the years as they are. It also implies that there is no real support for the conclusion that non-investment activities have had a clear impact on the consumption profile in most countries, at least not through the year 2000.

Annex 3: Control Schedules

A3.1 Compliance with the Control Schedules

The individual Parties, respectively, are responsible for their own compliance with the control schedules.

External financial assistance and technology transfer are essential to the phase-out process. Recognition of these needs led to the establishment of the Multilateral Fund. The Multilateral Fund is mandated to assist the Article 5(1) countries to comply with the control schedules of the Montreal Protocol.

The resources to be made available through the 2003-2005 replenishment of the Multilateral Fund will be instrumental in making it possible for the Article 5(1) countries to meet their, respective, incremental costs in securing progressive compliance with all the control measures.

A full description of all control measures for all controlled substances is given in Table A3-1.

Where it concerns the reduction in consumption for methyl bromide beyond 2005, Decision IX/5 should be referred to: "Conditions for the Control Measures on Annex E Substances in Article 5(1) Parties", which mentions in 1(e) "In light of the Assessment by the Technology and Economic Assessment Panel.... the Meeting of the Parties shall decide in 2003 on further specific reductions on methyl bromide for the period beyond 2005 applicable to Parties operating under paragraph 1 of Article 5". This report used the current control schedule in the analysis because it was not feasible to predict the outcome of the Parties' discussions.

Table A3-1 Control Schedules for Article 5(1) Countries

Annex A – Group I (Production and Consumption)	
Chlorofluorocarbons: CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115	Base level: average of 1995-97 Freeze: July 1, 1999* 50 percent reduction by January 1, 2005 * 85 percent reduction by January 1, 2007 * 100 percent reduction by January 1, 2010 (with possible exemptions for essential uses) **
Annex A - Group II (Production and Consumption)	
Halons: halon 1211, halon 1301 and halon 2402	Base level: average of 1995-97 Freeze: January 1, 2002* 50 percent reduction by January 1, 2005 * 100 percent reduction by January 1, 2010 (with possible exemptions for essential uses) **
Annex B - Group I (Production and Consumption)	
Other fully halogenated CFCs CFC-13, CFC-111, CFC-112, CFC-211, CFC-212, CFC-213, CFC-214, CFC-215, CFC-216, and CFC-217	Base level: average of 1998-2000 20 percent reduction by January 1, 2003 * 85 percent reduction by January 1, 2007 * 100 percent reduction by January 1, 2010 (with possible exemptions for essential uses) **
Annex B - Group II (Production and Consumption)	
Carbon Tetrachloride	Base level: average of 1998-2000 85 percent reduction by January 1, 2005 100 percent reduction by January 1, 2010 (with possible exemptions for essential uses)
Annex B - Group III (Production and Consumption)	
1,1,1-trichloroethane (methyl chloroform)	Base level: average of 1998-2000 Freeze: January 1, 2003* 30 percent reduction by January 1, 2005 * 70 percent reduction by January 1, 2010 * 100 percent reduction by January 1, 2015 (with possible exemptions for essential uses) **
Annex C - Group I (Consumption)	
HCFCs	Base level: 2015 Freeze: January 1, 2016 100 percent reduction by January 1, 2040
Annex C, Group II (Production and Consumption)	
HBFCs	100 percent reduction by January 1, 1996 (with possible exemptions for essential uses)
Annex E (Production and Consumption) (exemption for quarantine and pre-shipment)	
Methyl Bromide	Base level: Average of 1995-1998 Freeze: January 1, 2002 * 20 percent reduction by January 1, 2005 100 percent reduction by January 1, 2015

* 10% of base level of production allowed to be produced additionally to meet the basic domestic needs of Parties operating under Article 5(1).

** 15% of base level production allowed to be produced additionally to meet the basic domestic needs of Parties operating under Article 5(1).

Annex 4: Production - Consumption Aspects: CFCs, Halons, CTC and TCA

A4.1 CFC Production and Consumption

One can calculate the production in all developed countries (including CEITs) and the production in all Article 5(1) countries (including the Republic of Korea). In a next step one could subtract the consumption in the CEITs and in the Republic of Korea and the production quantities for MDIs (in the developed countries). In this way one could derive the production for Basic Domestic Needs (BDN). However, the size of the production in the CEITs, i.e. the Russian Federation (14-26,000 ODP-tonnes during 1998-2000) and the production/ consumption in the Republic of Korea (5,500-7,500 ODP-tonnes during 1998-2000) leads to the introduction of variables that have a definite influence on the outcome. Some results are shown in Table A4-1. E.g. the amount of CFCs remaining available for Article 5(1) countries (including the Rep. of Korea and others) and for MDI production in 2000 is 107,226 ODP-tonnes; however, the consumption for the Article 5(1) countries that receive Multilateral Fund support was almost 106,000 ODP-tonnes (see chapter 2). This indicates that there is an imbalance between production and consumption for Article 5(1) countries. This procedure is at least difficult, or rather, the importance of the results cannot be easily estimated if one needs to study the production versus the consumption in and for Article 5(1) countries, caused by the impacts of the consumption in countries that are normally not considered.

Table A4-1 CFC (ODP-tonnes) production in all developed countries, including CEITs. The second and third columns give the production in all Article 5(1) countries and the global production. By subtracting the consumption in the CEITs the remaining amount for Article 5(1) countries can be derived (Article 5(1) consumption plus production for BDN plus MDIs). In the last column the amount available for Article 5(1) countries that receive Multilateral Fund support is contained. Data have all been derived from the database provided by the Ozone Secretariat /UNEP02/

Year	Production Developed	Production all Art 5(1)	Global Production	Consump. CEITs	Remaining for all Art 5(1) and MDIs
1996	50,804	100,777	151,581	16,636	134,945
1997	49,070	109,694	158,764	14,254	144,510
1998	45,985	100,899	146,884	15,081	131,803
1999	49,422	97,358	146,780	17,564	129,216
2000	52,808	80,562	133,370	26,144	107,226

Therefore a different approach has been chosen. In Table A4-2 the production in Article 5(1) and non-Article 5(1) Parties is presented for the years 1996 through 2000, derived from the data that have been officially

submitted to the UNEP Ozone Secretariat. Table A4-2 also presents the 1996-2000 consumption data for all Article 5(1) Parties. The data are presented for all countries, including the ones that do not ask financial assistance from the Multilateral Fund, with the exception of the consumption and production data for the Republic of Korea. The produced amounts in the Republic of Korea are assumed to cover the domestic needs of the Republic of Korea only and they are therefore not considered in this table. Due to a slight increase in the number of countries, the consumption data presented in this Annex will be slightly higher than the data presented elsewhere in this report. This needs to be done in order to analyse the production versus consumption data (CFCs are also exported to those countries that do not ask MLF assistance).

Furthermore, in the case of the developed countries, the production in the Russian Federation has not been taken into account; certain amounts may have been exported here to Article 5(1) countries. Particularly since production data show that the CFC production in the Russian Federation in the year 2000 was more than double the production in the years 1997 and 1998. However, since production in the Russian Federation has been halted after the year 2000, this aspect has not been taken into further account in this report; however, export from stockpiles may certainly have continued after the year 2000.

The developed country production data given in Table A4-2 consist of the production data reported to UNEP (by the countries Greece, Italy, Netherlands, Spain, USA) minus the quantities used for MDIs (production for “Basic Domestic Needs”, BDN). The CFC quantities used in MDIs in the developed countries are known from existing essential use exemptions and trends are known based upon information from the ATOC /ATOC98 and updates/.

It should be emphasised that the consumption figures in the table are substantially larger than the ones given in the 1999 Replenishment study. This is due to the fact that several countries have revised their data in the upward direction, and particularly due to the fact that the growth in CFC consumption during 1997-2000 has been more than anticipated in the 1999 study.

In the years 1996 and 1997, annual production in the Article 5(1) countries was about 100,000 ODP-tonnes, of which approximately 75% was produced in Asia and 25% in Central and South America. According to the data, this was about 40,000-50,000 ODP-tonnes less than the reported consumption. The larger part of this residual amount is assumed to have been produced in the non-Article 5(1) countries under the BDN clause of the Montreal Protocol. However, there must have been more sources than only this BDN production.

Table A4-2 CFC production and consumption for all Article 5(1) Parties as reported to UNEP (ODP-tonnes * 1000) for the years 1996 through 2000. The Table also contains the results of calculations for the CFC consumption from this study on the replenishment of the Multilateral Fund during 2003-2005; to these figures the estimated consumption of Article 5(1) countries that do not ask MLF assistance has been added.

Year	Article 5(1) CFC Cons.	Article 5(1) CFC Prod.	BDN Production	Total Production	Difference Prod-Cons
1996	142.80	92.16	27.60	119.76	-23.04
1997	140.70	100.45	27.00	127.45	-13.25
1998	133.50	95.37	24.53	119.88	-13.62
1999	116.25	90.12	24.16	114.28	-1.97
2000	107.31	73.33	21.49	94.82	-12.49
2001	93.98	66.9 - 75.5	21.0 - 30.0	87.9 – 105.5	-6.1 / +11.5
2002	84.42	60.6 - 70.3	15.2 - 21.5	75.8 – 91.8	-8.6 / +7.4
2003	74.96	54.6 - 65.4	12.8 - 21.5	67.4 – 86.9	-7.5 / +12.1
2004	64.24	46.8 - 58.9	10.8 - 21.5	57.6 – 80.4	-6.6 / +15.9
2005	58.83	37.2 - 40.2	10.3 - 14.2	47.5 – 54.4	-11.3 / -4.4
2006	46.96	25.5 - 31.1	8.3 - 13.2	33.8 – 44.3	-13.2 / -2.7
2007	22.80	15.1 - 16.1	3.4 - 4.0	18.5 – 20.1	-4.3 / -2.7
2008	15.20	11.1 - 12.7	2.3 - 4.0	13.4 – 16.7	-1.8 / +1.5
2009	7.60	5.0 - 7.4	1.2 - 4.0	6.2 – 11.4	-1.4 / +3.8
2010	0	0	0	0	0

Note: The production levels given for the period 2000-2010 have been derived from the agreed production levels for China and India, from estimates for the production in other Article 5(1) countries, and from calculations that determine the compliance levels in 2005, and 2007, based upon the 1995-97 base level. Data for the BDN production can be added to the Article 5(1) production data, and a difference between the production for and the consumption in Article 5(1) countries can be calculated. The value for (production – consumption) is given as a range where the lower value in the range denotes a shortage in production for the Article 5(1) countries (see text).

In 1996-1997, the Non-Article 5(1) countries had a production level of approximately 35,000 ODP-tonnes, from which 8-9,000 ODP-tonnes need to be subtracted for “essential uses” in the non-Article 5(1) countries (MDIs). The difference of 27,000 ODP-tonnes has been exported to cover Article 5(1) BDN. However, the figures in the table suggest that there must have been a considerable imbalance between supply and demand in the Article 5(1) countries, at a level of 13,000 ODP-tonnes globally, during 1997-98.

However, the more or less stable CFC prices during the period 1995-98 suggest that there has not been a shortage in the supply of CFCs to the Article 5(1) countries during this period. The only explanation that can be given in this case is that there has been trade in stockpiled substances, there has been export from certain CEIT countries, or that consumption in the Article 5(1) countries has been over-reported, which is less likely. In 1999 the imbalance

had disappeared for the larger part, however, the imbalance increased again substantially in the year 2000 (due to halting of the production in Brazil).

Similarly, in the period 1999-2000 there has been no real increase in CFC prices, so that there must be some kind of explanation how the demand in Article 5(1) countries has been covered. This, however, does not imply that the same “mechanisms” will occur in future.

Table A4-2 presents estimates for the consumption beyond 2000 derived from spreadsheet calculations (see chapter 4) assuming the implementation of projects approved throughout the year 2005 together with the Montreal Protocol compliance schedule (50% of the baseline in 2005, 15% in 2007, phase-out in 2010).

Table A4-2 also presents the production quantities estimated for the years 2001-2010 in the form of a range:

- the lower value represents the production quantities agreed for China and India plus the production in the other Article 5(1) countries departing from the production reported for the year 2000, with a linear decrease towards the year 2005, and following the Montreal protocol compliance schedule with a linear reduction between 2005-2007 and 2007-2010;
- the upper value represents the production quantities agreed for China and India plus the production quantities in the other Article 5(1) countries at the *maximum* value that they can produce under the Protocol (i.e. freeze plus 10% BDN production level until 2005, 50% plus 10% BDN production level until 2007, and 15% plus 10% BDN level until 2010).

What remains is the production in the non-Article 5(1) countries for Basic Domestic Needs. Estimates have been obtained for the BDN production for 2001 and 2002 based upon information from manufacturers. The production in the Netherlands (for MDIs and BDN) which peaked at 15,720 ODP-tonnes in 1999, will sharply decrease to about 5,500-6,000 ODP-tonnes in the year 2002, following an agreement of the manufacturer with the Dutch government. It implies that there will be a BDN production of about 500-1,000 ODP-tonnes as of the year 2002 in the Netherlands. This production in the Netherlands will be halted by 31/12/2005. It is not known what the BDN production quantities in the other European countries will be during 2002-2010; it may well be that they will show an increase for the short term, i.e. for the years 2002-2005, and maybe thereafter.

The estimates for BDN production given in table A4-2 are again presented as a range:

- the lower level presents estimates obtained by taking the BDN production from 2000 with a decrease towards the year 2005 (also caused by the decrease in the Netherlands), and with further decrease between 2005 and 2010;

- the higher level assumes that the BDN production quantity in the Netherlands will be “transferred” to other non-Article 5(1) countries, and it is assumed that it will remain at a level of 21,000 ODP-tonnes until 2005; thereafter it is assumed to decrease to about 4,000 ODP-tonnes in the period 2007-2009.

It is clear that one can derive a range for the difference (production minus consumption). It is shown that:

- if there would be no BDN production in non-Article 5(1) countries, shortages in supplies for the Article 5(1) countries would occur, in the order of 6,000 to 18,000 ODP-tonnes, dependent on the year considered;
- if the Article 5(1) countries (those countries that have no production agreements) do not maintain as much as possible their maximum allowable production levels (production plus production for their own basic domestic needs), a shortage is likely to occur, if at the same time BDN production is substantially reduced in the non-Article 5(1) countries. The level of this shortage will be influenced by the level of BDN production in the non-Article 5(1) countries;
- if the Article 5(1) countries maintain their maximum allowable production levels, the production for BDN can be reduced in the non-Article 5(1) countries during the period 2002-2004, however, a further decrease during 2005-2007 will lead to shortages and possibly to impacts on price levels;
- with the consumption calculated (from the implementation of projects) it will be so that during the period 2005-2007 there will be a shortage on the market, even if developing countries would produce at the maximum allowed level and the BDN production in the developed countries is at a level of 14,000 ODP-tonnes; the difference between production and consumption is then likely to be in the order of 3,000 ODP tonnes;
- the shortage in the period 2005-2007 could be overcome by stockpiling parts of the production in the years 2002-2004; however, this indeed assumes that several Article 5(1) countries increase their production levels compared to the year 2000 (i.e., the Article 5(1) countries with no production agreement);
- the shortage (imbalance) on the market will have disappeared in the years 2008-2009, shortly before the phase-out;
- if agreements would be signed with Article 5(1) CFC producing countries to limit their production during 2003-2005, it will very much depend on the level of the production in the non-Article 5(1) countries which shortage in CFC supplies will occur globally.

It should however be emphasised that next to the uncertainties in the estimates for production and consumption, there is always the uncertainty how much can be covered from existing stockpiles, as well as from illegal

practices, and furthermore, the question is whether recovery and recycle can have a significant effect on the demand.

A different aspect needs to be mentioned here. An early ban on CFC sales from non-Article 5(1) to Article 5(1) countries may make plants in the Non-Article 5(1) countries financially non-viable. As a result, companies would need to either manufacture and stockpile quantities of medical grade CFC necessary to complete the transition to CFC-free MDIs, develop Article 5(1) suppliers that are approved by national regulatory bodies (a lengthy process), or would need to pay higher prices to maintain CFC production.

The above complicates the issue where which amounts of CFCs should be produced (in Article 5(1) countries, or in both non-Article 5(1) and Article 5(1) according to the “historical” pattern, in the years through 2005, to cover the demand from Article 5(1) countries and the demand for CFCs for “essential uses” from non-Article 5(1) countries.

A sufficiently progressive closure of Article 5(1) CFC production facilities will lead to the fact that CFC prices will gradually increase, thereby creating an incentive to convert to substitutes and/or to initiate recovery and recycle programmes, even if there would be continued production of certain BDN amounts in the non-Article 5(1) countries.

However, no price increase has been observed in the market in the years 1997-2000, and no price increase globally has been observed globally during 2000-2002, where it might have been possible that there has been a shortage in the supplies for Article 5(1) countries (and demand may have been covered from other sources). Subsequently, it may well be that there will be no shortage in the supplies during 2002-2004, if a number of Article 5(1) countries (the countries with no production agreements) would increase production levels compared to the year 2000.

In summary, many scenarios can be derived, however, the parameters that play a role during 2002-2005 are very complex and have a too high uncertainty. As a consequence, no reliable forecasts for CFC prices in the future can be made. Therefore, no increase in price has been assumed in this study for the 2003-2005 replenishment of the Multilateral Fund.

A4.2 Halon Production and Consumption

Halon production and consumption levels are addressed here, having regard to the halon production phase-out strategy in China (according to Executive Committee Decision 23/11).

Table A4-3 Halon production and consumption levels for all Article 5(1) Parties for the period 1994-2000 as reported to UNEP /UNEP98, UNEP02/ in ODP-tonnes. Consumption and production levels for China are given as reported to UNEP for 1994-2000, and also as prescribed for all years after 1997 in Decision 23/11 as taken by the 23rd Executive Committee meeting.

Year	Cons. all A 5(1) Parties	Cons. all A5 (1) without China	Cons. China	Production All A 5(1) Parties	Production China	Difference prod./ cons. in China
1994	31.09	10.94	20.15	21.94	(21.55)	(1.40)
1995	42.32	8.61	33.71	37.59	(37.35)	(3.64)
1996	40.75	7.63	33.11	40.57	(40.27)	(7.15)
1997	44.57	8.84	35.73	45.51	(45.19)	(9.47)
1998	30.74	8.53	22.21		(30.06)*	(5.58)*
1999	24.76	6.16	18.60		(24.09)*	(4.98)*
2000	20.17	5.39	14.78		(18.12)*	(4.38)*
2001	17.50	5.15	12.35*		(16.13)*	(3.78)*
2002	14.37	4.91	9.46*		(13.96)*	(4.50)*
2003	11.84	4.67	7.17*		(11.97)*	(4.80)*
2004	11.61	4.44	7.17*		(11.97)*	(4.80)*
2005	11.37	4.20	7.17*		(11.97)*	(4.80)*
2006	4.36	3.36	1.00*		(3.00)**	(2.00)**

* **Note:** These figures are given in the Executive Committee Decision on the Chinese halon sector phase-out strategy, and consist of both halon-1211 and -1301 data multiplied with the respective ODPs (3.0 and 10.0).

****Note:** As of 2006, the production of halon-1211 in China will be halted, according to the strategy.

Table A4-3 shows that, in 1994, the production was roughly 10,000 ODP-tonnes lower than halon consumption for Article 5(1) countries as a whole. Production in China was somewhat larger than consumption. The difference between consumption and production in 1994 may have been covered by exports from the Non-Article 5(1) countries. 1994 exports of roughly 10,000 ODP-tonnes not consumed in the Non-Article 5(1) countries in 1993 (derived from UNEP reported data) would for the larger part have resolved a possible shortage on the Article 5(1) countries' markets in 1994. This situation changed drastically after 1994 as China substantially increased halon production (note: the Republic of Korea has not been considered within this framework given that the 1993-2000 halon consumption reported to UNEP was offset by reported production).

Excess production of about 7,000 ODP-tonnes in China in 1996 rose to almost 10,000 ODP-tonnes in 1997. The excess production must have been exported to other Article 5(1) countries. In the years 1996 and 1997, all Article 5(1) countries, excluding China, consumed about 7,630 and 8,840

ODP-tonnes, respectively. The 1995-1998 baseline for all Article 5(1) countries, except China, is about 8,300 ODP-tonnes. These 1995-1998 consumption levels are included in the figures given in Table A4-3, and have been used to derive 2003-2006 data for countries other than China. The data are significantly different from the data published in the 1999 Task Force Report /RTF99/, i.e., the consumption in the year 1997 was 5,000 ODP-tonnes higher than assumed in the year 1999. The 1999 Replenishment Report /RTF99/ gave a forecast for the year 2000 consumption of all Article 5(1) countries minus China being 2,460 ODP-tonnes; however, the total value reported for the year 2000 amounts to 5,390 ODP-tonnes, a difference of about 3,000 ODP-tonnes. The above shows that halon projects, i.e., halon banking activities need adequate attention if the halon consumption should be further reduced in the near future.

With the manufacture of halons phased out in India (Decision 24/52 of the Executive Committee), China is the only important halon producer. In Table A4-3 the data present China's halon production and consumption figures for the period 1998-2006, as a total for both halon-1211 and halon-1301. Although consumption and production levels significantly decrease, particularly for halon-1211 in this timeframe, an excess production of about 4,000-6,000 ODP-tonnes is likely.

Year	Amount (US\$ million)	Triennium	Amount (US\$ million)
2000	4.5	2003-2005	14.1
2001	3.7		
2002	5.9		
2003	1.2	2003-2005	14.4
2004	1.8		
2005	11.4		
2006	0.4	2006-2008	0.8
2007	0.3		
2008	0.1		

Note: The amounts mentioned are given for the year following the year in the table above, however, they will be approved by the Executive Committee in the last meeting in the year before. Therefore the amounts are given in the table in this way.

Given that approximately 6,000 to 4,000 ODP-tonnes are consumed by other Article 5(1) countries in the period 1999-2005, the availability of Chinese halons for export is not expected to increase price levels nor to stimulate the domestic policies of other Article 5(1) countries during the coming years, particularly in relation to halon banking schemes. However, this Replenishment study has considered halon banking schemes, since these activities are eligible for funding under the Multilateral Fund.

Where it concerns the funding of the Chinese halon phase-out strategy, the following can be mentioned. For the years through 2008 (belonging to three three-year replenishment periods), the amounts as given above have been agreed upon and will be transferred to China, after definite approval by the Executive Committee (Decision 23/11).

A4.3 CTC Production and Consumption

CTC consumption will have to be reduced by 85% by the year 2005 (and by 100% in the year 2010). Since not many CTC projects have been considered before the year 2001, it implies that the larger portion has to be considered in this replenishment period (addressing the reduction by 2005 and steps towards the phase-out by 2010), since approvals of projects have to occur at least two years in advance due to the implementation lag).

CTC is rather unique because its main use is by large as a feedstock for the manufacture of CFCs (95% of all CTC uses). As such, it is not directly regulated by the Montreal Protocol, but its production follows that of its derivatives, CFC-11 and CFC-12.

CTC is currently manufactured in Article 5(1) countries including China, India, Korea, and Brazil. These countries manufactured in 1996 a total of 90,491 ODP-tonnes, according to UNEP figures. Despite this local manufacturing capacity, Article 5(1) countries are net importers of CTC. However, the figures reported to UNEP are not very consistent. The 1998 Aerosols Technical Options Committee (ATOC) report /ATOC98/ estimated that in 1996 Article 5(1) countries needed some 152,600 ODP-tonnes for CFC manufacture, thus a shortfall of more than 62,000 ODP-tonnes results when this number is compared to the production reported to UNEP (ATOC estimated a consumption of 1.35 ODP-tonnes of CTC to produce 1 ODP ton of CFC).

The UNEP data for production are about 26,000 ODP-tonnes in the year 1999 and 20,000 ODP-tonnes in the year 2000, if CTC production, which is probably used as feedstock is subtracted (the Republic of Korea has not been considered below).

The consumption of CTC, which is directly regulated by the Montreal Protocol, was estimated by ATOC in its 1998 report to be around 11,500 ODP-tonnes in 1995 and 1996. Review of the data reported to UNEP by Parties for this report yield consumption values of about 10,000 ODP-tonnes for 1995-1997. After a decrease in 1998, the consumption increased to almost 18,000 tonnes in 1999, after which it decreased to almost 15,000 tonnes in the year 2000. This implies that there is likely to be an excess production in the order of 6,000 ODP-tonnes.

The main use still is as 'process agent' which use was studied in 1997 by the Process Agent Task Force /PATF97/ and estimated at 7,000 ODP-tonnes for Article 5(1) countries. This use will probably have increased to 8,000 ODP-tonnes as the average value during 1998-2000 (baseline level). Process agent uses in Article 5(1) countries are eligible for funding by the Multilateral Fund.

It is difficult to extrapolate from the figures reported how much use is for process agents and how much is for solvent uses. Data reported by one Article 5(1) country give rise to the expectation that process agent use and solvent use may be much larger than expected. However, it is still reasonable to assume that 8,000 ODP-tonnes are used as process agents in uses approved by Decision X/14; the remainder could be for process agent uses not approved by Decision X/14. Informal figures /SEPA02/ yield that China consumes 3,000-3,500 ODP-tonnes annually for process agent uses approved by Decision X/14, and another 5,000-5,500 ODP-tonnes for uses not approved by Decision X/14. It is difficult to derive future scenarios on production and consumption, also in relation to process agent use, until audits have been completed which are ongoing in two large consuming countries (for CTC figures, compare also Table 2-1 where figures officially reported and the informal figures from China are included in brackets).

Continued availability of CTC as a feedstock for CFC will contribute to maintain the uses mentioned above. Consumption as a process agent is not necessarily emission; it could well be for an extension of the existing number of facilities. The unique nature of process agent uses makes it possible to circumvent phase-out if adequate emission controls are installed. However, it should be emphasised that it depends on the quality of the equipment and the degree of containment, whether cost effective emission controls can be considered for funding.

Taking into account the above mentioned uncertainties, and lacking further accurate data on the development of consumption patterns, the Replenishment Task Force considered it as premature to consider changes in CTC prices for this study on the 2003-2005 replenishment of the Multilateral Fund.

A4.4 TCA Production and Consumption

If one studies the TCA production data submitted by the developing countries during the years 1990-2000, it turns out that during the years 1990-1995 there has been one major producer in South America, which halted production in the year 1995. Production data are not reliable for the years 1995 and 1996, because certain countries reported negative production. After 1995, there is actually only one producer country (apart from small amounts produced in the Democratic Republic of Korea) amongst all Article 5(1) countries. Informal data discussed for this country for the year 2000 are not reliable, because they would imply a break in the trend so far.

Table A4-4 *Production and Consumption of TCA (ODP-tonnes) in Article 5(1) and Non-A5(1) countries for the years 1996-2000*

Year	1996	1997	1998	1999	2000
Production					
Non A5(1)	1,382.1	1,739.0	1,345.4	1,466.4	1,319.8
A5(1)	122.3	117.3	143.9	228.7	5.1
Total	1,504.4	1,856.3	1,489.3	1,695.1	1,324.9
Consumption					
A5(1)	1,613.8	1,412.0	1,408.3	1,283.1	1,297.9
Non A5(1)	0.5	275.5	-	241.2	288.5

Note: In the row presenting production values, the data for the year 2000 has not been taken into account for one Article 5(1) country, whilst in the consumption values the informally reported value for one country has been taken into account.

The table shows clearly that the majority of the TCA production is taking place in the developed countries, with an amount of 200-300 ODP-tonnes consumed in the developed for a variety of uses (essential uses, lab and analytical uses). The rest is all production for basic domestic needs of the Article 5(1) countries. When comparing total production with consumption in non Article 5(1) and Article 5(1) countries it is even so that there is a small imbalance; it could well be that the consumption in all Article 5(1) countries is somewhat higher than reported to UNEP. If the BDN production continues as such, there is no reason to assume a cost price increase for TCA in the near future. Only if the BDN production would be seriously restricted, while at the same time reducing the consumption in Article 5(1) countries, there may be a reason to assume changes in cost price.

TCA consumption in the Article 5(1) countries was about 1,600 ODP-tonnes in 1995-1996, about 1,400 tonnes in 1997-1998 and about 1,300 tonnes in 1999-2000. It is difficult to derive a consumption pattern from these data, however it will be certain that there is an annual decrease. The TCA consumption is scheduled to be reduced by 30% by the year 2005 and by 70% by the year 2010 (this implies reductions during the period 2005-2010 if one assumes a linear decrease). Projects in the triennium 2003-2005 have to address a certain period beyond 2005 due to the implementation lag. Where the baseline value for all Article 5(1) countries is 1329 ODP-tonnes, 580 ODP-tonnes would have to be addressed in projects if one would depart from the year 2000 consumption.

However, the sectoral solvent phase-out plan for China considers 621 ODP-tonnes for a phase-out starting in the year 2000 (with consumption of 254 ODP-tonnes by 2007). And, furthermore the consumption of Malaysia and Thailand does not have to be taken into account, because it is being addressed in national terminal phase-out plans. Values for consumption for the

remaining countries are then 543.2, 514.4 and 380.0 ODP-tonnes for the years 1998, 1999 and 2000, respectively; this yields a baseline of 479.2 ODP-tonnes. The consumption in the year 2007 (following implementation of projects approved in 2004-2005) is estimated to be 259 ODP-tonnes. It is difficult to estimate the consumption values for the years 2001 and 2002 but they are likely to be in the order of 400-420 ODP-tonnes. This would imply that 160 ODP-tonnes have to be addressed in projects.

Taking into account the above, as well as the differences between the values reported for production versus consumption, there is not enough material available to derive a scenario for the development of the TCA price in the Article 5(1) countries, neither is it possible to derive a reasonable forecast for the development of the consumption pattern during 2001-2003. Once more information becomes available, particularly also from regional audits, a more precise forecast can be given. No changes in the TCA cost price have been assumed in this report.

Annex 5: Methodology Applied for Estimating the Funding Required

A5.1 Methodology Applied

As a first step, the model calculates the reduction in consumption resulting from the ODP-tonnes phased out by investment projects. The distribution of the CFCs phased out year-by-year due to project implementation (i.e., the implementation lag) is based upon knowledge obtained from Multilateral Fund Secretariat data /MFS02/. In the model, the cumulative amount of CFCs that is phased out by the implementation of an individual project is independent of the assumed implementation lag.

In the next step, the model makes a best fit to the country consumption data reported to UNEP for the years 1994-2000. This is done by calculating the consumption pattern from year to year, applying a growth (or decrease) percentages for certain periods until the year 2000 and subtracting the ODP-tonnes reduced due to project implementation in that same year. For a next year in the calculation the growth percentage is applied to the remaining CFC consumption; the reduction in ODP-tonnes due to project implementation is again subtracted. This is considered to be the most realistic procedure (in almost all country cases the growth percentages considered were different for the period 1994-1995, for 1995-1997 and for 1997-1999/2000). The different growth percentages are adjusted manually in the spreadsheet programme until a best fit has been found to the data reported to UNEP /UNEP02/ for up to and including the year 2000, for the separate countries.

After the year 2000 the model assumes 0% growth, or rather, 0% influence on the CFC consumption level from other effects than just project implementation. The influence of projects approved through the year 2001 and expected to be approved in the year 2002 is then determined. It results in a CFC consumption curve, which decreases and then gradually stabilises (dependent on the lag in project implementation) since no project implementation occurs after a certain year (assumed here: 2002).

A country is considered to be in compliance with the Protocol if its ODS consumption is equal to or lower than the consumption levels that are predetermined once the control schedules and the baseline or the freeze level of the consumption is known. The values for the control schedule for CFCs, as applied in the model, are determined as follows:

- the maximum level of consumption that complies with the 1999/2000 freeze is calculated as the average level of consumption over the three year period 1995-97;
- the scheduled 50% reduction in the maximum consumption that is allowed for the reporting period 1 January 2005 to 1 January 2006, is calculated on the assumption that the annual reductions from the freeze

level will follow a step-wise linear function in terms of percentages of the freeze level.

This calculation yields the following consumption levels following reduction steps applied for consumption in terms of percentages of the Baseline (freeze) level:

Year	Reduction from Baseline	Year	Reduction from Baseline
2000	95.45%	2004	59.09%
2001	86.36%	2005	50.00%
2002	77.27%	2006	32.50%
2003	68.18%	2007	15.00%

Whether or not a country reports a consumption level higher or lower than the freeze is not important for the calculation, i.e., the model does not conclude non-compliance after which specific actions are taken. It is simply so that the model calculates the effect of project approvals (through the year 2002) on the consumption after the year 2000.

Actually, from the curve obtained the model calculates the project approvals required to meet the step-wise linear reductions of consumption that enable compliance with the 50% and 85% reduction which is mandated for CFCs for the years 2005 and 2007, respectively.

By applying the assumed implementation lag, the model calculates the project approvals required year-by-year to ensure that the “target” amount of ODS is phased out by the reporting period 2005-2007. This is done by calculating whether or not in a certain year the consumption will be higher than following the linear reduction schedule; if this is the case the difference is determined and a project approval is assumed at the appropriate time in advance. The size of this anticipation period is determined by the implementation lag function (see below). This is applied in a stepwise way, year by year, where, for all years, the effects of project approvals from earlier years are taken into account.

Automatically, the computer programme determines how many ODP-tonnes need to be approved in the year 2003 to impact on the consumption pattern of all Article 5(1) countries, beginning in the year 2005. The same is done for the years 2004 and 2005. Approvals during the year 2003 will have a certain effect on the consumption during 2005, but will also have a certain effect on the consumption in the years 2006, 2007 and 2008 which depends on the implementation lag function.

If, during the period 2000-2002, more projects have been approved than are strictly necessary to comply with the control schedule, the ODP-tonnes to be approved in projects during 2003-2005 will be that much less. If more

projects than necessary have been approved this could have been caused by lower consumption levels than anticipated in the Replenishment Study 2000-2002; it could also be due to a different mix of activities under the Multilateral Fund than assumed in the study.

However, this effect will not be very important. This is due to the fact that during the 2003-2005 (replenishment) period projects will have to be approved to ensure compliance (50% reduction) in the year 2005 and in the year 2007, when an extra 35% CFC consumption reduction is required. It means a sharp reduction in two years (from 50 to 15% between 2005 and 2007), which is a higher rate of reduction than is applicable in the years 2000-2005. Since it is assumed that projects start to be implemented after 2 years (see below) the extra 35% reduction needs to be “approved” (via projects) in the replenishment period 2003-2005.

In fact, the model is more or less used in the way, which is described in “Option 2” in Decision 35/57 of the 35th Executive Committee meeting. It starts from the historic (reported) 2000 consumption, and subtracts the value of projects approved but not implemented. The only --major-- difference is that there is time dependent function, which is not considered in the lumped determination of the remaining consumption eligible for funding according to “Option 2”. This is due to the fact that the model needs to precisely determine the funding required during the replenishment period concerned (only) and not the total remaining consumption eligible for funding. In fact, in case countries have increased their consumption after 1997 (data for 2000 may still show compliance or not) the increase in consumption will be addressed in projects.

What has been described in “Option 1” in the relevant Decision is slightly different. In this case only the baseline consumption is considered (the 1995-1997 consumption) from which the projects approved since a certain date are subtracted. It implies that this method of determining the remaining eligible consumption does not take into account the consumption reported for 1998-2000. In case a country would have decreased consumption due to other reasons than project implementation, this decrease is still contained in the value “remaining eligible consumption”. In determining the funding requirement the Task Force has not further dealt with this procedure.

The calculation method described above (using the data reported through the year 2000) has been applied to all countries with a consumption larger than 1000 ODP-tonnes. However, since agreements for a phase-out (with prescribed amounts for ODP consumption and funds to be made available) exist for a number of countries, a calculation was not required here.

A5.2 ODS Consumption 1994-2000

The historic consumption data used by the Task Force for this study were the Article 5(1) country data reports submitted to UNEP for the years 1994-2000 /UNEP02/. The data were submitted for each of the substances listed in Annex A, Groups I and II, Annex B, Groups I, II and III, and for Annex E. The data reported for 1994-1995 formed the starting point for the calculations for most of the substances mentioned above. In the case of methyl bromide, data reported for later years formed the starting point for the calculations.

Not all Parties have reported their consumption of controlled substances as is required by the Protocol. In the absence of official data, the Task Force estimated the missing ODS consumption data by extrapolation. However, virtually all data were submitted for the year 1999, for the year 2000 only some data were missing, mostly for the countries in category 3. Since the data are much smaller in categories 4 and 5, some extrapolation was done to derive the estimated 2000 consumption. To the total consumption values for the different categories uncertainties of 3% can be attached, whereas the total consumption value should have an uncertainty of less than 2%.

The percentage compositions by ODS of the consumption of Annex A and B substances, respectively, as derived from the country data reported to UNEP, were checked against the percentages given in the "Progress Reports on Implementation of Country Programmes". In the case of minor differences, the data reported in the Country Programmes were used in this study. On the whole, these data were reasonably consistent. Data regarding distributions across sectors using Annex A, Group I substances (CFCs) were obtained from the "Progress Reports on Implementation of Country Programmes". This procedure allowed the Task Force to attribute specific numbers of ODP-tonnes of consumption to specific sectors in a given country. This was necessary given that the number of ODP-tonnes to be phased out by investment projects and the phase-out costs are both sector-specific.

In some cases, project approvals focussed on certain sectors, which were described as substantially smaller in the Progress Reports on Implementation of Country Programmes (sector percentages). In that case, modest changes to the sector percentages had to be made to avoid the calculation of negative consumption values. The above underscores the fact that a country's consumption data will often not incorporate all ODS consumers; this may be different from year to year, i.e. with growing knowledge at the country level the reported consumption may increase although actual consumption has not increased. There is no method to take this into proper account. A revision of country data has been carried out by several countries over the period 1996-1999; in fact, a revision normally means that data are "revised" in the upward direction.

A5.3 Factors Applied: Implementation Lag

The period between project approval and project implementation and completion (i.e., ODP-tonnes phased out), can range from about 1.5 to maximum 6 years. Given the implementation time lag for projects approved during 1993-99, much of the ODS phase-out will have taken place during 1996-2002; for the projects approved during the period 2000-2002 most of the ODS phase-out will take place after 2002. Only approvals done during the year 2000 may have a certain impact on the country's consumption in the year 2002 (two years after approval).

The Task Force estimated the effect that the implementation lag will have on the timing for project approvals required to achieve the reduction steps in the consumption of the substances listed in Annex A, Group I, CFCs. The historical data on implementation lags were analysed from data on approvals and implementation that are recorded in the regularly up-dated database maintained by the Multilateral Fund Secretariat /IAP02/.

Using this information in the light of consultations with the Secretariat and the Implementing Agencies, an average implementation time lag was determined. The implementation lag summarises information on how much, in percentage terms, of the targeted ODP phase-out through project implementation takes place, year-by-year, until full implementation has been achieved.

The Task Force assumed that the implementation lag valid for the 1993-1995 approvals could be slightly improved (this was already mentioned in the 1997-1999 Replenishment Study) for the years 1996 and thereafter. No further improvements are assumed to have occurred during 1997-2002, and this is also assumed to remain so for projects approved during the replenishment period 2003-2005.

Table A5-1 Percentage project implementation in years after project approval (cumulative distribution for the distributed time lag)

Project Implementation	Schedule 1993/1996 (cumulative values)	Schedule 1996/2002 (cumulative values)
Within 1 year	0%	0%
Within 2 years	55%	60%
Within 3 years	70%	85%
Within 4 years	80%	95%
Within 5 years	90%	100%
Within 6 years	100%	-

This implies:

- after 2 years: 60% implemented (instead of 55%, as for the 1993-95 approvals); and
- after 3 years: 85% implemented (instead of 70%, as for 1993-1995 approvals); and
- after 4 years: 95% implemented (instead of 80%, as for 1993-1995 approvals).

The implementation lags assumed for projects approved during 1993-96 and after 1996 (1996-2002), respectively, are presented in Table A5-1.

Given these implementation lags, it is possible to calculate the ODP-tonnes that must be approved in the 2003-2005 period for reduction steps per year per country (or per Country Category) in the year 2005 and beyond. For the replenishment period 2003-2005 it is for a large part targeted at achieving the 85% reduction in CFC consumption by 1 January 2007.

A5.4 Factors Applied: Domestic Policies of Article 5(1) Countries

In earlier replenishment reports, it has been mentioned that domestic policies in Article 5(1) countries can have a substantial influence on the estimated funding requirement. It was thought that Parties with well crafted and effectively implemented domestic policies to create, or reinforce, market incentives to encourage enterprises to phase out ODS would be more successful than others.

It can be shown in tables that actually these policies have not been very effective, if they were existent (see tables in Annex 2, in particular Table A2.7).

The new policy of the Multilateral Fund is to link non-investment projects to the phase-out in order to meet compliance needs. In this way one can more easily quantify the effect of non-investment activities on the reduction in ODS consumption. With the importance of non-investment projects growing, particularly when there are no large consumption investment projects left, it is in fact the institutional strengthening and Refrigerant Management Plans that are assumed to decrease the consumption in a less direct manner. The decision by the Executive Committee (Decision 35/57) has been to reduce the calculated funding requirement. This by (an amount in US\$ calculated from) the amount in ODP-tonnes that has been determined for (non-LVC) non-investment activities using the “conversion” of US\$12.1/ODP-kg.

Rather than elaborating on domestic policies, it should be mentioned that countries have shown (negative or positive) growth percentages in their consumption during 1999-2000. The minimum and maximum for these growth percentages are substantial. The largest minimum values that can be calculated for the different country categories vary between –20 and –60% (in

one year). The largest maximum values, i.e., for consumption growth, vary from +15 to +50% in the different country categories. These values are not valid for all countries; it may concern one or two countries in one country category. The values mentioned above do not involve project implementation. It simply concerns the values for ODS consumption reported to UNEP's Ozone Secretariat.

A5.5 Factors Applied: Cost-effectiveness

In the past, cost-effectiveness thresholds were agreed by the Executive Committee in order to be able to take decisions on project approvals. There was also decided an exemption for the low volume consuming countries (LVCs). For the calculations made for the replenishment period 2003-2005, no LVCs have been studied. It also implies that there has been no application of their cost effectiveness values in the model.

One could apply the same cost-effectiveness values to all countries for all years for all projects. This was not done in earlier replenishment studies, and it has also not been done in the 2003-2005 replenishment study. Cost effectiveness values vary from country type to country type, and less from year to year.

In making calculations, the average cost effectiveness value for a sector for countries in a certain category was determined from the separate values for all projects approved in the years 1998, 1999, 2000 and 2001. These values are given in table A5-2.

Table A5-2 Cost-effectiveness threshold values and cost-effectiveness values applied in this study (US\$/kg ODP) for the three country categories that are no LVCs (the cost effectiveness threshold for refrigeration is the average for commercial and domestic; this is the reason that the cost effectiveness used can be larger than 100%); values are derived from approved projects during the period 1998-2001.

Country	CE Threshold	Category 1	Category 2	Category 3	LVC (4&5)
Sector					
Aerosols	4.40	2.93 (67%)	3.71 (84%)	3.82 (87%)	Not
Foams	9.53	6.30 (66%)	6.39 (67%)	5.46 (57%)	applied
Refrigeration	14.48	13.10 (90%)	14.95 (103%)	16.38 (113%)	
Solvent 113	19.73	16.00 (81%)	19.59 (99%)	-----	
Solvent TCA	38.50	19.25 (50%)	19.25 (50%)	-----	
Solvent CTC	-----				

The cost effectiveness values given in the table are the ones applied in the mathematical analysis of the funding requirement for the countries in the categories 1,2 and 3.

In comparison with recovery and recycle projects, in relation to servicing, it should be stated that one finds cost effectiveness values between US\$9 and 22, dependent on the type and size of the country, and especially in relation to the infrastructure that exists. The average cost effectiveness of these RMP type (R&R) of projects for non-LVC countries is in the range US\$ 8.5-9.5. This value has therefore been considered in adjusting the calculations following the "historic approach" in chapter 4. However, it should also be mentioned that the cost effectiveness in National Phase-out Plans consists of more than just the recover and recycle component and it can therefore be lower.

Annex 6: Funding Requirement for the MB sector; Method of Analysis and Results Obtained

A6.1 Introduction

A6.1.1. Method of Analysis

The analysis for the MB sector was made on a country-by-country basis. A database was made for all approved MB investment (phase-out) projects, listing the tonnage due to be phased out per year, and funding tranches allocated per year, according to the information given in the project agreements in reports of ExCom meetings. This database was used for calculating the MB reductions and funding in the period 2003-05 for approved projects. It was also used for calculating the average cost-effectiveness values.

A second database was made, listing the national MB consumption of individual Article 5(1) countries, as reported by the Ozone Secretariat for 1999 and 2000, as well as the baselines calculated by the Ozone Secretariat (i.e., the average for 1995-98, excluding QPS). This database was used to calculate, country by country, the amount of MB that needs to be eliminated to meet the freeze in 2002 and 20% cut in 2005. For example, calculation of the freeze reduction entailed subtracting the baseline from recent consumption, for each country. The Ozone Secretariat data for 2000 was used primarily for these calculations, but in cases where 2000 data was not available, Ozone Secretariat data for 1999 was used instead. The exception was China, where SEPA was asked for data for 2000 because it might have had a significant impact on total MB consumption, but it was found there was probably less than 82 ODP-tonnes difference between consumption in 1999 and 2000 in China. For countries which are implementing MB investment projects, the consumption database was amended to reflect the MB reductions scheduled in the project.

The database of Ozone Secretariat data was also used to calculate the total MB that remains to be phased out. But for the 21 countries that have approved investment projects, the 'starting' consumption was taken as the starting consumption in the individual project agreements of ExCom, because this would be more consistent with other parts of the analysis.

The analysis used data from three main sources:

- MB consumption data provided by the Ozone Secretariat, reported by Parties under Article 7 of the Protocol. Primarily this was data for 2000 and Baselines calculated by the Ozone Secretariat. For countries where 2000 data was not available, the data from 1999 was used.

- Reports of the Executive Committee of the Multilateral Fund, which specify conditions and agreements for approved MB investment (phase-out) projects. These normally state the annual MB reductions to be achieved by projects, the amount of MB remaining at the end of projects, and the funding disbursements per year.
- Multilateral Fund Business Plan for 2002, dated March 2002. The Plan lists new MB investment projects proposed for approval during 2002, and often lists the MB tonnage they are expected to eliminate.

The quantity of MB that needs to be addressed in the next replenishment period was calculated as the sum of the following items:

- a) Approved MB investment (phase-out) projects: the quantity of MB scheduled for phase-out in approved investment projects in the period 2003-05, and related funding tranches specified in ExCom reports;
- b) MB reductions necessary to meet the freeze: for each country, the Ozone Secretariat data was used to calculate the amount of MB to be eliminated to meet the freeze, taking full account of approved investment projects and proposed new investment projects due for approval in 2002 (in the MLF Business Plan);
- c) MB reductions necessary to meet the 20% reduction step required by the Montreal Protocol in 2005: for each country, the Ozone Secretariat data was used to calculate the amount of MB to be eliminated to achieve a 20% cut. Full account was taken of approved investment projects, and proposed new projects for 2002 in the MLF Business Plan. For the analysis, it was assumed that countries that have not yet ratified the Copenhagen Amendment will ratify during the next replenishment period (refer to discussion on Copenhagen Amendment in section 1.2 below);
- d) Anticipated MB reductions due to time-lag: there is normally a 0-2 year time lag between project funding and initial MB reductions achieved by projects. The analysis therefore made the assumption that some of the funds approved in 2003-05 will not yield MB reductions for up to 2 years after 2005.

Having calculated the quantity of MB that needs to be eliminated in the replenishment period, the analysis then calculated the funding requirement as follows: The cost-effectiveness (US\$ per ODP-kg) of all approved MB investment projects were determined, using the project ODP tonnages and costs listed in reports of ExCom meetings. It was noted that the distribution of values was not a normal distribution, so the geometric mean would be more representative than the arithmetic mean. The replenishment was then estimated by multiplying the geometric mean (average) cost-effectiveness of

approved projects by the MB tonnage that needs to be eliminated by the next replenishment period. The cost analysis was made on the basis of the current official ODP of 0.6. If this is changed in future, the replenishment would need to be adjusted proportionately because the incremental costs of MB alternatives equipment, materials and training will remain the same, irrespective of changes in ODP values.

The average cost effectiveness value for MB phase-out calculated on the basis of historical costs of investment projects, US\$18.0 per ODP-kg, was similar to that found on the basis of the questionnaire (see Appendix).

It should be noted that this analysis was based primarily on the Ozone Secretariat data for 2000, because sufficient data for 2001 is not yet available, so the analysis may have under-estimated the quantity of MB that needs to be reduced to meet the freeze in certain countries. In the case of a country in Central America, for example, the NOU recorded consumption of 921 ODP-tonnes in 2001 in a recent survey conducted by MBTOC; this is 54 ODP-tonnes higher than the reported data for 2000, indicating that this country needs to make greater MB reductions to meet the freeze than was assumed in the analysis above. Similarly, a CEIT country recently carried out detailed surveys and identified MB consumption in 1995-2000 which has not yet been reported to the Ozone Secretariat; previously their consumption was assumed to be zero. Cases such as this mean that the analysis has probably underestimated the actual amount of MB that needs to be eliminated to meet the freeze. The same point applies to the analysis of the 20% reduction step described in section A6.2.5 below.

Analysis was carried out as above although, under Decision IX/5, the Parties are due (in the light of the assessment by the Technology and Economic Assessment Panel) to review the Article 5(1) MB reduction schedule in 2003. It is not feasible to make realistic predictions of the outcome of future discussions of the Parties. Quarantine and pre-shipment (QPS) uses of MB were also excluded from all calculations in this report because QPS is not controlled by the Montreal Protocol.

A6.1.2 The Copenhagen Amendment

Ratification of the Copenhagen Amendment is necessary for countries to be eligible for MLF assistance for MB investment projects. By mid-February 2002, about 102 Article 5 countries had ratified the Copenhagen Amendment of the Montreal Protocol, and about 36 Article 5 countries had not ratified. So the majority of countries that use MB have already ratified the Copenhagen Amendment. Only 11 of the 36 or so countries that have not ratified have some MB consumption reported: Bosnia and Herzegovina, China, India, Ethiopia, Kyrgyzstan, Libya, Malta, Namibia, Papua New Guinea, Swaziland and Zambia. Most of these countries consume modest amounts of MB for

non-QPS purposes (less than 60 ODP-tonnes per annum), with the exception of China, which consumes substantial amounts. However, a high-level Chinese official has written to the Ozone Secretariat, on behalf of the Chinese government, to say that China intends to ratify within 12 months of December 2001, i.e., before the end of 2002. This was also stated in a response to the questionnaire investigation conducted as part of the background to this report (see Appendix). China is also preparing a strategy for addressing MB. Bosnia and Herzegovina and Namibia have requested future MB projects noted in recent MLF Business Plan documents. For the purpose of making the calculations, the analysis assumed that these 11 MB-consuming countries will ratify the Copenhagen Amendment and be eligible for projects in the next triennium.

A6.2 Calculation of Quantity of MB to Be Eliminated

A6.2.1 Total Amount of MB

The total amount of MB to be phased out was calculated from the Ozone Secretariat data and the ExCom reports on approved MB investment projects. A country-by-country database was created from the Ozone Secretariat consumption data for 2000. For countries where 2000 data was not available, we used the Ozone Secretariat data for 1999. For countries where no data was available for 2000 or 1999, it was assumed that MB consumption was zero, although it is recognised that this leads to an under-estimation of the total Article 5(1) consumption.

For the 21 countries that have MB investment projects, the consumption was taken from the project agreements (the ‘starting’ consumption in individual project agreements made by the ExCom); in some cases the “starting” consumption was for 1998 or 1999. This means that the estimate for the total MB consumption does not relate to the year 2000 specifically. It was felt appropriate to use this approach to remain consistent with the consumption and funding / disbursement calculations in other sections of the MB analysis, particularly in sections, which calculate the scheduled impact of approved projects.

On this basis, the analysis gave a total of at least 9,791 ODP-tonnes for MB consumption in Article 5(1) countries (excluding QPS). This figure was used as a basis for calculations, although it was recognised that the true figure may exceed 10,000 ODP-tonnes.

A6.2.2 Approved Investment Projects

By April 2002, the Executive Committee of the Multilateral Fund had approved 27 MB investment (phase-out) projects in 21 countries. These projects normally include training in the use of alternatives, procurement and

installation of alternative equipment and materials, and policy development. The projects phase out either major uses of MB (e.g. tobacco; strawberry and tomato; grain) or all uses (excluding quarantine and pre-shipment).

The MB phase-out dates in projects vary from 2002 to about 2007, as specified in the conditions that ExCom sets for approved MB projects. The dates generally depend on the project approval date, MB uses, tonnage to be eliminated, and national policies.

The quantity of MB scheduled to be phased out by approved investment projects is 3,111 ODP-tonnes. Funds from the current and past replenishment periods (1998-2002) are scheduled to eliminate 914 ODP-tonnes of MB by the end of 2002, and 789 ODP-tonnes in future years (Table A6-1). However, eight of the investment projects are funded in tranches that come partly from future replenishment periods; these projects are due to phase-out 1,351 ODP-tonnes from funds in the replenishment period 2003-05 and 57 ODP-tonnes from funds after 2005 (Table A6-1).

If the MB scheduled to be phased out in the period 1999-2002 (914 ODP-tonnes) is deducted from the total MB consumption in Article 5(1) countries (9791 ODP-tonnes), the remaining MB is at least 8,877 ODP-tonnes (i.e., 9,791 minus 914).

Table A6-1 MB scheduled for phase-out in approved investment projects, categorised by replenishment period

<i>Replenishment period</i>	<i>Scheduled MB reductions (ODP-tonnes)</i>			<i>Total per replenishment period</i>
	<i>1999-2002</i>	<i>2003-2005</i>	<i>2006-2007</i>	
Funded in 1998-2002	914	738	51	1,703
Funded 2003-2005	0	899	452	1,351
Funded 2006	0	0	57	57
Total ODP-tonnes	914	1,637	560	3,111

Source: Compiled from project agreements and reports of ExCom meetings

A6.2.3 Proposed Projects for 2002

The Business Plan of the Multilateral Fund lists a number of potential new MB investment (phase-out) projects that are expected to be approved during 2002. An estimate of the MB reductions was made using the MLF estimates for 2002 and future years. In cases where the Business Plan did not state the MB reductions, estimates were made from national Ozone Secretariat data. In some cases the Business Plan tonnage estimates were adjusted to better match the Ozone Secretariat data and existing projects. This analysis was made on a

country-by-country basis. However, the analysis ignored investment projects in the contingency list of the Business Plan, and all non-investment projects.

On this basis, it was estimated that MB reductions of approximately 933 ODP-tonnes are due to be funded by the current replenishment, while reductions of approx. 968 ODP-t are due to be funded in tranches in the 2003-05 replenishment period (Table A6-2).

Table A6-2 Estimated MB reductions from planned new investment projects for 2002 in MLF Business Plan

<i>Estimated replenishment period</i>	<i>Estimated MB reductions (ODP-tonnes)</i>			<i>Total per replenishment period</i>
	<i>2002</i>	<i>2003-2005</i>	<i>After 2005</i>	
Funded in 2002	500	225	208	933
Funded in 2003-2005	0	968	0	968

Source: Estimates calculated from data in MLF Business Plan adjusted in line with database of Ozone Secretariat consumption and existing projects.

A6.2.4 Reductions to Meet the Freeze

The Montreal Protocol requires Article 5(1) countries to freeze consumption of MB in 2002 at the Baseline level (average for 1995-98). The database of country data described in section A6.2.1 was used to calculate, for each individual country, the necessary MB reductions to meet the freeze. The database took full account of the MB reductions that are already scheduled to be made by the end of 2002 in 21 countries which are implementing approved MB investment projects (914 ODP-tonnes, section A6.2.2).

The analysis found that countries, which do not have MB investment projects need to reduce MB consumption by 1,463 ODP-tonnes to meet the freeze. The planned new investment projects for 2002 (section A6.2.3) will eliminate approximately 339 ODP-tonnes to help meet the freeze, when analysed on a country-by-country basis, so this amount needs to be deducted. This means it will be necessary to eliminate 1,124 ODP-tonnes (i.e. 1,463 minus 339) in the 2003-05 replenishment period to freeze MB consumption. However, if some of the planned new projects for 2002 are not actually approved this year, the relevant MB reductions will need to be carried forward and added to the requirements for funding in the 2003-05 replenishment period.

TEAP notes with concern that the analysis indicates that a number of Article 5(1) Parties may not be able to achieve the freeze during 2002, and that the list of new MB investment projects planned for 2002 does not appear to address fully the need for Parties to comply with the freeze.

This consumption analysis was based primarily on the Ozone Secretariat data for 2000, so the analysis may have underestimated the quantity of MB that needs to be reduced to meet the freeze in certain countries, as described in section A6.1.1.

A6.2.5 The 20% Reduction Step in 2005

The Montreal Protocol requires Article 5(1) countries to reduce MB consumption to 80% of the Baseline level in 2005. The situation of the 21 countries that already have approved investment projects was analysed in section A6.2.2; their scheduled reductions will achieve or exceed the 20% reduction at national level (Table A6-1).

TEAP's database of Ozone Secretariat data, described in section A6.2.1, was used to calculate the tonnes of MB that each individual country needs to eliminate to achieve the 20% cut for countries that do not yet have projects. The country-by-country analysis showed that it will be necessary to eliminate at least 610 ODP-tonnes to achieve the 20% reduction step. Assuming that the proposed projects in the MLF Business Plan will be approved in 2002, country-by-country analysis shows that it would enable certain countries to achieve the 20% cut in the 2003-05 period, eliminating 224 ODP-tonnes of the 610 ODP-tonnes identified above. So the amount of 610 ODP-tonnes can be adjusted to 386 ODP-tonnes (i.e., 610 minus 224) necessary MB reductions to achieve the 20% cut in 2003-05.

A6.2.6 Other MB Reductions in This Replenishment Period

After funding the specific MB reductions listed in sections A6.2.1- A6.2.5, the remaining MB consumption is estimated to be more than 3,326 ODP-tonnes (Table A6-3).

Table A6- 3 Calculation of remaining MB

	<i>MB reductions funded by replenishments of 1998-2005</i>	<i>Sub-total MB reductions</i>	<i>Remaining MB (after deducting MB reductions)</i>
<i>Starting consumption</i>	-	-	9,791
Approved projects	1,703 + 1,351	3,054	6,737
Proposed projects	933 + 968 (including 339 for freeze and 224 for 20% reduction)	1,901	4,836
Freeze	1,463 minus 339	1,124	3,712
20% reduction step	610 minus 224	386	3,326
Remaining MB			3,326

In ODS projects there is often a time lag before ODS reductions are achieved by the projects. Experience of existing MB investment projects shows a time lag of 0-2 years between project approval and first MB reductions, and a time lag of 2-6 years between approval and final MB reductions. So the replenishment period of 2003-05 will necessarily cover some MB reductions after 2005.

As for other ODS sectors, a linear phase-out (reduction) of MB was assumed between the 20% reduction step in 2005 and the phase-out date of January 2015. This would mean an average reduction rate of 8% per annum from 80% of the baseline (this analysis took no account of the fact that Parties are due to review the Article 5(1) MB reduction schedule in 2003, because it was not feasible to predict the outcome of the Parties' discussions). The calculation was not based on a lumped analysis of the total Article 5(1) baseline (about 9,227 ODP-tonnes) but on the estimated MB remaining after 2005 (3326 ODP-tonnes), because this would give a more realistic picture. So it was estimated that 532 ODP-tonnes of the remaining MB (i.e., 2 years times 8% of 3,326 ODP-tonnes) will need to be funded in the next triennium. However, the approved investment projects are scheduled to eliminate 57 ODP-tonnes of MB in the 2006-8 triennium (Table A6-1), so this quantity is deducted, leaving an adjusted figure of 475 ODP-tonnes (i.e., 532 minus 57) to be funded in the 2003-05 triennium to account for the time-lag and to keep up the momentum of phase-out.

A.6.2.7 Summary of MB reductions to be funded in 2003-05 triennium

Table A6-4 below provides a summary of the MB reductions that need to be funded in the next replenishment period. The total is 4,304 ODP-tonnes.

Table A6-4 Summary of necessary MB reductions in the next replenishment period

MB phase-out activities funded in 2003-05	MB tonnage (ODP-tonnes)
Reductions in 2003-05 scheduled by approved MB investment projects	1,351
Reductions in 2003-05 in proposed MB investment projects planned for approval during 2002 (including at least 563 ODP-t necessary for the freeze and 20% cut)	968
Reductions to freeze MB consumption (after 2002), after deducting existing and proposed projects	1,124
Reductions to meet 20% cut in 2005, after deducting existing and proposed projects	386
Reductions due to time-lag between funding and actual MB reductions	475
Total	4,304

A6.3 Cost Analysis in the MB Sector

A6.3.1 Funds for Approved Investment Projects

Some of the approved MB investment (phase-out) projects are funded in annual tranches, over a period of about 2 to 5 years. The anticipated funds are cited in project agreements made between ExCom and the government concerned. For this analysis, TEAP mapped out the schedule of funds for all approved projects by year, according to the tranches and disbursements specified in the project agreements and reports of ExCom.

The analysis provided the totals given in Table A6-5 below, for the MB investment projects approved by April 2002. The funds scheduled for approved MB projects in the years 2003-2005 are US\$11,725,917.

Table A6-5 Funds scheduled by MLF for approved MB investment projects, 2003-2007

<i>Funding period</i>	<i>Scheduled funding (US\$)</i>
2003 – 2005	11,725,917
2006 – 2007	467,000

Source: Compiled from data in project agreements and reports of ExCom.

A6.3.2 Cost-effectiveness Values of Approved Projects

TEAP analysed the cost-effectiveness values of MB investment projects approved by the Executive Committee of the Multilateral Fund (as of February 2002). The arithmetic mean is US\$22.8 per ODP-kg. However, the distribution of values is not a statistically normal distribution, so it is more appropriate to use the geometric mean, which is US\$18.0 per ODP-kg.

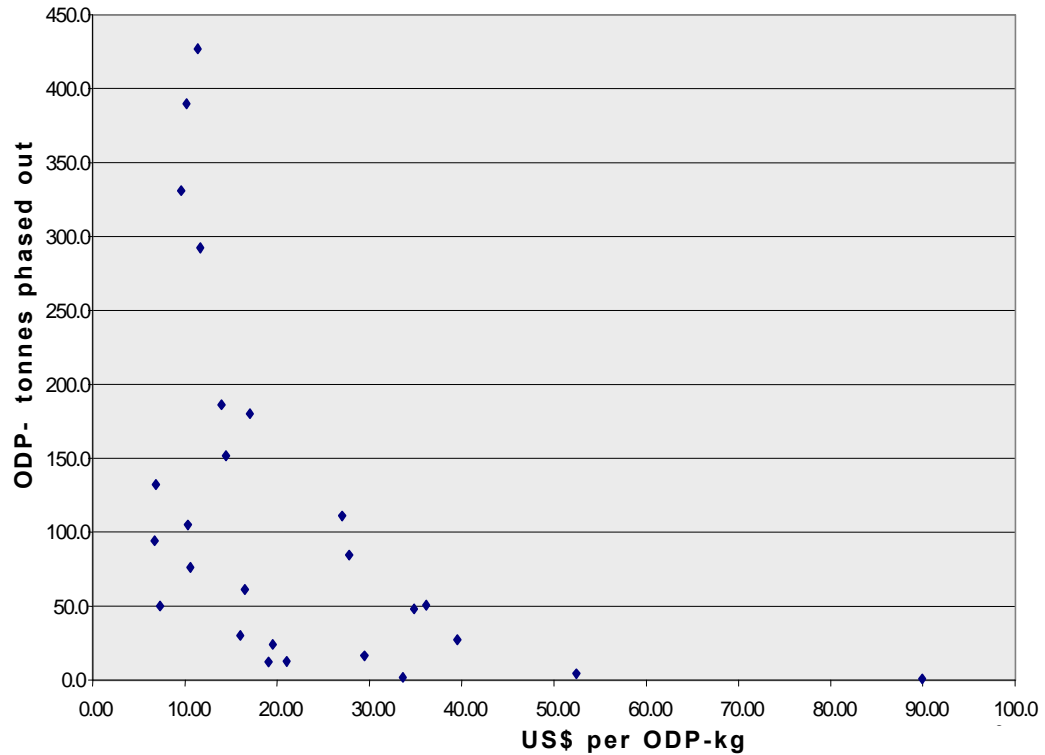


Fig. A6-1 Cost effectiveness values and ODP tonnes phased out by project

A6.3.3 Estimated Replenishment Needs

The total MB to be eliminated by funds in the next triennium is estimated to be 4,304 ODP-tonnes.

Assuming the cost-effectiveness value of US\$18.0 per ODP-kg, the total funds estimated for the next triennium would be US\$ 64,879,917 (Table A6-6). To this amount agency support costs at 11% apply.

Table A6-6 Required MB reductions and cost estimates based on the CE geometric mean

<i>MB phase-out activities (as in Table 4)</i>	<i>MB reductions (ODP-tonnes)</i>	<i>Cost-effectiveness value (\$ per ODP-kg)</i>	<i>Estimated replenishment in 2003-05 (US\$)</i>
Approved investment projects	1,351	-	11,725,917
Proposed investment projects	968	18	17,424,000
Freeze	1,124	18	20,232,000
20% cut	386	18	6,948,000
Approved 2003-2005 for later than 2005	475	18	8,550,000
Total	4,304		64,879,917

The analysis assumed that all the proposed MB projects for 2002 in the MLF Business Plan will be approved in 2002 (excluding the contingency list). If these projects are not approved in 2002, the MB reductions and costs need to be carried forward to 2003 and added to the replenishment total.

When considering cost-effectiveness values it was noted that large MB phase-out projects normally have cost-effectiveness values less than US\$18.0, but many large MB consuming-countries already have investment projects, so the vast majority of future MB projects will be for small and medium consumers where the cost-effectiveness value tends to be significantly higher than US\$18.0. The analysis showed that the sectors of tobacco seedbeds, post-harvest and structures generally have significantly higher cost-effectiveness values as well.

A6.3.4 Remaining MB Consumption After the 2003-05 Triennium

After the 2003-05 replenishment period, the MB consumption that remains to be funded is estimated to be more than 2,851 ODP-tonnes (i.e., 3,326 minus 475). The estimated funds required in trienniums after 2005 is therefore estimated to be approximately \$51,318,000 on the basis of US\$18 per ODP-kg (i.e., 2,851 ODP-tonnes at US\$18 per ODP-kg). In addition, US\$467,000 is committed in approved investment projects (Table A6-5), giving an estimated total of approximately US\$51,794,000 (i.e., US\$476,000 plus US\$51,318,000), based on the calculations and assumptions made in sections A6.2 and A6.3 above.

Appendix: TEAP Replenishment Task Force Questionnaire

App.1 Consultation

The TEAP Task Force in response to Decision XIII/1 prepared a questionnaire which covered aspects related to the ODS consumption and production sectors, institutional strengthening, and other issues that affect the calculations of the funding requirement.

The questionnaire was dispatched to all Parties, to members of the Ad-hoc Working Group on the 2003-2005 Replenishment, and to the members of the 2001 Executive Committee.

Responses were received from the following countries: Argentina, Australia, Bahrain, Barbados, Bolivia, Brazil, Cambodia, Canada, Chile, China, Colombia, Comoros, Costa Rica, Croatia, Czech Republic, Egypt, El Salvador, France, Germany, India, Ivory Coast, Jamaica, Macedonia, Mexico, Papua New Guinea, Peru, Poland, Spain, Sweden, Trinidad and Tobago, Turkey, and Uruguay. Of these, 24 are Article 5(1) Parties and 8 are non-Article 5(1) Parties. Responses from other organisations related to the protection of the ozone layer were also received.

App.2 Questionnaire

A copy of the questionnaire follows with a summary of the responses received. It is important to note that many Parties only answered some questions. In several cases, the same measure or policy proposal appears in different answer summaries because it was suggested by different Parties as answers to different questions. In other cases there may be slight nuances in the replies which cannot be accurately reflected in a brief summary such as the one that follows.

(Questions in italic, summary of responses in normal font).

Related to CFCs

- 1. The CFC projects approved during 2000/2001 –and those that will be approved during 2002- will largely address consumption levels in 2003, 2004 and 2005, due to the fact that their implementation will take a certain time period (projects to be approved in 2003 will only address consumption in 2005 if their implementation occurs within a time period of about 2 years). This implies that developing countries will be able to do forecasting whether they are on the right track towards (or maybe will achieve) the 50% reduction step for CFCs in 2005. Is this assumption right, and if not, which difficulties are foreseen?*

One non-Article 5(1) Party answered negatively and twenty six Parties responded affirmatively, of these nineteen are Article 5(1) Countries. Many

of them made the proviso that enough funding should be available on time. Of the Article 5(1) countries, two said that large consumption in the service sector and in SMEs might create difficulties if the country does not have an adequate capacity to monitor consumption; one Party pointed out that it has neither a country program nor has it received any support for institutional strengthening yet, due to its recent ratification of the Montreal Protocol.

Of the non Article 5(1) countries, one thought that measures to reduce consumption in the service sector will take more than two years and therefore it is too late to meet the reduction schedule in some countries. Several Parties differentiated between non-LVCs and LVC (the latter being harder to forecast in their opinion and more likely to have difficulties in case they do not have a well functioning licensing/quota system). It was also said that consumption reductions were expected due to reasons different to Multilateral Fund projects, i.e. commercial environment, competition and legal requirements.

2. *Certain Article 5(1) countries may come to a preliminary conclusion that it will be difficult to achieve 50% reduction in CFC consumption in the year 2005, i.e., they estimate that a substantial amount of extra efforts to reduce consumption will be needed after implementation of projects approved during 2000-2002. Which possibilities are there then to achieve the 50% reduction, or rather, which measures could be implemented and could still result in a reduction at short term?*

Several Parties suggested enacting local legislation (including a mandated 10% annual reduction in consumption), others also advanced the idea of improving supply controls such as import licenses, quotes and import fees both for ODS and ODS based equipment. Another proposal was to increase globally the prices of CFCs, while other countries preferred to emphasise recovery and recycle of refrigerants. Measures to facilitate the adoption of alternatives were mentioned. More controls and better monitoring of illegal trade were also asked for. One Party recommended that all projects be approved in 2002, another country stated that it is committed to a total phase-out by 2005. More demonstrative projects and bilateral cooperation were also requested. Another suggestion was a separate study for countries that may face difficulties to meet Protocol schedules. This idea was complemented by the proposal that projects should be tailored to the specific circumstances of each country who risks falling in non compliance.

Answers from non Article 5(1) countries included the following: Do not rely only on financial assistance from the Multilateral Fund, but try also to attract support from national and foreign sources. Concentrate efforts in those countries that risk non compliance and develop different approaches according to the size of the recipient country.

3. *Projects that will be approved during 2003-2005 will be implemented for the larger part during the period 2005/2008, i.e. they should aim at a reduction in the 70-80% range of the freeze level. Which type of projects are likely to be considered in your country in this period and which*

elements do you think these projects should contain during the 2003-05 period ?

Some Parties proposed granting fiscal benefits, several mentioned legislation including import controls on both ODS and equipment containing ODS. Some Article 5(1) countries emphasised the refrigeration sector, particularly with regard to SMEs, the service sub-sector and the training of trainers, technicians and practitioners from the informal sector. Awareness raising was also mentioned in several instances. In other cases specific projects were mentioned such as a solvent project for an aluminium factory, CFC free MDIs, boat refrigeration for fishing vessels and chiller retrofitting.

An Article 5(1) country requested avoidance of technologies that imply further reconversion processes i.e. HCFCs. An Article 5(1) and a non Article 5(1) country said that they expected an increase in umbrella projects, in sector phase-out plans, and RMPs.

4. *When developing long term strategies for the refrigeration sector to address the consumption in manufacturing (larger companies, SMEs) and in the refrigeration servicing sector (formal and informal), it will result in the development of integrated project proposals for the entire sector (umbrella projects, phaseout plans), i.e., a Refrigerant Management Plan. What do Article 5(1) and developed countries expect regarding the cost effectiveness of such projects (umbrella projects, phaseout plans) for high volume consuming countries compared to the cost effectiveness of similar projects in LVCs ?*

One Party said that costs are higher for informal shops and SMEs; several said that the cost effectiveness for LVCs should be higher (in numerical value) than for the high volume consumers, ranges were given from a minimum of 30% difference to a maximum of a 4-5-fold difference.

One non Article 5(1) Party suggested that non-LVCs should request funds for National Phase-out Plans with cost effectiveness between US\$5-9 / ODS kg, while other three proposed a range between 4 to 6 US\$ / ODS kg. One of these countries differentiated RMPs from National Phase-out Plans and provided a cost effectiveness of about US\$ 7-8 / ODS kg for RMPs which could go up to US\$ 30 / ODS kg in the case of VLVCs. This Party also mentioned that in its opinion chiller projects would only be approved through concessional loans. The cost effectiveness of 12,10 US\$ / kg given to non investment projects by the 35th executive Committee was mentioned. Other answers included the idea that neighbour LVCs should be covered by a single project to improve the economies of scale, and that RMPs should be reserved only to countries where most of the consumption of CFCs was in the service sector.

5. *The (low) price levels of CFCs and the relatively high prices of the alternatives have so far resulted in a delay of the reduction in consumption in many Article 5(1) countries. There must be a relation between the price,*

amounts produced and amounts consumed. Can you explain why, while production of CFCs is being reduced, the price of CFCs remains low in many developing countries? Do you believe that it is relevant and possible to consider earlier reduction steps (or faster phaseouts) than the ones agreed upon in the production sector phaseout plans? Which would be the implications of a faster phaseout in the production sector?

Five Parties believe that the decreases in demand have been matched by decreases in production, therefore relative demand has not changed. Four Parties suggest a faster phase-out of production, while one Party states that demand reduction is the best strategy. An alternative would be to increase the prices of CFC globally at the sources to curb illegal imports. It is expected that higher CFC prices will encourage recovery and recycling. One Article 5(1) country pointed out that the prices of alternatives has not decreased as expected with increased sales volume. It was suggested that imported alternative substances and equipment which relies on them should not be taxed.

Non-Article 5(1) Parties proposals include stopping, in the developed world, the production of CFCs to meet the basic domestic needs of Article 5(1) countries. There were several complaints against the transfer of technologies based on CFCs. The inclusion of the informal sector into integrated phase-out plans was considered essential in one case. The validity of the assumption stated in this question, that a delay exists in the phase-out because of low prices of CFCs, is rejected by some respondents, and one of them warns that the pace of production phase-out is the result of complex negotiations, which should not be modified. Seven Article 5(1) countries and one non Article 5(1) country express opposition against a faster phase-out.

6. *The servicing sector has become a more and more important part in Article 5(1) countries' consumption. This sector can be addressed (apart from the informal sector) via country integrated phaseout plans. Ample availability and a low CFC price impede implementation of such phaseout plans which have to be delayed. Calculations can be done by the Task Force. However, can you provide estimates for your country about the timeframe in which the price of CFCs has to increase to the point that the servicing sector can be addressed successfully? Please note that only under these conditions the reduced consumption in the servicing sector will contribute to the phasedown.*

Four Parties expect prices to increase in 2003-2005, another Party expects the increase between 2005-2006, and five countries say that it is difficult to estimate when this will happen. According to some answers, the only way to increase prices is through legislation. Two countries doubt that a direct relation exists between the prices of CFCs and their consumption in the service sector (i.e. it is cheaper to buy a little CFC than a new refrigerator). Some Parties reported success increasing CFC prices with quotas or with import fees. In one case, local prices of R-12 and R-134a are given as US\$ 2/lb and US\$ 6/lb respectively.

Related to methyl bromide

7. *The year 2002 will be the freeze year for the MB consumption in Article 5(1) countries. Do you expect that your 2001 MB consumption will be greater than the baseline (the average of the consumption during the years 1995-1998) ?*

Fifteen countries answered negatively and seven affirmatively, one of these blamed its situation on the delay to approve a project for the tobacco sector, another said that its baseline was incorrect and a VLVC explained that a surge in MB demand had been fuelled by the fast development of several golf courses. One country reported that the data is not available.

8. *The MB projects approved during 2000/2001 –and those that will be approved during 2002- will largely address consumption levels in 2003-2006, due to the fact that their implementation will take a certain time period (projects to be approved in 2003 will only address consumption in 2006-07 because their implementation occurs within a time period of about 4 years). This implies that developing countries will be able to do forecasting whether they are on the right track towards (or maybe will achieve) the reduction step for MB in 2005. Is this assumption right, and if not, which difficulties are foreseen ?*

Seventeen countries answered positively, of which one limited its answer only to those countries that have received funding for MB phase-out. Three Parties said that consumption could increase either because crops are transferred to Article 5(1) countries or because of international circumstances that cannot be controlled by the Party. The inherent unpredictability of agricultural projects and the possibility that alternatives are not successful were also mentioned. Concerns for the scarcity of approvals of MB projects and about the demands made by the Executive Committee were reported. One country, which expects to ratify the Copenhagen amendment at the end of 2002, believes that its late start in phasing out methyl bromide will make it impossible to achieve the reduction step in 2005. One non Article 5(1) country wondered whether consumption above the baseline of countries, which have not ratified the Copenhagen Amendment, would be eligible for funding.

9. *Which measures will be needed to allow you to meet higher reductions in MB consumption and production than the 20% reduction in the year 2005 and could you give an estimate of the cost of these measures ?*

Three countries asked for more demonstrative projects that are product specific, whereas an Article 5(1) Country asked for projects in all crops where MB can be used. Legislation, training of Plant Quarantine and other Preventive Officers, and the imposition of import quotes were non investment alternatives mentioned. Some Article 5(1) Country gave country specific figures of US\$ 6 million for projects in Soil Fumigation and in Grain Storage, US\$ 372,900 for an African country and US\$ 30,000 for a

Pacific Island Country. A cost effectiveness between 15 and 20 US\$/ ODP kg was mentioned for tobacco projects. Others said it is too early to tell.

A specific strategy for MB phase-out by 2008 was also given. An Article 5(1) country suggested that phase-out of MB should be accelerated. A non Article 5(1) Country stated that the costs for the 20% reduction scheduled for the year 2005 were already considered in the replenishment of 2000-2002.

- 10. How do you see the length of the time period needed to implement MB projects (after project approval) at present and do you expect that this time period will change for projects approved during the year 2002 and the triennium 2003-2006 ?*

Two countries answered affirmatively and the same number answered negatively. Nine Parties gave project implementation times, which are mostly in a range of 3-6 years. Two said that it is difficult to tell. Two Parties want projects to be made part of an integrated strategy towards total phase-out.

Related to CTC

- 11. Do you expect that your 2001 CTC consumption will be greater than the baseline (the average of the consumption during the years 1998-2000) ?*

Eleven Parties said no, three do not know and one expects a consumption greater than its baseline.

- 12. The CTC projects approved during 2000/2001 –and those that will be approved during 2002- will largely address consumption levels in 2003, 2004 and 2005, due to the fact that their implementation will take a certain time period (projects to be approved in 2003 will only address consumption in 2005 if their implementation occurs within a time period of about 2 years). This implies that developing countries will be able to do forecasting whether they are on the right track towards (or maybe will achieve) the 85% reduction step for CTC in 2005. Is this assumption right, and if not, which difficulties are foreseen ?*

Twelve countries agreed, two of them conditioned their answer to the availability of reliable data on actual use, particularly in the larger countries that report CTC consumption. Two countries do not know, and one does not agree. One country said that any forecast would depend on the approvals agenda of the MLF.

- 13. How do you see the length of the time period needed to implement CTC projects (after project approval) at present and do you expect that this time period will change for projects approved during the year 2002 and the triennium 2003-2006 ?*

One country disagrees, six do not know, one says that the time needed to implement projects in this area is 3 years. An Article 5(1) country believes implementation times can be shortened. A non Article 5(1) country expects a reduction from a current value of 3 years to a range between 18 to 24 months.

Related to halons

- 14. The year 2002 will be the freeze year for the halon consumption in Article 5(1) countries. Do you expect that your 2001 halon consumption will be greater than the baseline (the average of the consumption during the years 1995-1997) ?*

Fifteen countries answered negatively; one Party is not sure whether it has been using halon or not. Another mentioned that an impasse with an implementing agency on a project approved in the year 2000 could impede the country's meeting the freeze. One Party expects a consumption increase in 2002

- 15. The halon projects approved during 2000/2001 –and those that will be approved during 2002- will largely address consumption levels in 2003, 2004 and 2005, due to the fact that their implementation will take a certain time period (projects to be approved in 2003 will only address consumption in 2005 if their implementation occurs within a time period of about 2 years). This implies that developing countries will be able to do forecasting whether they are on the right track towards (or maybe will achieve) the 50% reduction step for halons in 2005. Is this assumption right, and if not, which difficulties are foreseen ?*

Yes according to sixteen countries, four Parties (two Non-Article 5(1) countries and two Article 5(1) country) warned that some difficulties in forecasting progress could be found because halons have a service sub-sector.

- 16. How do you see the length of the time period needed to implement halon projects (after project approval) at present and do you expect that this time period will change for projects approved during the year 2002 and the triennium 2003-2006 ?*

There were five negative replies. Two Parties gave periods that fall in the ranges of 12 to 18 month in one case, and 24 to 36 months in the other. Two other Parties mentioned time requirements of 3-4 and 5 years respectively, and another country said that halon projects are "very slow" to implement. The level of funding was associated in one instance to the time needed for implementation. One Article 5(1) country expects shorter implementation times in the future.

General

- 17. Has your country already signed both the London and the Copenhagen Amendment? If not, do you know if it plans to do so during 2002, or during the triennium 2003-2006 (could you be as precise as possible)? That should allow the Task Force a good basis for calculations to determine the replenishment of the Multilateral Fund for the period 2003-2006.*

Eighteen Countries said that they have ratified both Amendments, of which 15 are Article 5(1) Countries. Six Article 5(1) Countries said that they expect to sign the Copenhagen Amendment by the end of this year. One Party which has ratified the Copenhagen amendment is preparing to do the same with the London Amendment. Some non Article 5(1) countries omitted to answer this question and were not tallied in the yes column. One of them expressed concern that TEAP could consider officially any answer in which an Article 5(1) country announced its intent to sign the Copenhagen Amendment.

- 18. Will the role of implementing agencies such as UNDP, UNIDO, and the World Bank have to change after the year 2002, i.e. during the period 2003-2005? If so, which are the implications of this new role?*

Eighteen countries expect a change, five do not, and one proposes a periodical evaluation of the role of the agencies. Mention to the change of phase-out strategy to a country driven approach was widely noted. It is expected that as a result of this change the agencies will have more time and resources to execute projects more efficiently and more adjusted to the individual characteristics of recipient countries. An expected shift from investment projects to non investment project was mentioned. One Party suggested that UNEP must increase its support of National Ozone Units, while another proposed a better project follow up in general. Another proposal was the request that projects maximise the use of local resources. A VLVC requested the presence of consultants from the implementing agencies in the smaller countries. Another VLVC complained that these countries “have had to make do with under-funded, underdeveloped, and ultimately ineffective projects in the past”. Better synchronisation of agencies was also recommended.

Non Article 5(1) country answers included the observation that Implementing Agencies will need to assist countries with collecting reliable data and even undertaking audits. The possibility that the fixed share arrangement for implementing agencies is abandoned was mentioned as well as the need to give more consideration to linkages with climate change and management of hazardous wastes, Some suggested more emphasis on non investment activities such as promoting alternative technologies (PARC).

- 19. Country programmes and updated country programmes have usually been the basis for action, e.g. for the determination of which sectors should be addresses via which projects etc. In how far do you think further updates will be needed during the triennium 2003-2006?*

Twelve Article 5(1) countries said they should be done in 2002 or 2003, one Party said they are very important but did not provide any date, three Parties suggested biannual or triennial updates, and other proposed updates up to the year 2004. One country gave the date of 2005 as the latest for the actualisation of all country programs. Two countries said that they do not need further updates and one felt it needs one in 2005.

The role given by the 35th Executive Committee to Country Program Update funding was discussed and it was mentioned that the majority of these updates would be funded from the 2003-2005 replenishment.

A non Article 5(1) country said that in its opinion country programmes should be updated every 5 years. Two said that only non LVCs need to update their Country Programmes, because RMPs serve the same purpose of a Country Program for LVCs. Finally, one country expressed its concern that National Ozone Units have, in general, few people to develop country programs.

- 20. In formulating sector projects, aimed at phaseouts, the Article 5(1) country's domestic policies play an important role. Domestic policies can be developed, if not already done, but can these policies also be made effective? If not, could one describe which additional actions or assistance (above institutional strengthening) would be needed?*

Twenty one countries said clearly that domestic policies play an important role. In one case more funding for complementary activities was requested. Several Parties elaborated on their institutional strengthening needs, some mentioned the importance of having committed officials at the highest ranks of government. Integrated strategies and discussions with stakeholders were proposed. Other Parties suggested more focused help to National Ozone Units (NOUs). One Article 5(1) Country said that domestic policies are needed to control new production and consumption. Others mentioned the lack of specific regulations to make it possible to grant duty exemptions for import of environmentally friendly equipment and the lack of economic disincentives to discourage the use of ODS. One Party expressed appreciation for the help received to implement a Licensing System.

A non Article 5(1) country said that the lessons learned from the evaluation of institutional strengthening projects could improve their efficacy. Another said that it was to the Article 5(1) countries themselves to see that domestic policies are implemented and that there is little else that external bodies like the Multilateral Fund can do for them.

- 21. Non-investment projects, such as institutional strengthening, have not really led to an acceleration of the phase-out in Article 5(1) countries. Nevertheless, these projects can be very important for Article 5(1) countries. Do you agree that they are a priority for certain countries and if so, could the assistance that is required and the resource implications be specified? Would it be possible for your country to estimate the influence of*

non-investment projects on the ODS consumption level and what would be the “implementation timeframe” of these non-investment projects?

Twenty three countries answered that they are important, two said they are difficult to quantify. Four Parties expressed opposition to the statement made in the question that “Non-investment projects have not really led to an acceleration of the phase-out”. One Party attributed them a 25% responsibility in the implementation of country programmes with an implementation time of 5-7 years, but another Party estimated that they accounted for 70% of the phase-out. A shorter implementation of three years was also given, but several countries expressed the need to maintain NOUs active until ODS are definitively phased out. One Party asked for doubling the funding given for institutional strengthening.

It was mentioned that the 35th Executive Committee approved a 30% increase in funding for institutional strengthening. Regarding the Decision of the Executive Committee which gives a cost effectiveness value of 11.2 US\$ / ODP kg to these projects, one Article 5(1) Country asked: “As the decision itself did not define the scope of projects very well, RTF may wish to consider to clarify the non-investment activities into different categories, to define what could be calculated as ODP value, and which ones could not”.

22. *Within the framework of the issues raised in the two questions above, UNEP/DTIE has had a certain approach in assisting Article 5(1) countries before 2002. What is seen is the role of UNEP/DTIE during the period 2003-2005? Do you think there should be a difference compared to the period 2000-2002? If so, which are the implications of this new role?*

Eleven Countries said no difference, in one case conditioned only to the next three years. Seven countries said it should change; of these three are non Article 5(1) Countries. Countries expecting a change discussed those that have already happened in UNEP and which were approved in principle by the 35th Executive Committee. An Article 5(1) Country wanted help to improve implementation of RMPs, while another signalled the need to increase communication and cooperation between Article 5(1) Countries. The improvement of contacts between NOUs, Regional Networks, implementing agencies and experts on ODS alternatives was mentioned also. In one case more efforts to combat illegal trade was suggested. Two countries requested better availability of translated documents.

Answers from Non Article 5(1) countries included the following: “dissemination of information has been very intense during the last couple of years and written materials dealing with the same issues would not need to be multiplied...Obviously, publishing new brochures... should also be promoted if they concern new problems or bring new ideas”. The expectation that UNEP will address better the problems of ozone units. That it will have a more focused approach targeted to the particular needs of a given country and will monitor countries to identify well in advance those that risk being out of compliance was also indicated.

23. *Certain Article 5(1) countries may be well underway towards an early phase-out of certain ODS. In order to further support these countries, the Replenishment Task Force, in 1996 and 1999, used the definition of “maintaining momentum” to secure a certain amount of funds to support these countries. The character of projects and the control regime (from a grace period to compliance) have changed since then. What is your current viewpoint regarding such an approach?*

Eighteen countries said that it should be maintained. Of these, some proposed using this approach only as an incentive to those countries that have already phased out more ODS than is required for compliance. One of them considered that rather than “maintaining momentum” the proper description is “maintaining and strengthening momentum” to avoid a reversion to ODS. One Article 5(1) country and two Non Article 5(1) countries said it should not be considered anymore. A non Article 5(1) country said that the approach should be evaluated from the point of view of cost effectiveness. Another proposed using this approach only for MB.

24. *Assuming that fund availability will not be the limiting factor, what could be done in Article 5(1) countries to accelerate phase-outs of consumption and production? (Responses to this question may include your perception of the role of concessional lending).*

Several answers were in favour of awareness building, and of national legislation and training of public officials. Fiscal measures to improve Retrofitting, Recovery and Recycle were also mentioned as well as the actual supply of recycling equipment. Two Article 5(1) Countries asked for help to use HC refrigerants in existing equipment, and others requested more technology transfer. Subsidies to encourage use of alternatives by the informal sector were petitioned. Enactment of effective controls to phase out ODS supply was also mentioned. One Party believed that the assumption that “fund availability should not be the limiting factor” could not be made because funding is limited; other Party mentioned that they would not appreciate a larger funding to protect the ozone layer because Article 5(1) countries have other problems that are more important.

Several non Article 5(1) countries advocated the use of innovative financing including concessional lending that would allow a more efficient use of funds. Three countries suggested limiting concessional lending to large enterprises with a good economic situation or when a short term gain from the investment is expected. A non Article 5(1) country said that it does not believe that the use of concessional lending has any relation to availability of funds. An Article 5(1) country considered that concessional lending could delay the process of compliance although it could play a useful role in technology change for the servicing factor. The volatility of economics in most Article 5(1) countries was mentioned as an obstacle to its use. Four Article 5(1) countries said that they consider concessional lending as unacceptable, conversely there was a request from other Article 5(1) country on the need to maintain a phase-out approach based on grants. A non Article 5(1) country was also of the opinion that concessional lending should be

used with great care as an additional measure to complement phase-out activities based on grants.

25. *The Task Force expects to use broadly the same kind of analytical approaches to this Replenishment Study as were used for the 2000-02 Study. Please comment on those methodological issues you would like to bring to the Task Force's attention.*

There were many different answers to this question. In general, the approach used for the 2000-02 Study was approved, although one Article 5(1) country said that “no mathematical or empirical method must be used”. An Article 5(1) Country urged to work on the protection of the ozone layer instead of working on cold financial analysis.

One Party requested to concentrate on: Production sector, technology transfer and Process Agents; another suggested focusing on the needs of SMEs. Two Parties expressed their interest in specific data analysis of ODS by sector, particularly for CFCs. A proposal was made to budget additional resources in order to cover inefficiencies that currently cannot be easily solved, but that could force a second conversion in the future i.e. the replacement of HCFCs or of HFCs due to environmental reasons. One Article 5(1) Country requested that funds allocated for projects are transferred in a timely manner.

Non-Article 5(1) Country answers included the distinction between the circumstances of the two replenishment periods, particularly with regard to investment projects. The difference between financial completion of a project and the average time to achieve ODS phase-out was noted. More attention to the relationship to climate change and hazardous waste management. One party requested that the excess funds that implementing agencies return to the Multilateral Fund are deducted from the requirement funding. The same Party asked that the Advanced Funding that was included in the 2000-2002 Replenishment should be subtracted from the 2003-2005 Replenishment. Mention was also made of the two different methodologies to calculate consumption eligible for funding, which were discussed in the 35th Executive Committee. The hybrid nature of RMPs, which include a mixture of investment and non investment activities was also noted.

26. *Countries are invited to forward any concerns related to the determination of the 2003-2005 replenishment of the Multilateral Fund, which have not been covered in this Questionnaire.*

Article 5(1) countries insisted on the training of customs officers, indeed curbing illegal trade was mentioned often. Larger allocations for institutional strengthening were requested, and in several cases it was pointed out that this funding should be available till the year 2010. It was suggested that all priority areas identified in the strategic planning are considered, that contingency plans for non compliance situations are prepared, that an special analysis is made of the situation of LVCs with regard to those needs that are not covered by RMPs, that the cost of future

conversions to final technologies like hydrocarbons are considered, and that the RTF report be distributed to all Parties two months before the Twenty Second Meeting of the OEWG.

A Country that is applying for membership in the EU expressed that it would need to phase out ODS at a faster rate than what is mandated by the Montreal Protocol. One non Article 5(1) country recommended a careful determination of the funding replenishment that takes into consideration the donor country budgetary reality.

App.3 Conclusions drawn from Answers to the Questionnaire

The RTF appreciates the effort and support of the Parties that answered the questionnaire and the interviews conducted during the 35th meeting of the Executive Committee in Montreal. The answers received contain quite a number of different insights and evidence deep knowledge of the subject. There are several themes and approaches that have almost unanimous support, such as the importance given to the service sub-sector in refrigeration, the relevance of domestic policies, the implementation of licenses and quotas and the training of government officials. In many cases, these ideas appear in the answers of different questions depending on the interpretation given to the questionnaire by each person.

It is possible to conclude that with few exceptions, most Parties feel confident about their capacity to meet their obligations under the Montreal Protocol. Furthermore, donor countries also expressed their interest in concentrating their efforts in those countries more likely to face difficulties to phase out ODS in a timely manner.

Parties appear to be more confident regarding CFCs and Halons than regarding CTC and Methyl Bromide. In the case of CTC, the availability of better data from some key countries should be enough to dispel most doubts. In the case of MB the uncertainties related to agricultural processes, the longer times of implementation, and the fact that some Parties need to ratify the Copenhagen Amendment cast some doubts on the timely phase-out of this substance.

The perception that Implementing Agencies must change to adapt to the new circumstances of the phase-out process and to the new directives of the Executive Committee prevails. Simultaneously, widespread appreciation of their role and accomplishments is evident. The fact that the larger projects have been identified and approved forces a change in approach toward SMEs, the refrigeration service sector and some niche markets.

There was some disagreement about the pace of the phase-out. Eight countries expressed that they would not favour a faster phase-out, particularly

with regard to the production sector, but fifteen felt that the policies of maintaining momentum should be continued.

Concessional lending remains a contentious issue. This approach faces less opposition for projects with a clear and compelling contribution to phase-out, such as chillers. The role of non-investment projects was highlighted by a number of Parties, who asked for continuous institutional strengthening.

There is a widely held perception that protecting the ozone layer is a low national priority compared to other domestic problems faced by many Article 5 (1) countries. This explains why many nations voice the opinion that the only way for them to develop the infrastructure necessary to administer and oversee the phase-out is through Multilateral Funding.

The RTF attempted to take into consideration as many proposals made in the questionnaires as possible. In some cases opposing views make it impossible for any decision to satisfy all the Parties concerned. The RTF had to be vigilant that every assumption taken to prepare this report followed the previously adopted decisions by the Parties and by the Executive Committee.