MONTREAL PROTOCOL

ON SUBSTANCES THAT DEPLETE

THE OZONE LAYER

UNEP

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MAY 2017

VOLUME 4

ASSESSMENT OF THE FUNDING REQUIREMENT FOR THE REPLENISHMENT OF THE MULTILATERAL FUND FOR THE PERIOD 2018-2020

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Report of the
UNEP Technology and Economic Assessment Panel
Replenishment Task Force
May 2017, Volume 4

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

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TEAP thanks Keiichi Ohnishi, Asahi Japan, for hosting the TEAP meeting, 1-5 May 2017, where all the elements of this report were discussed by TEAP after review and where decisions were taken for the drafting of the final parts of the report before its submission to UNEP.

Foreword

The May 2017 TEAP Report

The May 2017 TEAP Report consists of four volumes:

Volume 1*:* Progress Report:

- TOC Progress Reports
- TEAP Essential Use Nominations Report May 2017
- Decision XXVIII/8 Report on issues related to the phase-out of HCFCs
- TEAP administrative issues and list of TEAP and TOC members at May 2017
- Matrix of Expertise

Volume 2*:* May 2017 TEAP Critical Use Nominations Report

Volume 3*:* Decision XXVIII/4 Task Force Report on Safety Standards Relevant for Low-GWP Alternatives

Volume 4*:* Decision XXVIII/5 (Replenishment) Task Force Report: Assessment of the Funding Requirement for the Replenishment of the Multilateral Fund for the Period 2018-2020

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THE REPLENISHMENT OF
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Executive Summary

1 Mandate

Decision XXVIII/5 of the Twenty Eighth Meeting of the Parties (MOP-28) provided the terms of reference for the work of the Technology and Economic Assessment Panel (TEAP) to prepare a report for submission to the Twenty Ninth Meeting of the Parties, through the Open-ended Working Group at its 39th meeting in 2017, to enable the parties to take a decision on the appropriate level of the replenishment of the Multilateral Fund (MLF) for the triennium 2018-2020.

Soon after MOP-28, TEAP established a Replenishment Task Force (RTF), with members from TEAP and its Technical Options Committees (TOCs). Some members attended the 77th and 78th Executive Committee Meetings (ExCom-77 and -78) in order to take into account any relevant discussions and decisions taken at these meetings that could have potential implications in the preparation of this report. At ExCom-77, the Executive Committee approved in principle the stage II HCFC Phase-out Management Plans (HPMPs) for nine countries and this funding approved in principle was reflected into the "Adjusted business plan of the Multilateral Fund for 2017-2019 after the 77th meeting of the Executive Committee (29 Dec 2016)" (UNEP/OzL.Pro/ExCom/77/76), also referred to as the "Business Plan," which served as a basis for this report.

Given that paragraph 4 of Decision XXVIII/5 also asked the TEAP to consider "the need for additional resources to enable Article 5 parties to carry out initial activities related to the phase-down of HFCs," the RTF considered it important to attend ExCom-78 which focused specifically on guidelines for funding the phase-down of HFCs. In paragraph 10 and other parts of Decision XXVIII/2, parties outline the funding considerations for phasing down HFCs and request "the Executive Committee to develop, within two years of the adoption of the Amendment, guidelines for financing the phase-down of hydrofluorocarbon consumption and production, including cost-effectiveness thresholds, and to present those guidelines to the Meeting of the Parties for the parties' views and inputs before their finalization by the Executive Committee." In view of the fact that such funding guidelines to phase-down HFCs are still under discussion, several categories of listed eligible costs have not been considered in this report.

The RTF relied on existing cost guidelines under the MLF where available. The RTF noted the limitation in any estimate provided, where these remained under discussion in the Executive Committee (i.e., cost guidelines for HFC phasedown activities).

2 Total funding requirement 2018-2020 (Chapter 8)

The total funding requirement for the 2018-2020 triennium can be calculated by adding the following components:

- Funding for HCFC consumption phase-out activities which consists of existing commitments from approved in principle stage I and stage II HPMPs and new planned activities for stage II and later stage HPMPs;
- Funding for HCFC production phase-out;
- Funding for non-investment components and supporting activities;
- Funding for HFC phase-down enabling activities; and
- Funding for HFC-23 mitigation activities.

The estimated **total funding requirement** for the replenishment of the Multilateral Fund for the next triennium 2018-2020 is presented in Table ES-1 below.

Table ES-1 Total funding requirement for the replenishment of the MLF 2018-2020 (US$ million)

Total requirement for replenishment of the Multilateral Fund	**2018-2020**
HPMP	391.91-491.85
HCFC Production	67.22
Non-investment and supporting activities	114.08-124.08
HFC phase-down enabling activities	21.5-44.2
HFC-23 mitigation	8.0-21.5
Total	**602.71-748.85**

The various components for funding are discussed below and the relevant elaborating chapters are indicated.

3 HPMP activities 2018-2020 (Chapter 3)

Table ES-2 Total funding requirement for HPMPs for the period 2018-2020 (including HPMP verification) taking into account HPMPs stage III mentioned in the business plan (US$ million)

Funding	**2018-2020**
Non-LVCs and LVCs HPMPs and HPMP verification	391.77-420.90
China HPMP stage III	0.0-70.81
LVCs HPMP stage III	0.14
Grand total 2018-2020	**391.91-491.85**

- Funding for HCFC consumption phase-out activities consists of existing commitments from stage I and stage II HPMPs and new planned activities for stage II and later stage HPMPs; it is estimated to be US$ 391.91-491.85 million for the period 2018-2020 (see Table 3-6).
- The total funding requirement for Non-LVCs and LVCs HPMPs and HPMP verification is estimated to be US$ 391.77-420.90 million for the triennium 2018-2020 (see Table 3-6), and is derived as follows:
    - Approved funding including calculation of planned activities for 2018-2020: the funding requirement for non-LVCs and LVCs for the triennium 2018-2020 is estimated at US$ 386.51 (see Table 3-3) and 16.16 million (see Table 3-4), respectively, a total of US$ 402.67 million;
    - Planned activities: Within the above total, US$ 108.89 million has been calculated for planned activities (see Table 3-3, 3-4). However, for the planned activities, there is significant uncertainty in the cost effectiveness of the yet to be approved (final) HPMP funding for non-LVC countries (US$ 97.10 million). Therefore a +/-15% range has been provided, i.e., US$ +/- 14.565 million;
    - Required funding for some countries to achieve the 35% reduction in HCFC consumption by 2020 plus some additional funding: US$ 1.90 million;
    - Funding for HPMP verification in the 2017-2019 updated business plan: US$ 1.77 million.
- In the business plan, US$ 70.809 million is allocated for the HPMP stage III plan for China in 2020. However, it remains unclear when it will be approved and how the different funding disbursements will then be planned (for which years) since it is likely to be dependent on the

progress that will be made with the HPMP Phase II plan for China, which was recently approved in principle at ExCom-77. Accordingly, for the triennium 2018-2020 this report provides a range of US$ 0.0-70.81 million for the funding tranche in 2020 (see Table 3-6).

- The amounts for the HPMPs stage III for two LVC countries (Armenia and Moldova), as presented in the business plan, have been included at US$ 0.14 million (see Table 3-6).

4 HCFC production phase-out funding 2018-2020 (Chapter 4)

- The total amount calculated for China and DPR Korea for production phase-out amounts to US$ 67.22 million (see Table 4-1).
    - Only two countries, China and DPR Korea, are currently eligible to receive funding during the 2018-2020 triennium for production phase-out;
    - China's progress report on stage I of its HCFC Production Phase-out Management Plan (HPPMP) indicates a reduction in production of at least 5,741 ODP tonnes and an additional reduction of idle capacity, with a total value of US$ 65.62 million for the period of 2018-2020;
    - DPR Korea is committed to phase out approximately 9.66 ODP tonnes of HCFC production by 2020. The funding estimated for this reduction is approximately US$ 1.6 million during the next 2018-2020 triennium.

5 Non-investment and supporting activities 2018-2020 (Chapter 5)

Table ES-3 Total funding requirement for non-investment and supporting activities for the triennium 2018-2020 (in US$ million)

Non-investment and supporting activities	**2018-2020**
Non-investment	
Institutional Strengthening (IS)	31.08
HPMP Preparation	
HPMP stage II PRP costs	4.35
HPMP stage III PRP costs	4.35
HCFC Demonstration Projects	0.0-10.0
Subtotal non-investment activities	*39.78-49.78*
Supporting activities	
UNEP CAP	34.80
Agency Core Unit costs	17.84
Secretariat and ExCom	20.16
Treasurer	1.50
Subtotal supporting activities	*74.30*
Total for non-investment and supporting activities	**114.08-124.08**

- The total estimated funding requirement for non-investment activities and supporting activities for 2018-2020 is estimated to be US$ 114.08-124.08 million;
- The adjusted Business Plan served as a basis for this report, noting that this plan was prepared by the MLF Secretariat based on information from the Implementing Agencies prior to the MOP-28 and was restricted to HCFCs;
- The total for non-investment activities for the triennium 2018-2020 is estimated to be US$ 39.78-49.78 million for 2018-2020 based on the following:

- Institutional Strengthening (IS), IA core unit budget, CAP and Secretariat support figures have been calculated taking into consideration current ExCom decisions;
- The report does not address any potential funding under these headings regarding new tasks related to the HFC phase-down;
- IS funding is calculated on the basis of amounts already indicated in the business plan for the years 2018, 2019 and 2020;
- HPMP preparation costs have been assumed to be similar to previous HPMP preparation costs, estimated at US$ 8.7 million for 2018-2020;
- To calculate costs for non-investment activities, two opposite assumptions can be made: either (i) by 2017-2018, no further demonstration projects on the feasibility of specific low GWP options will be agreed; or, (ii) in the triennium 2018-2020 a similar amount of funding compared to past triennia will be needed for the demonstration project window (about US$ 10 million). Therefore, a range of US$ 0-10 million is provided.

- Supporting activities (UNEP CAP, Core Unit, Secretariat and ExCom costs, Treasurer) have been determined on the basis of the previous funding agreements at US$ 74.30 million.

6 HFC phase-down enabling activities 2018-2020 (Chapter 6)

Table ES-4 Funding for HFC enabling activities (US$ million)

HFC phase-down enabling activities	**2018-2020**
Non-investment projects (including project preparation and demonstration projects)	13.5-20.2
Investment projects	8.0-24.0
Total	**21.5-44.2**

- The categories for enabling activities are as defined in paragraphs 10 of Decision XXVIII/2 as capacity-building and training, institutional strengthening, Article 4B licensing, reporting, demonstration projects and development of national strategies;
- The HFC phase-down funding guidelines are still being discussed and developed by the Executive Committee, so the Task Force primarily used historical funding of the above activities related to stage I HPMPs as a basis for estimating the funding for HFCs for 2018-2020;
- Non-investment, enabling activities including project preparation and demonstration activities are estimated in the range of US$ 13.5-20.2 million;
- Investment projects have included conversion projects to low-GWP alternatives that were previously identified in the June 2014 TEAP Replenishment Task Force Report on the funding requirement for the MLF replenishment for 2015-2017; these previously identified conversion projects are estimated in the range of US$ 8-24 million;
- Combining these two categories provides a total requirement for the 2018-2020 triennium in the range of US$ 21.5-44.2 million;
- In the absence of new guidelines and methodologies on cost calculations for financing the phase-down of HFCs, at this time the Task Force did not consider funding for investment projects for subsequent triennia after the 2018-2020 triennium.

7 HFC-23 mitigation activities 2018-2020 (Chapter 7)

Table ES-5 Funding for HFC-23 mitigation activities for 2018-2020 (US$ million)

HFC-23 mitigation	**2018-2020**
Enabling activities before 2020	0.8
Capital and operating costs (year 2020 only)	7.2-20.7
Total	**8.0-21.5**

- Funding to enable compliance to obligations related to HFC-23 mitigation under the Kigali Amendment are assumed to start from the year 2020 onwards;
- Funding for the year 2020 falls in the 2018-2020 triennium;
- Many HCFC-22 production plants in Article 5 countries have incineration facilities that were either established since 2004 under the Clean Development Mechanism, or were constructed in recent years as a result of national subsidy or regulation programs;
- The total funding requirement for HFC-23 mitigation is estimated to be in the range of US$ 8.0-21.5 million for the 2018-2020 triennium based on the following:
    - The capital costs (per year) for several HCFC-22 production plants and a best estimate for the range of operational cost per kg of HFC-23 mitigated. The operational cost per kg for HFC-23 is substantial, but considerably less than many values published so far; here it is assumed at US$ 0.5-1.5 per kg of HFC-23 mitigated;
    - Enabling costs to prepare for full operation in 2020 have been estimated at US$ 0.8 million, in case certain facilities that were built but have not been active in recent years.

8 Projected funding estimates for the 2021-2023 and 2024-2026 triennia (chapter 9)

Table ES-6 Indicative funding requirements for the following two triennia 2021-2023 and 2024-2026 (US$ million)

Funding requirement	**2021-2023**	**2024-2026**
Non-LVCs HPMPs, agreed	148.0	82.2
Non-LVCs, HCFC phase-out activities planned after 2020	250.7-338.5	250.7-338.5
LVCs, HPMPs agreed	0.65	0.74
LVCs, HCFC phase-out activities planned after 2020	30.0	10.0-20.0
HCFC production phase-out (China)	65.6	65.6
Non-investment and supporting activities funding (including HPMP and HFC project preparation activities)	117.3-125.2	116.6-125.3
Demonstration projects (for HFC phase-down)*	TBD	TBD
Investment projects for HFC phase-down*	TBD	TBD
HFC-23 mitigation**	21.6-62.1	21.6-62.1
Subtotal	**634.8-771.0**	**548.5-695.5**

* The amount for HFC phase-down activities for the two triennia has been filled in as "TBD", in the absence of guidance for HFC phase-down projects.

** This assumes that the HFC-23 mitigation funding (as determined for 2020, minus the enabling activities) would continue during each year after 2020

- For the triennium 2021-2023, funding in the range US$ 634.8-771.0 million has been estimated, with US$ 548.5-695.5 million estimated for the triennium 2024-2026. These estimates are largely based on known HCFC phase-down commitments;
- Estimated costs for planned HCFC funding is related to the amount of HCFCs that has not been addressed in agreed and planned activities through 2020. For this item the amounts of HCFCs not addressed through 2020 were considered, subtracting the amounts covered in multinational activities, while applying the current cost effectiveness factors from planned activities 2018-2020 (with their uncertainties);
- For non-investment activities a number of items could not be assessed (such as project preparation); IS funding was estimated as a range, varying from the current (2017-2020) funding level to a level that could be decided in 2020 by the Executive Committee (following Decision 78/6).
- These projections do not include the funding requirements for HFC phase-down projects, since the guidance on costing is not yet available. These estimates can be updated in future when the appropriate guidance will be available. This will likely add a substantial amount to the estimated costs for the two future triennia;

1 Introduction

1.1 Terms of Reference

Decision XXVIII/5 of the Twenty-Eighth Meeting of the Parties (November 2016) requests, in its paragraph 1, the Technology and Economic Assessment Panel (TEAP) to prepare a report for submission to the Twenty-Ninth Meeting of the Parties (November 2017), and to present it through the Open-ended Working Group at its 39th meeting (July 2017), to enable the Twenty-Ninth Meeting of the Parties to take a decision on the appropriate level of the 2018-2020 Replenishment of the Multilateral Fund.

1.2 Scope and Coverage

The text of Decision XXVIII/5 is as follows:

Recalling the parties' decisions on previous terms of reference for studies on the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol,

Recalling also the parties' decisions on previous replenishments of the Multilateral Fund,

1. To request the Technology and Economic Assessment Panel to prepare a report for submission to the Twenty-Ninth Meeting of the Parties, and to submit it through the Open-ended Working Group at its thirty-ninth meeting, to enable the Twenty-Ninth Meeting of the Parties to adopt a decision on the appropriate level of the 2018–2020 replenishment of the Multilateral Fund;

2. That, in preparing the report referred to in paragraph 1 of the present decision, the Panel should take into account, among other things:

(a) All control measures and relevant decisions agreed upon by the parties to the Montreal Protocol and the Executive Committee of the Multilateral Fund, in particular those pertaining to the special needs of low-volume- and very-low-volume-consuming countries, in addition to small and medium-sized enterprises, and the decisions of the Twenty-Eighth Meeting of the Parties and the Executive Committee at its meetings, up to and including its seventy-eighth meeting, insofar as those decisions will necessitate expenditure by the Multilateral Fund during the period 2018–2020;

(b) The need to allocate resources to enable all parties operating under paragraph 1 of Article 5 of the Montreal Protocol (Article 5 parties) to achieve and/or maintain compliance with Articles 2A–2E, 2G, 2H, 2I and 2J of the Protocol;

(c) The need to allocate resources to enable all Article 5 parties to meet compliance obligations relevant in the replenishment period 2018–2020 in respect of Article 2F of the Protocol, providing support for a transition to low-global-warming-potential (GWP) or zero-GWP alternatives in hydrochlorofluorocarbon (HCFC) phase-out, taking into account decision XIX/6 of the Meeting of the Parties and the extended commitments made by Article 5 parties under approved HCFC phase-out management plans;

(d) Rules and guidelines agreed upon by the Executive Committee at all its meetings, up to and including its seventy-eighth meeting, for determining eligibility for the funding of investment projects and non-investment projects, including, but not limited to, institutional strengthening;

3. That the Technology and Economic Assessment Panel should provide indicative figures of the resources within the estimated funding required for phasing out HCFCs that could be associated with enabling Article 5 parties to encourage the use of low-GWP or zero-GWP alternatives and indicative figures for any additional resources that would be needed to further encourage the use of low-GWP or zero-GWP alternatives;

4. The need for additional resources to enable Article 5 parties to carry out initial activities related to the phase-down of HFCs listed under Annex F and controlled under Article 2J;

5. That in preparing the report the Panel should consult widely, including all relevant persons and institutions and other relevant sources of information deemed useful;

6. That the Panel should strive to complete the report in good time to enable it to be distributed to all parties two months before the thirty-ninth meeting of the Open-ended Working Group;

7. That the Panel should provide indicative figures for the periods 2021–2023 and 2024-2026 to support a stable and sufficient level of funding, on the understanding that those figures will be updated in subsequent replenishment studies;

Decision XXVIII/5 is also related to Decision XIX/6 on Adjustments for Annex C, Group I substances (HCFCs), which mentions in several of its paragraphs:

"The Parties agree to accelerate the phase-out of production and consumption of hydrochlorofluorocarbons (HCFCs), by way of an adjustment in accordance with paragraph 9 of Article 2 of the Montreal Protocol and as contained in the annex to the present decision, on the basis of the following:

1. *For Parties operating under paragraph 1 of Article 5 of the Protocol (Article 5 Parties), to choose as the baseline the average of the 2009 and 2010 levels of, respectively, consumption and production; and*
2. *To freeze, at that baseline level, consumption and production in 2013;*
3. *For Parties operating under Article 2 of the Protocol (Article 2 Parties) to have completed the accelerated phase-out of production and consumption in 2020, on the basis of the following reduction steps:*
   - *(a) By 2010 of 75 per cent;*
   - *(b) By 2015 of 90 per cent;*
   - *(c) While allowing 0.5 per cent for servicing during the period 2020–2030;*
4. *For Article 5 Parties to have completed the accelerated phase-out of production and consumption in 2030, on the basis of the following reduction steps:*
   - *(a) By 2015 of 10 per cent;*
   - *(b) By 2020 of 35 per cent;*
   - *(c) By 2025 of 67.5 per cent;*
   - *(d) While allowing for servicing an annual average of 2.5 per cent during the period 2030–2040;*
5. *To agree that the funding available through the Multilateral Fund for the Implementation of the Montreal Protocol in the upcoming replenishments shall be stable and sufficient to meet all agreed incremental costs to enable Article 5 Parties to comply with the accelerated phase-out schedule both for production and consumption sectors as set out above, and based on that understanding, to also direct the Executive Committee of the Multilateral Fund to make the necessary changes to the eligibility criteria related to the post-1995 facilities and second conversions;*
6. *To direct the Executive Committee, in providing technical and financial assistance, to pay particular attention to Article 5 Parties with low volume and very low volume consumption of HCFCs;*
7. *To direct the Executive Committee to assist Parties in preparing their phase-out management plans for an accelerated HCFC phase-out;*
8. *To encourage Parties to promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations;*

9. To agree that the Executive Committee, when developing and applying funding criteria for projects and programmes, and taking into account paragraph 6, give priority to cost-effective projects and programmes which focus on, inter alia:

(i) Phasing-out first those HCFCs with higher ozone-depleting potential, taking into account national circumstances;

(ii) Substitutes and alternatives that minimize other impacts on the environment, including on the climate, taking into account global-warming potential, energy use and other relevant factors;

(iii) Small and medium-size enterprises."

The XXVIII/5 Task Force report was prepared on the basis of the Terms of Reference cited above.

1.3 Composition of the Task Force

The TEAP established a Replenishment Task Force (RTF) to prepare the report following Decision XXVIII/5. The composition of the Task Force is as follows:

Co-chairs were:

- Lambert Kuijpers (The Netherlands, member RTOC);
- Bella Maranion (USA, co-chair TEAP); and
- Shiqiu Zhang (China, senior expert member TEAP).

Members were:

- Paulo Altoe (Brazil, co-chair FTOC)
- Suely Carvalho (Brazil, TEAP Senior Expert)
- Daniel Colbourne (UK, member RTOC)
- Sukumar Devotta (India, member RTOC)
- Horace Nelson (Jamaica, member RTOC)
- Fabio Polonara (Italy, co-chair RTOC)
- Helen Tope (Australia, co-chair MCTOC)
- Dan Verdonik (USA, co-chair HTOC); and
- Helen Walter-Terrinoni (USA, member FTOC).

1.4 Consultation and Review Process

In November 2016, RTF members attended the Executive Meeting (ExCom-77) in Montreal (Dec 2016), and conducted informal discussions with countries, members or co-opted members of the Executive Committee, as well as with the Implementing Agencies. A summary is given in Annex 4 to this report. At this meeting, the stage I of the HPMP for one country was approved, bringing the total number of Article 5 countries with an approved stage I of an HPMP to 143. Stage II of HPMPs were approved in principle for nine countries. The Committee approved funding (including support costs) for tranches of HPMPs for stage I/stage II of HPMPs for 35 countries.

These decisions were reflected in the "Adjusted business plan of the Multilateral Fund for 2017-2019 after ExCom-77" (UNEP/OzL.Pro/ExCom/77/76), also referred to as the "Business Plan", which served as a basis for this report.

In April 2017, RTF members attended ExCom-78 in Montreal in order to follow the discussion of countries related to the development of cost guidelines for the phasedown of hydrofluorocarbons (HFCs), as these discussions and potential decisions could potentially inform its work. After extensive discussions, the Executive Committee deferred further discussion of cost guidelines to its next meeting, ExCom-79,

July 2017, in Bangkok. RTF members took the opportunity in the margins of this meeting to conduct follow-up, informal discussions with countries related to its work.

A draft report was developed in January-February 2017 and discussed at a first RTF meeting in Manchester, UK, 4-5 March 2017. Taking into account the issues raised in the discussions, the RTF developed a second, more complete draft before mid-April 2017. An external review of this draft report was conducted by four external peer reviewers and by the MLF Secretariat staff, and TEAP and its RTF are grateful for their efforts in support of this report. A semi-final draft was composed and circulated for discussions during the (annual) TEAP meeting in Kyoto, May 2017. Suggestions for the finalisation of the report were given to the Task Force. Subsequently the Task Force worked on the composition of a final draft, which was circulated by email to the TEAP for approval.

1.5 Overview of the Replenishment of the Multilateral Fund

The Multilateral Fund has been replenished eight times since its initial capitalisation of US$ 240 million for the period 1991-1993. The replenishments of the Multilateral Fund were as indicated below (with the amounts decided including the carry-over in brackets)[1]:

- 1994-1996 US$ 455 million (US$ 510 million);
- 1997-1999 US$ 466 million (US$ 540 million);
- 2000-2002* US$ 440 million (US$ 475.7 million);
- 2003-2005 US$ 474 million (US$ 573 million);
- 2006-2008 US$ 400.4 million (US$ 470 million);
- 2009-2011 US$ 400 million (US$ 490 million);
- 2012-2014 US$ 400 million (US$ 450 million);
- 2015-2017 US$ 437.5 million (US$ 507.5 million).

All UN member states are parties to the Montreal Protocol, and to several of its amendments. Since its inception, the Multilateral Fund has supported some 148 Article 5 countries by providing US$ 3.45 billion (including support costs) in project funding and capacity building to phase-out (276,609 ODP tonnes in consumption and 188,920 ODP tonnes in production of ODSs). The total income of the Fund stands at US$ 3.60 billion as of December 2016.

Other notable achievements are:

- Contributions to the Multilateral Fund amount to about 96% of pledges, up to the end of 2016;
- All decisions by the Executive Committee have been taken by consensus;
- 148 Article 5 countries have received financial assistance;
- 145 National Ozone Units have been established and are receiving funding;
- 9 Regional / Sub-regional Networks encompassing all Article 5 countries have been established;
- Financial assistance has been provided to phase-out 100 percent of the baseline consumption of CFCs, halons, TCA, CTC and methyl bromide;
- A majority of countries has served as members or co-opted members of the Executive Committee;
- In addition to the activities of the four Implementing Agencies, many projects have been carried out through bilateral co-operation provided by non-Article 5 countries.

With regard to the ongoing phase-out of HCFCs:

[1] *After 2002, replenishment amounts include the interest earned by the Fund*

- 143 Article 5 countries have received approval and funding for implementation of stage I of HCFC Phase-out Management Plans (HPMPs), of which 55 are non-Low Volume Consuming (non-LVC) countries;
- 9 HPMPs for LVC countries include commitments to achieve all HCFC control measures under the Protocol plus full phase-out before 2030;
- Policy guidance was agreed by the Executive Committee at its 71st and 72nd Meeting for the approval of project preparation funding and project implementation funding for stage II HPMPs;
- The first project preparation funding for stage II HPMPs was approved by the Executive Committee at its 72nd Meeting in May 2014 for about twenty Article 5 countries;
- More recently, a total of 23 stage II HPMPs were approved in principle by the Executive Committee, including for stage II HPMPs for nine countries at the 77th Executive Committee meeting in November 2016.

1.6 The Structure of the 2017 Replenishment Report following Decision XXVIII/5

The structure of the 2017 TEAP Replenishment Task Force Report is as follows:

The Executive Summary is presented first in this report, with separate parts referring to the separate chapters.

Chapter 1, "Introduction", presents the Terms of Reference, the establishment of the XXVIII/5 Task Force as well as the consultation and review processes for preparing this report.

Chapter 2, "Funding of the various stages of HPMPs for the period 2018-2020"

Chapter 3, "Results for the HPMP funding requirement"

Chapter 4, "Funding requirements for the HCFC production phase-down"

Chapter 5, "Funding requirements for non-investment and supporting activities for the 2018-2020 replenishment period and beyond"

Chapter 6, "Enabling activities for HFCs for 2018-2020 and beyond"

Chapter 7, "Methodology for determining funding for HFC-23 mitigation as of 2020"

Chapter 8, "Total funding requirement for the triennium 2018-2020"

Chapter 9, "Indicative figures for the funding requirements for 2021-2023 and 2024-2026"

Annex 1, "HCFC production and consumption", describes the Article 5 patterns in consumption of the different HCFCs, describes production and consumption data for all the relevant HCFC chemicals, and mentions specific production data for Article 5 countries. It also gives aggregated HCFC and baseline consumption for all countries in the four country groups, funding amounts and percentages of funding in the total funding, for each country in the four country groups.

Annex 2 provides tables with approved and planned (2017-2020) reductions in ODP tonnes and funding tranches for the period 2017-2020.

Annex 3 provides the text of Decision XXVIII/2 as taken at the MOP-28 in Kigali, October 2016.

Annex 4 provides a summary of the main issues addressed in the informal consultations by the Task Force.

2 Funding for the various stages of HPMPs for the triennium 2018-2020

2.1 Introduction

In response to the accelerated HCFC phase-out (Decision XIX/6), the Executive Committee approved guidelines for the preparation of HCFC phase-out management plans (HPMPs, decision 54/39) which set out a staged approach for the phase-out of a country's HCFCs within the framework of an overarching strategy. The first stage, stage I, of a country's HPMP addresses meeting the baseline freeze on HCFCs in 2013 and the 10 per cent reduction in 2015. Projects that accelerate the phase-out of HCFC consumption were considered on a case-by-case basis for LVC countries that had a strong national level of commitment in place to support accelerated phase-out (decision 60/15). In accordance with decision 60/44, LVC countries could choose between a stage I HPMP strategy that achieved the 2013 and 2015 phase-out targets or, if the country so decides, the 2020 phase-out target that achieved a 35% reduction. The vast majority of LVCs countries elected to have their stage I HPMP go through 2020. In addition, the Executive Committee considered a variety of factors in approving HPMPs, including national circumstances, cost-effectiveness, and whether the proposal included conversions to low-GWP alternatives.

As a result, the Executive Committee approved stage I HPMPs for non-LVCs that have target years between 2015 and 2020 with reduction percentages between 10% and 86.4%. Stage II HPMP have been approved with target years of 2020, 2021, 2022, 2023 or 2025 and reduction percentages varying from 35 to more than 67.5% (the mandated Protocol reduction compared to the baseline in the year 2025), i.e., 75% in the case of the stage II HPMP for Iran and Sudan.

In the case of LVCs (Low Volume Consuming Countries), most countries committed to an HPMP stage I with a target year 2020 and a reduction percentage of 35%. However, as usual there were some exceptions. In the period 2012-2013 several LVCs committed to a total phase-out in 2025 or 2030 with funding tranches spread over a long period. In addition, a handful of LVC countries elected to have their stage I HPMPs go through 2015; those countries have or will soon submit their stage II HPMPs to at least meet the 2020 reduction targets.

At the time the study for the funding requirement for the replenishment of the MLF 2015-2017 was done in 2014, limited HCFC consumption data were available for Article 5 countries (Article 7 reporting only included 2012 data). Furthermore, while most Article 5 countries approved stage I HPMPs, further assumptions for the years 2015-2017 had to be done. This was why the 2014 Replenishment Task Force decided to construct a time-dependent model for non-LVCs. Where reductions for specific chemicals had not been decided that had funding consequences for the 2015-2017 triennium, they were then assumed (calculated) in order to reach the required HCFC reduction by the year 2020. These assumptions consisted of certain choices of reducing HCFC consumption via the reduction of the consumption of certain HCFCs (HCFC-141b, HCFC-142b and HCFC-22), depending on the consumption mix of the various HCFCs in a country. As an extra parameter, the funding was spread over a number of years starting with the year of approval; the number of years and the funding profile over the years were subject to an extensive parameter study in the 2014 replenishment report.

2.2 Situation in 2017

Now that the process has reached the year 2017, all HPMP stages I have been approved (together with agreed funding tranches) with only two exceptions and many of them have been or are in the process of completion. As of 2015, non-LVC countries and implementing agencies started to prepare and submit HPMPs stages II towards the 35% consumption reduction (in 2020) and even more. As a result, there are now many HPMPs stage II approved in principle (23 in total, as of ExCom-77), with funding tranches in

certain years (as of the year 2016, up to the year 2026, depending on the size of the HPMP, the feasibility of a staged approach, national circumstances, and other factors). As a result, approved stage I and stage II HPMPs will lead to a reduction of certain HCFC amounts (expressed in ODP tonnes). Most of the funding tranches can be found in the period through 2020 (see Fig. 2-1), but definitely not all tranches (very much dependent on the target year of the HPMP stage II for a specific country).

As already mentioned, the stage I HPMPs for the overwhelming majority of LVC countries were targeted for 2020 and will need to be completed in about 2.5 years from now (for a 35% reduction by 2020). This has already lead to the submission of some LVC stage II HPMPs that will go until 2025 (or further). For the LVC stage II HPMPs, the reductions towards the 67.5% reduction are expected to start in 2020, with first funding tranches in the year 2020 (this implies that these first tranches are part of the 2018-2020 funding requirement for the replenishment of the MLF). Further tranches will be disbursed after 2020, but these will be part of indicative funding amounts for the triennia after 2018-2020.

2.3 Calculation of funding requirement based available 2017 data

The construction of a funding related HCFC phase-down model is superfluous and impracticable, given the variety of stages and approaches adopted in the approved HPMPs as indicated below:

- There are now various types of non-LVC stage II HPMPs that have been approved in principle, with different start years, with different target years, and with agreed funding tranches during 2017-2020 (and possibly beyond);
- That, so far, not approved, planned HPMP stages are used (via business planning) with funding amounts as well as amounts of specific HCFCs to be phased out as of certain years;
- That the recent Business Plan used for the Report was submitted by agencies prior to the 2016 MOP and endorsed by the ExCom; here only one country has a project preparation request for a stage III HPMP during 2018-2020;
- That, there are LVC HPMPs stage II planned with certain amounts in the first year 2020.

For these reasons the funding requirement for HCFCs for all eligible Article 5 countries has been calculated using a funding analysis for each country. One then has to take into account the approvals (in principle) that occurred through the ExCom-77 (in principle for the period 2018-2020) as well as the planned HPMP activities (if these approvals did not occur ultimately at ExCom-77), as they are given in the Business Plan.

2.4 Cost effectiveness

Cost effectiveness factors for the period 2017-2020 from HPMPs approved in principle can be taken from the various approvals, they vary substantially, depending in part on the country and the specific activity.

According to the Business Plan, planned activities for foams use cost effectiveness factors of US$ 6.3 and 7.0 per kg, depending on certain approvals planned (i.e., US$ 6.74 and 7.49 per kg including agency support costs).

Planned activities for R/AC use cost effectiveness factors of US$ 7.6 and 8.4 per kg for non-servicing, depending on certain approvals planned (i.e., US$ 8.1 and 9.0 per kg including support costs). For servicing (virtually all amounts concerned), the agreed cost effectiveness of US$ 4.8 per kg has been used (i.e., US$ 5.14 per kg including agency support costs).

The cost effectiveness factors used in the Business Plan may be lower or higher once the planned activities will be approved by the Executive Committee. For this study, the RTF considered it not important to further analyse the cost effectiveness factors for the activities approved in principle and the planned

activities. Data given yield enough funding information through the year 2020. For an indicative calculation of funding requirements for 2021-23 and 2024-26, the overall numbers (combined with the amounts approved in principle or planned) are assumed to give adequate information to determine future funding requirements.

2.5 Calculation of HPMP funding requirement and approved amounts 2018-2020

Information on the agreed stage I and II HPMP funding tranches per country for the years 2017-2020 (and if agreed in principle, also for the years beyond 2020) have been made available by the Multilateral Fund Secretariat, both for non-LVC and LVC countries. In the Business Plan, all HPMP stage II planned activities can be found both for non-LVC and LVC countries (funding amounts per specific year (specified per agency) as well as ODP tonnes of certain HCFCs involved in this funding). All the funding amounts given for HPMPs in the relevant documents are including agency support costs. Two LVC countries and one non-LVC country have an HPMP stage III with funding proposed for the year 2020 and beyond. For this non-LVC country, a funding range has been considered in relation to this HPMP stage III for the next triennium.

The Multilateral Fund Secretariat has issued a document in which for all countries (both non-LVC and LVC) the baseline or starting point amounts are given, as well as the amounts approved in principle through ExCom-77 as well as the amounts remaining (i.e., still to be addressed after ExCom-77). This document also gives the percentage approved of the baseline or starting point amount (per chemical and for the total amount of chemicals, by using ODP tonnes). The Business Plan 2017-2019 also gives the ODP amounts planned to be approved per country in certain years. Assuming that all planned activities will take place as given, one can (next to the funding amounts) also calculate the percentage of ODP tonnes (of baseline or starting point) that are related to these planned activities. This percentage can be added to the percentage "approved" before January 2017, to give a percentage "approved" as can be expected by January 2021. It should be noted that January 2021 is one year later than that the HCFC Montreal Protocol control schedule mandates a 35% reduction in consumption compared to the (average 2009-2010) HCFC baseline.

These numbers can all be put together in one spreadsheet for further analysis:

1. Approved amounts (in principle) before January 2017 (through ExCom-77);
2. Percentage approved (in ODP tonnes) before January 2017 (through ExCom-77);
3. Funding amounts for HPMPs approved in principle, for the separate years 2017, 2018, 2019 and 2020;
4. Percentage of baseline (in ODP tonnes) planned between January 2017 and January 2021;
5. Total percentage approved (in ODP tonnes) expected or planned before January 2021;
6. Funding amounts planned to be approved (in principle) before January 2021, for the separate years 2017, 2018, 2019 and 2020.

It is possible to calculate the amounts approved and planned as well as the funding requirement, where the specific results are given in chapters 3 and 4, respectively.

Using the available data, it is possible to calculate the funding requirement for the period 2018-2020 from approvals in principle plus the requirement for the planned HPMP activities. To this funding requirement a small amount will have to be added for some countries that will receive (following the business plan 2017-19) some extra funding. Separately, an amount for a few countries (see spreadsheet in Annex II)) that have not been considered in the business planning to reach a reduction percentage of 35% by the year 2020 has to be determined as well. In the business planning, a certain amount is reserved for HPMP verification per year, which will have to be added to the HPMP funding requirement for 2018-2020.

For information purposes, Table 2-1 gives the approved HPMP funding for the separate years from 2017 through 2026 (non-LVC and LVC countries) and Table 2-2 gives total funding for the total amounts approved, this also for the periods 2009-2016 (through ExCom-77) and 2017-2026 (there are two small amounts in 2030-2031 at US$ 168,563, which bring the total HPMP funding to US$ 1,384,044,113).

Table 2-1 Approved funding for HPMPs (stages I and II) for the period 2017-2026 and the total funding amount approved for the period 2009-2026 (from "HPMPMYA as of December 2016", MLFS)

Funding approved (in principle) (US$)	**Total (2009-2026)**	**2017**	**2018**	**2019**	**2020**
Non-LVCs	**1,340,309,377**	84,003,454	127,087,683	69,486,057	92,834,430
LVCs	**43,566,173**	2,727,688	2,673,150	537,725	2,921,356
Total	**1,383,875,550**	86,731,142	129,760,833	70,023,782	95,755,786
2021	**2022**	**2023**	**2024**	**2025**	**2026**
76,256,097	40,021,565	31,027,991	26,059,111	25,407,880	30,000,000
265,790	226,000	164,507	0	639,700	93,315
76,521,887	40,247,565	31,192,498	26,059,111	26,047,580	30,093,315

Table 2-2 Funding amounts approved for HPMPs (stages I and II) for the period 2009-2026 and for the periods 2009-2016 and 2017-2026 (from "HPMPMYA as of December 2016", MLFS)

Funding approved (in principle) (US$)	**Total (2009-2026)**	**Total (2009-2016)**	**Total (2017-2026)**
Non-LVCs	1,340,309,377	738,125,109	602,184,268
LVCs	43,566,173	33,316,942	10,249,231
Total	**1,383,875,550**	**771,442,051**	**612,433,499**

Table 2-1 provides the funding amounts that have been approved (in principle) for each year during the period 2017-2026. The funding for LVC countries, mainly aimed at the 35% reduction in consumption by 2020 is only a relatively small part of the total after 2020. Total funding (in tranches, approved in principle) for the period 2009-2026 for non-LVC and LVC countries amounts to US$ 1,383,875,550 (of which about 3% is for LVC countries). This is the total funding approved in principle, but this does not mean that the funding has already been used for the implementation of HPMPs, as mentioned before. Also a large part of the funding tranches approved and disbursed for the years 2014-2016 still have to be implemented. All funding tranches approved for the years after 2016 will have to be made available in the near future (2017 and years beyond), after which the implementation will follow and may take an additional number of years.

Table 2-2 clarifies what has been mentioned regarding approvals before a certain moment in time and the funding related to it. Here one should not focus so much on the LVC part, but on the non-LVC part only. In this case, for non-LVC countries, the amounts for the periods 2009-2016 and 2017-2026 are comparable. Funding tranches for the second period still need to be disbursed in future (starting in 2017). It will be clear that most tranches are for achieving the 35% reduction by 2020, lower amounts are for achieving reductions beyond (see the approved funding level before and after 2021 in Fig. 2-1). All approvals related to the funding for the second period through 2026 are defined as the approvals before January 2017.

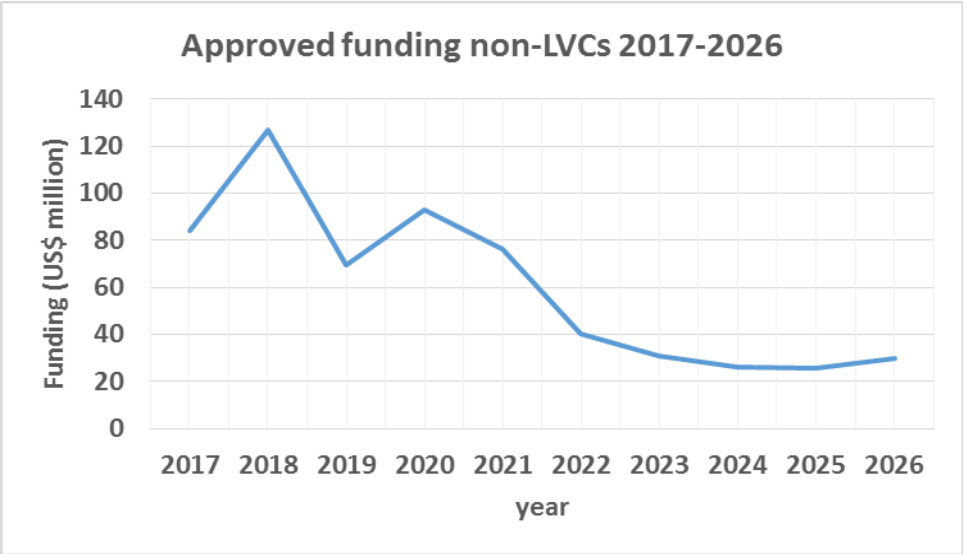

Fig. 2-1 Funding approved (in principle) for non-LVC countries for 2017-2026, tranches per year (compare table 2-1)

Annex 1 contains the 2009-2010 HCFC baseline consumption of the various non-LVC and LVC countries (in descending consumption order, for the defined four country "consumption" groups), as well as the percentages of total funding and approved reductions in ODP tonnes. About 53% (in ODP terms) of total baseline consumption is reported as baseline by China; up to January 2017, almost 63% of the total approved (but not disbursed) funding (this includes HPMP stage II) through 2016 had been approved for China. The baseline percentages for all countries in the defined group 2 in this report vary between 0.18-4.85% of the total, and the percentage of the funding varies by a similar range (between less than 0.1% and about 5%). The same applies to the percentages that can be calculated for the ODP tonnes approved per country or groups of countries in the total amount of ODP tonnes approved through 2016. There is no direct link between the approved funding and the ODP tonnes approved since cost effectiveness and the composition of the HCFC mix may vary substantially per country.

3 Results for the HPMP funding requirement

3.1 Reductions in ODP tonnes approved and planned to be approved for HPMPs

The approved amount as a percentage of the baseline or starting point value (though ExCom-77) can be taken from the Multilateral Fund Secretariat document for the countries separately, and can be calculated for the consumption-defined group of non-LV or LVC countries (see Annex 1) as a total. Planned amounts can be taken from the business planning document, which takes into account all activities for countries separately (until January 2021), and can then be calculated for the consumption-defined groups of non-LVC (group 1, 2 and 3) and all LVC countries (group 4).

			ODP tonnes approved all (I and II - ExC 77)							ODP tonnes BP plan (HPMP II planned)							TOTAL	1-1-2021	
Country	Target		Chem	Total	Appr	Remain	Appr perc		Country	Chem	2017	2018	2019	2020	Base	App 17-2	App total	Remain	Perc appr	Appr
Afghanistan	35,00	2020	HCFC-22	23,8	8,33	15,47	**35,00**	**8,33**	Afghanistan	HCFC-22					23,8	0	8,33	15,47	**35,00**	**8,33**
Algeria	20,00	2017	HCFC-141b	5,7	3,97	1,73	**69,65**		Algeria	HCFC-141b		5,36			5,7	5,36	9,33	-3,63	**163,68**	
Algeria	20,00	2017	141bPolyol	5,36	0,00	5,36	**0,00**		Algeria	141bPolyol					5,36	0	0	5,36	**-**	
Algeria	20,00	2017	HCFC-22	24,50	10,51	13,99	**42,90**		Algeria	HCFC-22		10,23		9,53	24,50	19,76	30,27	-5,77	**123,55**	
				35,56	14,48	21,08	**40,72**	**14,48**			0,00	15,59	0,00	9,53	35,56	25,12	39,60	-4,04	**111,36**	**39,60**
Argentina	18,00	2017	HCFC-123	1,57	0,00	1,57	**0,00**		Argentina	HCFC-123					1,57	0	0	1,57	**-**	
Argentina	18,00	2017	HCFC-22	266,20	59,57	206,63	**22,38**		Argentina	HCFC-22	10		15		266,20	25	84,57	181,63	**31,77**	
Argentina	18,00	2017	HCFC-141b	94,57	23,96	70,61	**25,34**		Argentina	HCFC-141b	6,5736	19,713	19,71	19,713	94,57	65,7111	89,6711	4,90	**94,82**	
Argentina	18,00	2017	HCFC-124	0,83	0,00	0,83	**0,00**		Argentina	HCFC-124					0,83	0	0	0,83	**-**	
Argentina	18,00	2017	HCFC-142b	14,34	0,00	14,34	**0,00**		Argentina	HCFC-142b	1,3464	4,0375	4,038	4,0375	14,34	13,4589	13,4589	0,88	**93,86**	
				377,51	83,53	293,98	**22,13**	**83,53**			17,92	23,75	38,75	23,75	377,51	104,17	187,70	189,81	**49,72**	**187,70**
Bahrain	42,00	2020	141bPolyol	10,11	0,00	10,11	**0,00**		Bahrain	141bPolyol					10,11	0	0	10,11	**-**	
Bahrain	42,00	2020	HCFC-22	51,46	22,77	28,69	**44,25**		Bahrain	HCFC-22	5,5			2	51,46	7,5	30,27	21,19	**58,82**	
Bahrain	42,00	2020	HCFC-141b	0,44	0,44	0,00	**100,00**		Bahrain	HCFC-141b					0,44	0	0,44	0	**100,00**	
				62,01	23,21	38,80	**37,43**	**23,21**			5,50	0,00	0,00	2,00	62,01	7,5	30,71	31,3	**49,52**	**30,71**
Bangladesh	30,00	2018	HCFC-124	0,07	0,07	0,00	**100,00**		Bangladesh	HCFC-124					0,07	0	0,07	0	**100,00**	
Bangladesh	30,00	2018	HCFC-141b	21,23	20,20	1,03	**95,15**		Bangladesh	HCFC-141b					21,23	0	20,2	1,03	**95,15**	
Bangladesh	30,00	2018	HCFC-123	0,21	0,21	0,00	**100,00**		Bangladesh	HCFC-123					0,21	0	0,21	0	**100,00**	
Bangladesh	30,00	2018	HCFC-22	45,42	3,48	41,94	**7,66**		Bangladesh	HCFC-22	2,41	5,82	1,81	0	45,42	10,04	13,52	31,9	**29,77**	
Bangladesh	30,00	2018	HCFC-142b	5,72	0,57	5,15	**9,97**		Bangladesh	HCFC-142b					5,72	0	0,57	5,15	**9,97**	
				72,65	24,53	48,12	**33,76**	**24,53**			2,41	5,82	1,81	0,00	72,65	10,04	34,57	38,08	**47,58**	**34,57**
Benin	35,00	2020	HCFC-22	23,80	8,33	15,47	**35,00**	**8,33**	Benin	HCFC-22			1,34	5,88	23,80	7,22	15,55	8,25	**65,34**	**15,55**
Brazil	45,00	2021	HCFC-142b	5,61	0,00	5,61	**0,00**		Brazil	HCFC-142b					5,61	0	0	5,61	**-**	
Brazil	45,00	2021	HCFC-22	792,00	214,66	577,34	**27,10**		Brazil	HCFC-22					792,00	0	214,66	577,34	**27,10**	
Brazil	45,00	2021	HCFC-141b	521,70	469,70	52,00	**90,03**		Brazil	HCFC-141b					521,70	0	469,7	52	**90,03**	
Brazil	45,00	2021	HCFC-124	7,73	0,00	7,73	**0,00**		Brazil	HCFC-124					7,73	0	0	7,73	**-**	
Brazil	45,00	2021	HCFC-123	0,30	0,00	0,30	**0,00**		Brazil	HCFC-123					0,30	0	0	0,3	**-**	
				1.327,34	684,36	642,98	**51,56**	**684,36**			0,00	0,00	0,00	0,00	1.327,34	0	684,36	642,98	**51,56**	**684,36**

As illustrated above for some sample countries, it should be noted that the tables put together by the Task Force (and also the tables made available by the Multilateral Fund Secretariat) give the amounts in ODP tonnes (and in percentage of baseline or starting point) approved up to a certain date (e.g. through ExCom-77, or until the beginning of 2017).

The approved amounts will be realised once all approved projects (through ExCom-77) have been implemented. In case of the planned amounts during 2017-2020 (including stage I HPMPs), this may well be in 2020, 2022 or 2025 before that these amounts (that are planned to be funded) will have been implemented.

This also is an explanation for the fact that the approvals (in principle) given until 2017 are the basis for a significant percentage, where a large part of that percentage will have to be funded in future years (in years after 2016, until even 2025, as in the case of the HPMP stage II for China, but also for countries with an approved phase-out in the stage I HPMP). With this as background, it can be understood that the planned approvals for the period 2017-2020 are only a small part of the total amount of approvals until January 2017; this in particular because all the approvals for China for the stage II HPMP are given in the amount until January 2017.

There is a relation between the total funding approved (through ExCom-77) and the total amounts of ODP tonnes approved. The table giving the total amounts approved, and the amounts spread over the period 2017-2026 clarifies this.

It is possible to calculate the reductions (in ODP tonnes) approved before January 2017 (through ExCom-77), planned to be approved before January 2021 (during the period 2017-2020), as well as the total amounts, i.e., the amounts approved and planned to be approved. This can be done for non-LVCs and LVCs as in the tables below.

Table 3-1 Amounts approved in principle (up to January 2017) or planned to be approved (2017-2020) and the sum of the two (up to January 2021)

Country type	before January 2017 (ODP tonnes)	2017-2020 (ODP tonnes)	before January 2021 (ODP tonnes)
Non-LVCs	19,463.9	1,075.9	20,569.8
LVCs	246.4	64.0	310.4
Total	**19,710.3**	**1,139.9**	**20,880.2**

Instead of the amounts in ODP tonnes, one can also calculate the percentage of the baseline or starting point of these amounts, for non-LVCs and LVCs, this for the period until January 2017 or January 2021.

Table 3-2 Amounts approved in principle (until January 2017) or planned to be approved (2017-2020) and the sum of the two (before January 2021) (all expressed in percentages of respective baselines)

Country type	Baseline/starting point (ODP tonnes)	Before Jan 2017	Before Jan 2021
Non-LVCs	32,719.0	59.5%	62.9%
LVCs	461.8	53.4%	67.2%
Total	**33,180.8**	**59.4%**	**62.9%**

The above tables 3-1 and 3-2 illustrate the issue of phased approach reductions as mentioned above, especially for non-LVC countries. Of the 20,880 ODP tonnes approved in principle and planned to be approved before January 2021 only 1,140 ODP tonnes are planned for the period 2017-2020, or about 5% of the total (3.4% of the baseline consumption in ODP tonnes).

However, of the 19,710 ODP tonnes approved in principle, a large portion still has to be funded (via funding disbursements through the year 2026) and implemented in future.

3.2 Funding requirement for HPMPs as of 2017 and for 2018-2020

The funding requirement for non-LVCs for the years 2017-2020, in totals per year, has been calculated for the activities approved in principle and for the planned activities; see table 3-3 below. Totals for the years 2018, 2019 and 2020 have been given, as well as the total for the triennium 2018-2020.

Table 3-3 Funding tranche requirements for HPMPs (stages I and II) for the years 2017-2020 and total for the triennium 2018-2020, for non-LVC countries

Non-LVCs / per year (US$)	**2017**	**2018**	**2019**	**2020**
Approved in principle	84,003,454	127,087,683	69,486,057	92,834,430
Planned	13,506,840	34,265,845	24,083,339	38,749,505
Total	97,510,294	161,353,528	93,569,396	131,583,935
Subtotals for 2018-20		**161,353,528**	**93,569,396**	**131,583,935**
Total for 2018-2020	**386,506,859**			

The funding requirement for LVCs for the years 2017-2020, in totals per year, has been calculated for the activities approved in principle and for the planned activities; see table 3-4 below. Totals for the years 2018, 2019 and 2020 have been given, as well as the total for the triennium 2018-2020.

Table 3-4 Funding tranche requirements for HPMPs (stages I and II) for the years 2017-2020 and total for the triennium 2018-2020, for LVC countries

LVCs / per year (US$)	**2017**	**2018**	**2019**	**2020**
Approved in principle	2,727,688	2,673,150	537,725	2,921,356
Planned	889,657	56,115	499,035	9,468,028
Total	3,617,345	2,729,265	1,036,760	12,389,384
Subtotals 2018-2020		**2,729,265**	**1,036,760**	**12,389,384**
Total for 2018-2020	**16,155,409**			

By adding the various elements:

(1) the approved HPMPs,
(2) the planned HPMP phase-down activities (Business Plan 2017-19),
(3) the extra funding for some countries, and
(4) the HPMP verification,
the total funding amount for the triennium 2018-2020 for HPMPs and HPMP related activities (monitoring) can be determined.

Table 3-5 Elements for the total funding requirement for HPMPs for the period 2018-2020 (including HPMP verification)

Funding (US$)	(Subtotals non-LVCs and LVCs)	**2018-2020**
Non-LVCs (approved)	289,131,283	386,506,859
Non-LVCs (planned)	97,098,689	
LVCs (approved)	6,409,118	16,155,409
LVCs (planned)	10,023,178	
Funding for countries not covered to reach 35% by 2020 and certain additional (country) funding		1,903,507
HPMP verification		1,765,800
Total 2018-2020		**406,331,575**

The amount for planned non-LVC activities for the triennium is determined at US$ 97,098,689. It could be anticipated that this amount could be 15% lower once it will be approved by the Executive Committee, or alternatively, it could be 15% higher related to HPMP activities with higher costs than calculated via the CE factors used, e.g., for SME related activities or similar). Therefore, an amount of +/- US$ 14.565 million would have to be taken into account in the total. As a result, a range of US$ 391.77-420.90 million is estimated for the above determined HPMP funding requirement.

3.3 HPMPs stage III

The Business Plan 2017-2019 mentions three HPMPs stage III where funding would occur in the triennium 2018-2020 (China and two LVC countries). In the case of China (where it concerns various sub-sectors) the funding given in the Business Plan indicates US$ 70.809 million for 2020 (and US$ 283.236 million after 2020). The HPMP stage II targets a 35% reduction by 2020, a phase-out of the HCFC foam and solvent sectors by 2026, "where the 2025 consumption limits for the Industrial and Commercial Refrigeration (ICR), R/AC and servicing sectors will be defined in 2020, considering, inter alia, the technical feasibility of low GWP alternatives" (ExCom 76/25, p.8). Funding for these sectors has essentially been decided until 2021. However, because of the uncertainties in relation to the rate of progress of the HPMP stage II plan for China, a follow-up stage III HPMP for China in 2020 has been considered here, with a range of US$ 0.0-70.81 million. The planned amounts for the stage III HPMPs for two LVCs (Armenia and Moldova) have been taken into account in the total funding requirement for the triennium 2018-2020 since they also have a small preparatory funding component in the Business Plan.

3.4 Total HPMP funding requirement 2018-2020

The total funding requirement range for HPMPs for the period 2018-2020 is presented in Table 3-6 below.

Table 3-6 The total funding requirement for HPMPs for the period 2018-2020 (including HPMP verification) taking into account HPMPs stage III mentioned in the business plan (US$ million)

Funding	**2018-2020**
Non-LVCs and LVCs HPMPs and verification	391.77-420.90
China HPMP stage III	0.0-70.81
LVCs HPMP stage III	0.14
Grand Total 2018-2020	**391.91-491.85**

4 Funding for HCFC production phase-out

4.1 Introduction

Based on the current guidelines and the Agreements between Article 5 countries that produced CFCs and the Executive Committee, at this time only two countries, China and DPR Korea, are currently eligible to receive funding during the 2018-2020 triennium. The Executive Committee decided to continue its discussion of the eligibility of swing plants producing HCFC-22 and to consider that issue in the context of its discussions of by-product controls of HFC-23 arising from the Kigali Amendment.

China is in the process of completing its stage I HCFC Production Phase-out Management Plan (HPPMP), where its stage I HPPMP progress report indicates a production reduction of at least 5,741 ODP tonnes and an additional reduction of idle capacity; funding has been disbursed at a level of US$ 95 million without support costs (US$ 100.32 million including support costs). China has submitted its stage II HPPMP to the 79th Executive Committee meeting. For this stage II, the Business Plan includes the phase-out of 1,456.2 ODP tonnes in 2017, and a further phase-out of 4,368.60 ODP tonnes in 2018-2020; the funding of those activities in the Business Plan is US$ 21.874 per year (or US$ 20.714 million excluding support costs, i.e. US$ 290 million for the 14-year period 2017-2030). The amount for the period 2018-2020 is then determined at US$ 65.62 million (including support costs).

DPR Korea needs to phase out approximately 9.65 ODP tonnes of HCFC production by 2020. The funding estimated in the Business Plan for this reduction is approximately US$ 1.6 million during the next 2018-2020 triennium (US$ 0.533 million per year, including agency support costs).

The total amount calculated for China and DPR Korea for production phase-out for the period 2018-2020 is estimated at US$ 67.22 million.

Table 4-1 summarises the planned, estimated funding levels as well as the ODP tonnes to be addressed for the two countries, according to the adjusted 2017-2019 MLF Secretariat Consolidated Business Plan.

Table 4-1 Estimated funding levels and the ODP tonnes involved, according to the adjusted 2017-2019 Business Plan (US$ million)

Project and country	**2017**		**2018**		**2019**		**2020**	
	ODP tonnes	(US$ million)	ODP tonnes	(US$ million)	ODP tonnes	(US$ million)	ODP tonnes	(US$ million)
HPMP stage II (PR China)	1456.2	21.874	1456.2	21.874	1456.2	21.874	1456.2	21.874
HPMP stage I (DPR Korea)	0	0	3	0.533	3	0.533	3.65	0.533
Total	1456.2	22.407	**1459.2**	**22.407**	**1459.2**	**22.407**	**1459.85**	**22.407**
Funding 2018-2020								**67.221**

4.2 Further elaboration on production sector issues

In the context of HFC-23 mitigation, it is mentioned in chapter 7 that Argentina, India, Mexico and Venezuela also produce HCFC-22. The facilities involved here are all swing plants and they currently only produce HCFC-22 for emissive uses.

Possible funding estimates for these HCFC-22 producing swing plants will depend on the decisions on guidelines for closure, which may be further discussed during ExCom-79. In accordance to decision 77/64, the Executive Committee continued its discussion of the eligibility of swing plants producing HCFC-22 at its 78th meeting. During those consultations, some countries also raised the issue that the guidelines need to "integrate" the comparison of the closure cost of HCFC-22 and the investment-operational costs for incineration or other means which will address both HFC-23 mitigation and the HCFC-22 phase out. Some Executive Committee members indicated that while swing plants are not eligible under the current guidelines, funding for closure could be provided as a cost-effective mechanism to comply with the HFC-23 compliance obligations under the Kigali Amendment. Whilst it may not involve closure funding for these swing plants in the triennium 2018-2020, it will be likely in later triennia.

4.3 HPPMP stage II for production in China

China submitted it proposed stage II HPPMP to the 79th Executive Committee meeting. In light of the funding approved for stage I, the amount of funding available to phase-out HCFC production in China is US$ 290 million for the period 2017 through the year 2030 (without agency support costs). In case the stage I HPPMP would not be completed in time, the remaining funding of US$ 290 million would have to be distributed over a period starting after 2017, which would result in slightly higher amounts per year than given in section 4.1 above. However, the Task Force has assumed that the US$ 290 million will be divided over the total period 2017-2030 (the first triennium being 2018-2020), with an amount of US$ 21.874 million per year (including support costs), which yields a total of US$ 65.62 million as given in section 4.1 for the 2018-2020 triennium.

5 Funding requirements for non-investment and supporting activities for the 2018-2020 replenishment period and beyond

5.1 Introduction

This chapter considers all non-investment supporting activities (funding requirements for CAP, Core Unit funding for UNDP, UNIDO and the World Bank, the MLF Secretariat and the Executive Committee operating costs and the cost of the Treasurer) in Article 5 countries during 2018-2020; it also includes the funding requirements for HPMP preparation and Institutional Strengthening. The adjusted consolidated business plan of the Multilateral Fund for 2017-2019 after the 77th meeting of the Executive Committee (UNEP/OzL.Pro/ExCom/77/76) served as a basis for the chapter in this report. The chapter also considers estimated funding amounts for the two triennia 2021-2023 and 2024-2026.

Funding for other activities such as ODS destruction projects and technical assistance are not included in this chapter. The last ODS destruction projects were submitted to the 72nd and 73rd meeting of the Executive Committee in the year 2014. No funding requirement was indicated in the adjusted MLF business plan for destruction or for technical assistance activities that fall outside the UNEP Compliance Assistance (CAP) programme.

5.2 Funding requirements for the 2018-2020 triennium

5.2.1 HPMP preparation

For project preparation, the same level of funding is considered as before, consistent with the guidelines adopted by the Executive Committee in decision 71/42 of its 71st meeting[2]. According to the adjusted consolidated 2017-2019 business plan of the MLF, no project preparation fund for stage I HPMP is envisaged past 2017.

Stage II and III HPMPs deal with HCFC reductions steps beyond the 2015 10% reduction (and the 2020 35% reduction) and could incorporate either an accelerated or a total phase-out. Stage II HPMPs will continue to be prepared in the period 2018-2019 and to a much lesser extent after 2020.

A total of US$ 4.35 million including agency support costs is expected to be required for stage II HPMP preparation for the triennium 2018-2020 in 90 countries, to cater for those which have not received stage II preparation funding during the previous triennium. For virtually all LVCs, except those that have already addressed a complete phase-out, project preparation funding for stage II HPMPs will be required in 2018. About 96 % (US$ 4.18 million) of the funding requirement will be in the first year of the next triennium (2018).

The Executive Committee had approved US$ 9.51 million (including support costs) for stage II HPMP preparation before January 2017; it is expected that a total of US$ 4.35 million will be required for HPMP stage II preparation in the next two triennia. This would bring the total for HPMP stage II preparation to US$ 13.86 million.

Assuming the provisions in the guidelines for stage II HPMPs continue to apply, it would be expected that countries in this category would also be requesting funding for preparation of stage III HPMPs around 2018-2019 to meet the 67.5% reduction step by 2025. Nevertheless, the adjusted MLF business plan only indicates a total of US$ 102,000 for HPMP stage III project preparation in 2020 (for Chile, DR Congo and Peru).

[2] UNEP/OzL.Pro/ExCom/71/42

Assuming that project preparation for stage III would be the same as for stage II HPMP, the amount of US$ 4.35 million was allocated for the 2018-2020 triennium (and US$ 9.51 million could be allocated in the 2021-2023 triennium, totaling US$ 13.86 million).

It is expected that most of the activities in stage III HPMPs will address HCFC consumption in the refrigeration servicing sector.

5.2.2 Project preparation requests not linked to HPMPs

Project preparation requests for HFC management plans/national strategies in the 2018-2020 triennium are considered under chapter 6, enabling activities.

5.3 Institutional Strengthening

The funding approved for Institutional Strengthening (IS) support is recognized as a major contribution to the achievement of Article 5 countries' compliance with the Montreal Protocol's control measures.[3] The Executive Committee has so far approved a total of US$ 131 million (with support costs) for IS projects in 145 countries, which represents less than 4 per cent of the total funds approved under the Multilateral Fund[4].

In May 2015, the Executive Committee approved all IS projects and renewals "at a level 28 per cent higher than the historically agreed level, with a minimum level of institutional strengthening funding of US$ 42,500 per year, to continue support for compliance with the Montreal Protocol and to address the challenges related to the phase-out of HCFCs in line with the objectives of decision XIX/6 and the transition to alternatives that minimized environmental impact; and to review institutional strengthening, including funding levels, at the first Executive Committee meeting in 2020" [5]

From the business plan, the funding committed for IS projects in 2017 totals US$ 11.361 million. For the triennium 2018-2020, it amounts to US$ 9.948 million for 2018, US$ 11.181 million for 2019 and US$ 9.948 million for 2020, totaling US$ 31.077 million for the triennium.

The IS projects mentioned above include agency support costs with exception of IS projects that fall under UNEP, that does not receive support cost for IS as it is covered by the CAP agreement.

5.4 HCFC phase-out demonstration projects

In line with decisions 55/43 and 72/40, the Executive Committee approved US$ 27.8 million for HCFC demonstration projects related to application of low-GWP alternative technologies. Fourteen (14) projects were approved from 2009 to 2011, totaling US$ 18,563,739[6] (including agency support costs). At the 72nd meeting in 2014, the Executive Committee considered a document on options for a number of additional projects to demonstrate climate-friendly and energy efficient alternative technologies to HCFCs, including not-in-kind technologies[7]. At its 74th meeting in 2015, the Executive Committee approved one feasibility study and 13 requests for preparation of demonstration projects and at the 75th (2015) and 76th (2016) meetings, the Executive Committee, in response to decision XXV/5 of the Meeting of Parties, approved an additional 18 project proposals to demonstrate low-GWP technologies, at a total funding of US$ 9,284,946 (including agency support costs). These additional proposals for demonstration projects for low-GWP alternatives to HCFCs were considered using specific criteria for project selection.

[3] Paragraphs 11 to 13 of UNEP/OzL.Pro/ExCom/74/51
[4] Paragraph 16 of UNEP/Ozl.Pro/ExCom/78/7
[5] UNEP/Ozl.Pro/ExCom/78/6, Annex I, in line with ExCom Decision 61/43(b)
[6] UNEP/OZL.Pro/ExCom/78/6 Annex III
[7] UNEP/OzL.Pro/ExCom/72/40.

The Replenishment Task Force has rounded up the total cost (to US$ 10 million) of demonstration projects approved in 2015 and 2016, following ExCom decision 72/40. This figure was used as an indicative one for the funding requirement in the 2018-2020 triennium. Given the current uncertainty, a range of US$ 0-10 million was applied in the funding requirement calculation for the next triennium.

For countries aiming at fast tracking the phase-down of HFCs, potential demonstration projects are being considered in chapter 6, "HFC-Phase-down enabling activities", and these should follow as much as possible the eligibility guidelines currently under development by the Executive Committee.

5.5 Supporting activities

This section presents the funding requirements for supporting activities for the 2018-2020 triennium, classified as follows:

(1) UNEP's Compliance Assistance Programme (CAP);

(2) Core Unit funding for Implementing Agencies (UNDP, UNIDO and the World Bank);

(3) Secretariat and Executive Committee; and

(4) Treasurer.

5.5.1 UNEP Compliance Assistance Programme (CAP): personnel costs, clearing-house and information exchange activities

As an Implementing Agency of the Multilateral Fund, UNEP implements clearing-house and information exchange activities such as global information exchange, and is responsible for the regional networking of National Ozone Officers (NOO). The regional networking of NOOs has facilitated the cooperation and information exchange through regional network meetings, workshops and South-South cooperation activities. UNEP also implements institutional strengthening projects for some Article 5 countries, mainly LVCs. UNEP has brought its components "information dissemination", "personnel", "subcontracts", "training", "equipment" and "premises" together in the UNEP CAP.

CAP has been functioning since the beginning of 2003 and has also assisted countries to establish licensing and quota systems, and prevent illegal trade. This assistance is viewed as some of the most effective contributions of the CAP. The Executive Committee at its 77th meeting has requested UNEP to "consider a review of its overall structure and operations with a view to address new challenges and emerging needs, and prepare a report to the 79th meeting.[8]

The UNEP CAP costs for 2018-2020 are budgeted at US$ 34.799 million including 8% agency support cost. This includes annual increases of 3% consistent with the limit specified by the Executive Committee[9] and agency support cost of about 8% where applicable.

These figures do not consider the strengthening of the regional network staff and activities to support NOUs in the development of their institutional framework for future ratification, implementation and compliance of the Kigali Amendment. The ExCom has not yet considered guidelines for such activities which at this stage can be considered as a subset of HFC phasedown enabling activities, funding for which is addressed in section 6.8.

[8] Paragraph 30 of UNEP/Ozl.Pro/ExCom/78/7

[9] The 2014 CAP was approved at the 71st Meeting with an increase for inflation of only 2% but the 3% limit has not at this stage been changed.

5.5.2 Core Unit funding for UNDP, UNIDO and the World Bank

The current administrative cost regime provides for the staffing levels of UNDP, UNIDO and the World Bank to be maintained by core unit funding, which is additional to the agency fees of 7% applied to projects with a cost of above US$ 250,000 (including Institutional Strengthening and project preparation costs) and fees of 9% for projects of US$ 250,000 or below.

Core unit costs for the 2018-2020 triennium have been estimated assuming a 0.7% annual increase according to the current administrative cost regime. Therefore the core unit costs for the three implementing agencies are estimated at US$ 5.905 million for the year 2018 increasing to US$ 5.946 million and US$ 5.988 in 2019 and 2020 respectively. The total funding would then be US$ 17.839 million for the triennium 2018-2020.

5.5.3 Operating costs of the MLF Secretariat and the Executive Committee

The funding required for the operating costs of the MLF Secretariat, including the monitoring and evaluation task and the Executive Committee was determined through consultations with the MLF Secretariat. As in the past, no major change is expected to the level of the operating budget except for a 3% annual increase for the salary component to take into account the annual salary steps payable under the UN administrative system. Thus for the costs of the MLF Secretariat and the Executive Committee an amount of US$ 6.586 million is estimated for the year 2018 increasing to US$ 6.719 million in 2019 and US$ 6.860 million in 2020. This results in a total amount of US$ 20.164 million for the 2018-2020 triennium.

5.5.4 Costs for the Treasurer

As in the previous triennium, the costs for the Treasurer are budgeted at US$ 0.5 million per year for a total funding requirement of US$ 1.5 million for the 2018-2020 triennium.

Table 5-1 Total funding requirement for the triennium 2018-2020 for non-investment and supporting activities (US$ million)

Non-investment and supporting activities	**2018-2020**
Non-investment	
Institutional Strengthening (IS)	31.077
HPMP Preparation	
HPMP stage II PRP costs	4.35
HPMP stage III PRP costs	4.35
HCFC Demonstration Projects	0.0-10.0
Subtotal non-investment activities	*39.777-49.777*
Supporting activities	
UNEP CAP	34.799
Agency Core Unit costs	17.839
Secretariat and ExCom	20.164
Treasurer	1.500
Subtotal supporting activities	*74.302*
Total for non-investment and supporting activities	**114.079-124.079**

5.6 Funding requirements for the 2021-2023 and 2024-2026 triennia

5.6.1 HPMP Preparation during the 2021-2023 triennium

5.6.1(a) Funding requirements for preparation of stage II HPMPs

Data from the business plan of the Multilateral Fund for 2017-2019 served again as a basis for this part of the report. The business plan of agencies indicates that US$ 46,000 would be needed for the preparation of HPMP stage II after 2020. This figure has been used in the report.

5.6.1(b) Funding requirements for preparation of stage III HPMPs

With the assumption that the provisions in the guidelines for stage II HPMPs continue to apply, it could be expected that countries will be requesting funding for preparation of stage III HPMPs around 2018-2019 that are targeted at meeting the 67.5% reduction step by 2025.

Assuming that project preparation for stage III would be the same as for stage II HPMP, the amount of US$ 4.35 million was allocated for the 2018-2020 triennium and US$ 9.51 million allocated in the 2021-2023 triennium, totaling US$ 13.9 million.

Considering the sectors addressed, or planned to be addressed in stage I and stage II HPMPs it can be assumed that most of the activities in stage III HPMPs will address HCFC consumption in the refrigeration servicing sector.

5.6.1 (c) Funding requirements for preparation of stage IV of HPMPs

Countries that complete stage II and III HPMPs would be in the position to request project preparation of stage IV HPMPs to meet 97.5% reduction step in 2030. That request could come in the beginning of the 2024-2026 triennium.

Performance of stages II and III HPMP will determine the need and levels of funding for further stages of HPMP preparation beyond these stages for LVC and non-LVC countries. Thus available information is not adequate to enable forecast of funding requirement for later stages of the HPMPs with any degree of confidence.

Project Preparation (US$ million)	**2021-2023**	**2024-2026**
HPMP stage 1	0.0	0.0
HPMP stage II	0.046	0.0
HPMP stage III	9.51	TBD
Total	**9.56**	TBD

5.7 Institutional Strengthening

The Institutional Strengthening component remains the same every two years if the funding amount is not changed by Executive Committee decisions.

Future estimates 2021-2023 and 2024-2026 will depend on a 2020 revision mentioned in the ExCom Decision 78/6[10]. Since information on this issue is not yet available, it was considered best for this study to mention a range between the IS funding as used in the period before 2020 and a further 28% increase after 2020, as indicative values for the two triennia after 2020.

[10] UNEP/Ozl.Pro/ExCom/78/6, Annex I

Institutional Strengthening (US$ million)	2021-2023	2024-2026
	28.190-36.083	31.077-39.779

5.8 Supporting Activities for the 2021-2023 and 2024-2026 triennia

5.8.1 (a) UNEP Compliance Assistance Programme (CAP)

The indicative allocations for CAP, considering the 3% annual increase and agency support cost of 8% where applicable, and including support costs are as follows (from the 2020 funding determined at US$ 11.944 million): the 2021-2023 indicative allocation is US$ 12.302 million in 2021; US$ 12.671 million in 2022 and US$ 13.051 million in 2023, which yields a total of US$ 38.024 million for the triennium 2021-2023.

The indicative allocation for 2024-2026 is US$ 13.442, US$ 13.845 and US$ 14.260 million in 2024, 2025 and 2026, respectively, totaling US$ 41.547 million for the triennium 2024-2026.

These figures do not include any funding for strengthening of the regional network staff and activities to support NOUs in the development of institutional frameworks for ratification, implementation and compliance of the Kigali Amendment (see Chapter 6).

5.8.2 (b) Agency Core Unit Costs

Core unit costs for the 2021-2023 triennium have been estimated assuming 0.7% annual increase according to the current administrative cost regime. Assuming the present funding arrangement continues, the replenishment for the Agency core unit costs for the three implementing agencies are estimated at US$ 6.030 million in 2021, US$ 6.072 million in 2022 and US$ 6.114 million in 2023, totaling US$ 18.216 million for the three implementing agencies for the 2021-2023 triennium.

For the 2024-2026 triennium, and following the current regime at a 0.7% annual increase, the numbers would be US$ 6.157 million in 2024 (from US$ 6.114 million in 2023); US$ 6.200 million in 2025, and US$ 6.243 million in 2026, totaling US$ 18.600 million for the 2024-2026 triennium.

These figures do not include any funding specifically for the provision of additional IA support to Article 5 countries regarding the phase-down of HFCs while HPMPs are still under implementation.

5.8.3 (c) MLF Executive Committee and secretariat costs

As in the past, costs calculations were done considering that no major change is expected to the level of the operating budget except for a 3% annual increase for the salary component to take into account the annual salary steps payable under the UN administrative system.

Assuming only the 3% increase annually increase (from US$ 6.86 million in 2020, the costs of the MLF Secretariat and the Executive Committee for the 2021-2023 triennium will be US$ 7.066 million in 2021, US$ 7.278 million in 2022 and US$ 7.496 million in 2023, totaling US$ 21.840 million (from US$ 20.164 million in the previous triennium, an 8.3% increase per triennium).

Assuming that for the 2024-2026 triennium the current annual increase of 3% will again be followed, the required funding would be US$ 7.721 million in 2024 (from US$ 7.496 million in 2023), US$ 7.953 million in 2025 and US$ 8.191 million in 2026, totaling US$ 23.865 million.

These figures do not consider funding for any additional meetings or related work to support the Executive Committee's activities related to the Kigali Amendment.

5.8.4 (d) Treasurer costs

The current agreed costs for the treasurer of US$ 500,000 per year are based on a negotiated value between UNEP and the Executive Committee. The Task Force has assumed that the costs will remain the same for the following two triennia. Therefore the amount of US$ 1.5 million per triennium will continue to be budgeted for the treasurer for the two replenishment periods 2021-2023 and 2024-2026.

5.9 Total indicative costs for HCFC phase-out non-investment and supporting activities

The total indicative costs for HCFC phase-out non-investment and supporting activities including the preparation of stages II and III and IV of HPMPs, IS, demonstration projects and supporting activities for the triennia 2021-2023 and 2024-2026 (including support costs where applicable) are presented in Table 5-2. The costs of supporting activities are based upon the current agreed percentage growth for CAP, Core Unit Costs and Secretariat and Executive Committee operating costs, as well as Institutional Strengthening. The costs for the Treasurer for the 2021-2023 and 2024-2026 triennia were considered unchanged.

Table 5-2: Total indicative costs for HCFC phase-out non-investment and supporting activities for the triennia 2021-2023 and 2024-2026 (US$ million)

Non-investment and supporting activities	**2021-2023**	**2024-2026**
Non-investment		
Institutional Strengthening (IS)	28.190-36.083	31.077-39.779
HPMP preparation		
HPMP stage II PRP costs	0.046	0
HPMP stage III PRP costs	9.51	TBD
Subtotal non-investment	*37.746-45.639*	*31.077-39.779*
Supporting activities		
UNEP CAP	38.024	41.547
Agency Core Unit costs	18.216	18.600
Secretariat and ExCom	21.840	23.865
Treasurer	1.500	1.500
Subtotal supporting activities	*79.580*	*85.512*
Total	**117.326-125.219**	**116.589-125.291**

* No funding requirements were indicated in the adjusted 2017-2019 business plan for destruction projects and/ or for technical assistance activities that fall outside the CAP programme.

6 Enabling activities for HFC phase-down for 2018-2020 and beyond

This chapter discusses the "enabling activities," as outlined by Parties, to be funded for HFC phasedown under the Kigali Amendment as adopted in Decision XXVIII/1 at the Twenty-eighth Meeting of the Parties to the Montreal Protocol (UNEP/OzL.Pro.28/12). Because guidelines for financing the phase-down of HFC consumption and production in Article 5 parties have yet to be developed by the Executive Committee, presented for comments to the parties and then finalized by the Executive Committee, this chapter provides a limited discussion of initial, enabling activities for the period 2018-2020 and beyond.

The relevant paragraphs of Decision XXVIII/5, listed explicitly here, are as follows:

> *2. That, in preparing the report…, the Panel should take into account, among other things:*
>
> > *(a) All control measures and relevant decisions agreed upon by the parties to the Montreal Protocol and the Executive Committee of the Multilateral Fund…and the decisions of the Twenty-Eighth Meeting of the Parties and the Executive Committee at its meetings, up to and including its seventy-eighth meeting, insofar as those decisions will necessitate expenditure by the Multilateral Fund during the period 2018–2020;*
> >
> > *(b) The need to allocate resources to enable all parties operating under paragraph 1 of Article 5 of the Montreal Protocol (Article 5 parties) to achieve and/or maintain compliance with Articles 2A–2E, 2G, 2H, 2I and 2J of the Protocol;*
>
> *3. That the Technology and Economic Assessment Panel should provide indicative figures of the resources within the estimated funding required for phasing out HCFCs that could be associated with enabling Article 5 parties to encourage the use of low-GWP or zero-GWP alternatives and indicative figures for any additional resources that would be needed to further encourage the use of low-GWP or zero-GWP alternatives;*
>
> *4. The need for additional resources to enable Article 5 parties to carry out initial activities related to the phase-down of HFCs listed under Annex F and controlled under Article 2J;*

Relevant to paragraph 4 in the above decision is paragraph 20 of Decision XXVIII/2 (see Annex 3; from UNEP/OzL.Pro.28/12), which requests the Executive Committee to include the following enabling activities to be funded in relation to the HFC phase-down:

> (a) Capacity-building and training for the handling of hydrofluorocarbon alternatives in the servicing, manufacturing and production sectors;
>
> (b) Institutional strengthening;
>
> (c) Article 4B licensing;
>
> (d) Reporting;
>
> (e) Demonstration projects; and
>
> (f) Development of national strategies.

Decision XXVIII/2 requested the Executive Committee to develop, within two years of the adoption of the Kigali Amendment, guidelines for financing the phase-down of HFC consumption and production in Article 5 parties, including cost-effectiveness thresholds; review the rules of procedure of the Executive

Committee with a view to building in more flexibility for Article 5 parties; and present the guidelines and the rules to the parties for comments before they were finalized. For the purposes of this report, the RTF defined initial, enabling activities as those outlined above.

6.1 Discussions at the 77th and 78th Executive Committee Meetings on enabling activities

To develop its response to the relevant paragraphs of Decision XXVIII/5 related to enabling activities to support the phasedown of HFCs, members of the TEAP Replenishment Task Force attended the 77th (November 2016) and 78th (April 2017) Meetings of the Executive Committee for the Multilateral Fund and held informal discussions on the margins of those meetings.

At its 77th Meeting, the Executive Committee of the Multilateral Fund discussed a note from Secretariat (UNEP/OzL.Pro/ExCom/77/70/Rev.1), November 2017, which sought guidance from the Executive Committee to address Decision XXVIII/2 (see Annex 3).

At that meeting, the Executive Committee decided to hold a four-day special meeting in early 2017 to address matters related to the Kigali Amendment arising from Decision XXVIII/2 (see Annex 3), and potential additional contributions to the Multilateral Fund (ExCom Decision 77/59). The Secretariat was requested to prepare a document containing preliminary information in response to the elements in Decision XXVIII/2 that requested the Executive Committee to take action addressing five issues as follows:

- available information on HFC consumption and production, as well as on HFC-23 by-product, including from surveys of ODS alternatives funded by the Multilateral Fund and other sources;
- the enabling activities required to assist Article 5 parties in commencing their reporting and regulatory activities in relation to the HFC-control measures;
- key aspects related to HFC-23 by-product-control technologies;
- identification of the issues that the Executive Committee might want to consider in relation to existing HCFC phase-out activities; and
- information relevant to the development of the cost guidelines.

At its 78th Meeting, 4-7 April 2017, the Executive Committee discussed, along with other documents prepared by the Secretariat, the document, "Information relevant to the development of the cost guidelines for the phase-down of HFCs in Article 5 countries: enabling activities" (UNEP/OzL.Pro/ExCom/78/6). The document notes that the activities as listed in paragraph 20 of Decision XXVIII/2 have been historically funded under the Multilateral Fund as stand-alone activities or as a component of sector or national phase-out plans, although not specifically defined using the term "enabling activities." The document goes on to review the relevant decisions and current practices by the parties and the Executive Committee related to the enabling activities as listed in paragraph 20 of Decision XXVIII/2.

Although the Executive Committee held extensive discussions on this and other topics during their meeting, further discussions and possible decisions on cost guidelines for the phase-down of HFCs were deferred to the next ExCom meeting, 3-7 July 2017. As guidelines for financing the phase-down of HFCs are still being discussed and developed by the Executive Committee, the TEAP Task Force relied on the enabling activities as defined by parties in paragraph 4 of Decision XXVIII/2, experience under the MLF in its historical support for these activities (i.e., HPMPs), considers options for funding, and provides an estimate of funding initial, enabling activities for the phase-down of HFCs in the period 2018-2020.

6.2 Capacity-building and training

As outlined in its 78th Meeting document (UNEP/OzL.Pro/ExCom/78/6), the Executive Committee has historically approved funding for capacity building and training for handling alternatives in the

manufacturing and servicing sectors. Early training programmes had been implemented at the country level, as stand-along activities, and, since then, have been incorporated into sector plans (e.g. terminal phase-out management plans (TPMPs) for LVC countries), national phase-out plans (NPPs), and HPMPs. Training programmes have focused on the following:

- Customs and law enforcement officers on Montreal Protocol-related national legislation and regulations, import/export licensing and associated quota systems;
- Refrigeration service technicians on good servicing practices;
- Training as a component of investment projects for the conversion to alternative technologies and/or processes; and
- As part of regional, sector-specific, or global training.

Capacity-building (excluding direct funding support to NOUs, which is considered under the Multilateral Fund as "institutional strengthening") has also been provided at the regional and global levels, mainly through the Compliance Assistance Programme of UNEP. This includes capacity-building for ozone officers and key country stakeholders. Capacity-building and training programmes have been incorporated in the implementation of manufacturing and refrigeration sector projects to address safety issues associated with transition to alternative technologies and/or processes.

For the period 2018-2020, the Task Force considered capacity-building and training for the handling of HFC alternatives in the servicing, manufacturing and production sectors could be initiated if not already a component of HPMP projects. In the refrigeration servicing sector, enabling activities under the MLF have included training programmes for servicing technicians on controlling refrigerant leaks, prevention and maintenance operations; development of code of good refrigeration servicing practices and its incorporation into the curricula of technical schools; establishment of refrigeration associations; and procurement and distribution of basic equipment and tools required in good service practices. As the phase out of controlled substances under the Montreal Protocol progressed, these enabling activities were incorporated into sectoral and national phase out plans including HPMPs. Similar initial, enabling activities relevant to handling of HFC alternatives could be useful for incorporating into national HFC phasedown plans.

6.3 Institutional strengthening

At its 78th Meeting, the Executive Committee discussed the document, "Information relevant to the development of the cost guidelines for the phase-down of HFCs in Article 5 countries: institutional strengthening," (UNEP/OzL.Pro/ExCom/78/7) which reviews the information in an earlier document (UNEP/OzL.Pro/ExCom/74/51) on IS funding history, its linkage to other forms of institutional support and capacity-building provided through project management units (PMUs) in multi-year phase-out plans, and the UNEP's CAP. The document provides updates with regard to the IS activities and challenges related to support for implementation of the Kigali Amendment.

The 78th meeting document on IS provided the following as categories of potential IS support for the phasedown of HFCs:

- Assisting relevant authorities in the ratification of the Kigali Amendments to the Montreal Protocol;
- Adopting and implementing legislation and regulations: controlling and monitoring HFC consumption (and production where applicable); extending import/export licensing and quota systems to monitor and control trade;
- Coordinating the collection, analysis, verification and submission of progress reports on the implementation of country programmes for submission to the Fund Secretariat (by 1 May each year) and data on Annex F consumption and production under Article 7 of the Montreal Protocol to the Ozone Secretariat;

- Strengthening institutional structures to ensure safe use of alternatives including revised standards and codes;
- Consulting and coordinating with national agencies and industry;
- Information and public awareness.

The document also notes that the Executive Committee has also approved funding (that could be related support for IS) in the establishment and maintenance of Project Management Units (PMUs) under national or sector phase-out plans. In the context of HPMPs in non-low volume consuming countries, the PMU is a technical unit responsible for project management and as such is a separate function distinct from the NOU. For LVC countries a distinct PMU does not normally exist and the NOU would undertake the project management of the HPMP. Approximately up to 5 to 10 per cent (for non-LVC countries) and up to 20 per cent (for LVC countries) of the total funding requested for an HPMP may be allocated to the establishment of the PMU, and must be justified in the project proposal as per the guidelines for NPPs. (UNEP/OzL.Pro/ExCom/38/57/Rev.1)

The document notes additional support that could be related to IS at the regional and global levels through the UNEP CAP. The regional location of CAP staff supports information exchange and cooperation among NOUs through regional network meetings, workshops, and cooperative activities. The support provided by CAP to assist countries to develop ODS legislation, establish licensing and quota systems, and prevent illegal trade are viewed as some of the most effective contributions of the CAP. At the 77th meeting the Executive Committee requested UNEP to review the overall structure of the CAP and to consider its operations and regional structure in addressing emerging needs and new challenges, and to submit a final report of that review to the Executive Committee for consideration at its 79th meeting (Decision 77/38(c)).

For the period 2018-2020, the TEAP Task Force considered that IS support could be initiated to support activities that consider and start building the necessary framework for controlling and monitoring HFCs upon ratification of the Kigali Amendment. Activities could include investigating needed changes to national legislation and regulations, import/export licensing and quota systems, and reporting requirements to the Multilateral Fund Secretariat under country programmes and to the Ozone Secretariat under Article 7 of the Montreal Protocol. Other initial activities could support the safe transition to alternatives through revision of relevant national standards and codes. There would also be a need for coordination and consultation with national agencies and industries in potentially affected sectors as well as a general need for improved information dissemination and public awareness. As mentioned above, the Multilateral Fund may provide related IS support through PMUs as a component of HPMPs as well as through UNEP's CAP, so building on these existing funding mechanisms would be cost-effective and serve to avoid duplicative efforts.

6.4 Article 4B licensing

As discussed in the 78th Meeting document (UNEP/OzL.Pro/ExCom/78/6), Article 4B of the Montreal Protocol requires that each Party establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances in Annexes A, B, C and E of the Montreal Protocol. Since the adoption of the Protocol, the parties and the Executive Committee have adopted a series of decisions to fund activities to enable Article 5 countries' compliance with their obligations related to Article 4B. With regard to Article 4B of the Montreal Protocol, the Kigali Amendment inserted the following text after paragraph 2: "Each Party shall, by 1 January 2019 or within three months of the date of entry into force of this paragraph for it, whichever is later, establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances in Annex F. Any Party operating under paragraph 1 of Article 5 that decides it is not in a position to establish and implement such a system by 1 January 2019 may delay taking those actions until 1 January 2021."

In the development of a licensing system for HCFCs, replacement HFCs were not included in the existing Harmonized Commodity Description and Coding System (Harmonized System) developed and maintained by the World Customs Organization, which made it difficult for customs authorities to recognize the illegal nature of the relevant import or export of HCFCs if declared as HFCs. The Twenty sixth Meeting of the Parties (November 2014) therefore requested the Ozone Secretariat to liaise with the World Customs Organization to examine the possibility of designating individual Harmonized System codes for the most commonly traded fluorinated substitutes for HCFCs and CFCs classified under Harmonized System code 2903.39, and encouraged parties to take the necessary steps to recommend such international customs classifications and consider establishing domestic customs codes for the relevant substitutes (Decision XXVI/8).

For the period 2018-2020, the TEAP Task Force considered that initial, enabling activities related to the phasedown of HFCs and specifically to Article 4B licensing could be supported to continue efforts to harmonize international customs classifications and investigate action to establish domestic custom codes for substitutes as appropriate. These efforts and support would also be related to the activities mentioned above related to capacity building and training and IS support to investigate needed changes to legislative and regulatory infrastructure, import/export licensing systems, and reporting under the Montreal Protocol. Article 5 countries that wish to ratify before 2019 would need to establish a licensing system by 2018 in order to satisfy reporting requirements needed after three months of becoming a Party. Article 4B licensing-related training would include providing information to customs officers and other enforcement officers on policies, regulations, import/export licensing and quota systems, and prevention of illegal trade. Funding for enabling activities related to Article 4B for HFCs would need to consider existing funding mechanisms such as capacity-building and training stand-alone activities or related to project implementation as well as through UNEP's CAP, so building on these existing funding mechanisms would be cost-effective and serve to avoid duplicative efforts.

6.5 Reporting

Parties to the Montreal Protocol are required to report under Article 7, data on controlled substances on an annual basis to the Ozone Secretariat. In addition, Article 5 countries are required to report data on controlled substances by sector and subsector under their country programme to the Fund Secretariat. As mentioned above, these reporting activities are supported under the Multilateral Fund through capacity-building and training and IS support. In the period 2018-2020, initial, enabling activities related to reporting could include beginning work to establish a framework, potential procedures, and guidelines for data reporting on HFCs under Article 7 of the Montreal Protocol. Accurate reporting on HFCs will be important to monitoring compliance by parties under the Kigali Amendment. In the period 2018-2020, funding for enabling activities related to reporting on HFCs would need to consider if existing funding mechanisms such as UNEP's CAP provide a basis of support, so building on such existing funding mechanisms would be cost-effective and serve to avoid duplicative efforts.

6.6 Demonstration projects

As discussed in the 78th Meeting document (UNEP/OzL.Pro/ExCom/78/6), the Multilateral Fund has funded demonstration projects, often to facilitate the adoption and/or optimization of cost-effective and available technologies under the local conditions prevailing in Article 5 countries. Since approving the first demonstration project in 1991 for CFC recovery and recycling, the Executive Committee has approved 136 demonstration projects at a total value of US$ 70.9 million (including agency support costs). The Executive Committee has also approved specific funding windows for demonstration projects for the phase-out of methyl bromide, chiller projects, ODS waste management, and low-GWP alternative technologies to HCFCs.

In line with decisions 55/43 and 72/40, the Executive Committee approved US$ 27.8 million for HCFC demonstration projects on low-GWP alternative technologies. Fourteen (14) projects were approved from 2009 to 2011, totaling US$ 18,563,739[11](including agency support costs). At the 72nd meeting in 2014, the Executive Committee considered a document on options for a number of additional projects to demonstrate climate-friendly and energy efficient alternative technologies to HCFCs, including not-in-kind technologies[12]. At its 74th meeting in 2015, the Executive Committee approved one feasibility study and 13 requests for preparation of demonstration projects and at the 75th and 76th meetings, the Executive Committee, in response to decision XXV/5, approved an additional 18 project proposals to demonstrate low-GWP technologies, at a total funding of US$ 9,284,946 (amount including agency support costs). These additional proposals for demonstration projects for low-GWP alternatives to HCFCs were considered using specific criteria for project selection.

6.7 Development of national strategies

Compliance under the Montreal Protocol has been achieved through the development of national strategies for controlled substances. The 78th Meeting of the Executive Committee document (UNEP/OzL.Pro/ExCom/78/6), with further details in Annex IV, notes that national strategies have been the basis for assisting Article 5 countries in phasing out ODS. National strategies include the country programme, first and most important, "[serving] as basis for project preparation and further co-operation between the Party and the implementing agencies…not a funding document per se, but rather…a statement of the overall strategy that an Article 5 country wished to take to phase out ODS." Other relevant national strategies include Refrigeration Management Plans (RMPs) mainly for LVC countries, followed by Terminal Phase-out Management Plans (TPMPs) also mainly for LVC countries. Towards the end of the 2010 compliance-target period for CFCs, performance-based phase-out plans were approved for non-LVC countries to address the remaining consumption of CFCs, mostly used in the refrigeration servicing sector (although several NPPs included the remaining consumption in the manufacturing sector). Activities related to the accelerated phase-out of HCFC production and consumption were addressed through HPMPs.

For the phasedown of HFCs under the Kigali Amendment, a similar approach that takes into account sector use and sets priorities for transition based on the specific circumstances of a party, an HFC phasedown strategy or plan, would consider national policies and regulations to facilitate the phasedown of HFCs and be important to achieving the goals under the Protocol. Similar to ODS phase-out, the HFC phase-down strategy could be integrated into national plans through consultation and coordination with national agencies and industry and other stakeholders. In the period 2018-2020, funding for enabling activities related to national strategies on HFCs would need to consider if existing funding mechanisms such as IS or UNEP's CAP provide an existing basis of support, so building on such existing funding mechanisms would be cost-effective.

6.8 Estimating funding requirement for HFC phasedown enabling activities 2018-2020

As mentioned above, although the Executive Committee held extensive discussions on enabling activities and related funding during their 78th meeting, further discussions and possible decisions on cost guidelines for the phase-down of HFCs were deferred to the next meeting 3-7 July 2017. In the absence of final cost guidelines on HFC enabling activities, the TEAP Task Force considered the following approaches below and provides its estimate for additional resources needed for these activities in the 2018-2020 period.

[11] UNEP/OZL.Pro/ExCom/78/6 Annex III
[12] UNEP/OzL.Pro/ExCom/72/40.

For non-investment enabling activities, the TEAP Task Force considered that an approach to estimate funding for enabling activities may be to consider the total MLF funding for project preparation and demonstration projects related to stage I HPMPs. Over 400 project preparation activities for HCFC phase-out have been funded under the MLF giving a total of US $40,428,465 (including agency support costs) over the period 2008-2016 or an average of about US$ 4,500,000 per year.

The Task Force also considered the document from ExCom-78 (UNEP/OzL.Pro/ExCom/78/10) describing possible funding modalities for enabling activities to be implemented in Article 5 countries based on "recent experiences under the Multilateral Fund for allocating funding following the principle of equity across Article 5 countries and bilateral and implementing agencies." Following its approach at the 55th meeting (July 2008) to review submissions for the preparation of HPMPs while achieving equity across Article 5 countries and agencies, the Secretariat adopted the following criteria:

- The level of HCFC consumption was used as a proxy for estimating the cost of preparing HPMPs, which proved to be a good indicator during the phase-out of CFCs;
- Historical cost data was used as a reference for similar activities, as preparation of HPMPs was similar to the preparation of other national strategies (e.g., country programmes, national/sector phase out plans, and terminal phase-out management plans);
- Funding requests were broken down into components, facilitating the assessment of the cost of specific activities; and
- Article 5 countries were grouped according to their levels of HCFC consumption and their uses (i.e., countries with zero consumption; countries with HCFC-22 consumption only, or with HCFCs only used in the refrigeration servicing sector; and countries with HCFC use in both the manufacturing and the refrigeration servicing sectors).

Based on the analysis conducted by the Secretariat, funding levels for the preparation of HPMPs (excluding investment projects) were US $30,000 for countries with zero consumption of HCFCs; US$ 85,000 for countries with mainly HCFC-22 consumption only in the refrigeration servicing sector; US$ 150,000 for mid-consuming countries with HCFC consumption in the manufacturing and refrigeration servicing sectors; and US$ 195,000 for large-consuming countries with HCFC consumption in the manufacturing and refrigeration servicing sectors. Based on those funding levels, Article 5 countries were able to prepare HPMPs that included: a description of ODS regulations including the licensing system; HCFC consumption data by substance and sector, and the estimated baseline for compliance and starting point for aggregate reduction in HCFC consumption, the HCFC overarching strategy for the period 2013 to 2030 and the strategy and phase-out plan for stage I of the HPMP including specific activities.

The 78th Meeting of the Executive Committee document (UNEP/OzL.Pro/ExCom/78/10) proposed following this similar approach using the following criteria:

- HCFC baseline as an indicator of the effort needed to initiate activities to ratify the Kigali Amendment, noting that actual HFC baselines will be established only in 2023;
- Historical funding levels as a reference for similar enabling activities; and
- Break down the funding requests into components to facilitate the assessment of the cost of each specific activity.

Using HCFC baselines, the indicative levels of funding for enabling activities in Article 5 countries is estimated at a total of US$ 20.154 million.

Based on the above, an estimate for non-investment, enabling activities is provided in the range of US$ 13.5 to US$ 20.2 million for the period 2018-2020.

Investment projects enabling activities

In its Replenishment Task Force report (June 2014), the TEAP Task Force provided an indicative amount for a gradual conversion to low-GWP from ODS considering three possibilities of projects in the refrigeration and air conditioning sector. Two of them are considered here (see Annex 6-1):

a. Second conversion of projects that converted to HFC-134a from CFC-12, with support of the Multilateral Fund in the 1990s (domestic and commercial refrigeration mass production, MAC units mass production)
b. An increase in funding for the conversion of stationary AC projects to enable the use of low-GWP refrigerants only.

In total, the additional amounts involved in the two activities mentioned above would be about US$ 16 million per year over at least two triennia, a total of around US$ 96 million. This value is derived from the value mentioned in the June 2014 report, as a first indicative amount to gradually phase out high-GWP alternatives to ODS. In this way one would address the avoidance of consumption of about 7,000 tonnes of high-GWP alternatives. A value of between US$ 8 and 24 million could be used as an estimate for the triennium 2018-2020 (reflecting a certain amount of approvals and funding in 2018 and 2019).

Table 6-2 Funding for HFC phase-down enabling activities (US$ million)

HFC phase-down enabling activities	**2018-2020**
Non-investment projects (including project preparation and demonstration projects)	13.5-20.2
Investment projects	8.0-24.0
Total	**21.5-44.2**

7 Methodology for determining funding for HFC-23 mitigation as of 2020

7.1 Introduction

In the Kigali Amendment, HFC-23 has been added to the list of controlled (HFC) substances in Annex F, Group II. This Group II has been formed because HFC-23 is thought to fulfil a minor role in HFC consumption for emissive uses, however, it is largely produced in HCFC-22 production processes, where it is produced as a by-product that has often been vented to the atmosphere. It should not be misunderstood however that a certain small production of HFC-23 is used to form blends (such as R-508) which are used (and are essential because of no competitive or alternative refrigerants or blends) in very low temperature freezing equipment, furthermore, it is used in fire protection; both are emissive uses. There might also be some feedstock use for HFC-23.

The larger portion of the HFC-23 vented to the environment comes from the HCFC-22 production processes where HCFC-22 is produced for both emissive uses and for feedstock production. In non-Article 5 production processes the emission of HFC-23 is avoided via mitigation, i.e. the incineration of the by-product gas and the re-use or neutralization of the HF so obtained. The percentage of the HFC-23 formed in the total amount of gas produced (HCFC-022 and HFC-23) is maximum 4%, where this percentage can be reduced by optimising the process and by suitable use of regularly replaced catalysts; percentages in the order of 1.2-1.4% have been given in case of this optimization. Some of this optimisation has been applied in non-Article 5 HCFC-22 production plants, followed by collection and incineration of HFC-23.

Table 7-1 gives an overview of the Article 7 UNEP reported data related to HCFC-22 production during the period 2008-2015 for non-Article 5 and Article 5 feedstock and emissive uses.

HCFC-22 feedstock production in non-Article 5 parties did not decrease during 2008-2015, there has been an increasing trend in Article 5 parties (however, with one exception, which is for the year 2015). Production for emissive uses is decreasing since before the year 2008 in non-Article 5 parties and since the year 2012 in Article 5 parties (with a maximum of almost 412,000 tonnes in 2012).

Table 7-1 Production of HCFC-22 for feedstock and emissive uses in Non-Article 5 and Article 5 parties, period 2008-2015 (UNEP Article 7 reporting) (in this case all Article 5 parties are considered, including the Republic of Korea)

Production of HCFC-22 for feedstock and emissive uses 2008-2015 (metric tonnes)								
Year	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Non-Article 5 emissive	117621	74226	61372	47214	36609	28733	29700	19806
Article 5 emissive	330078	371418	379105	379925	411634	330071	341666	287774
Total emissive	447699	445644	440477	427139	448243	358804	371367	307580
Non-Article 5 feedstock	173957	120824	164588	186190	177301	159496	177178	199576
Article 5 feedstock	170916	173098	221761	263482	261815	323996	330910	293156
Total feedstock	344872	293923	386349	449671	459116	483491	508088	492733

As mentioned, HFC-23 is a by-product in all HCFC-22 production given in Table 7-1. Article 5 production for emissive and feedstock use was about 580 ktonnes in 2015.

Figure 7-1 and 7-2 show feedstock, emissive use and total HCFC-22 production for all parties as well as for Article 5 parties only.

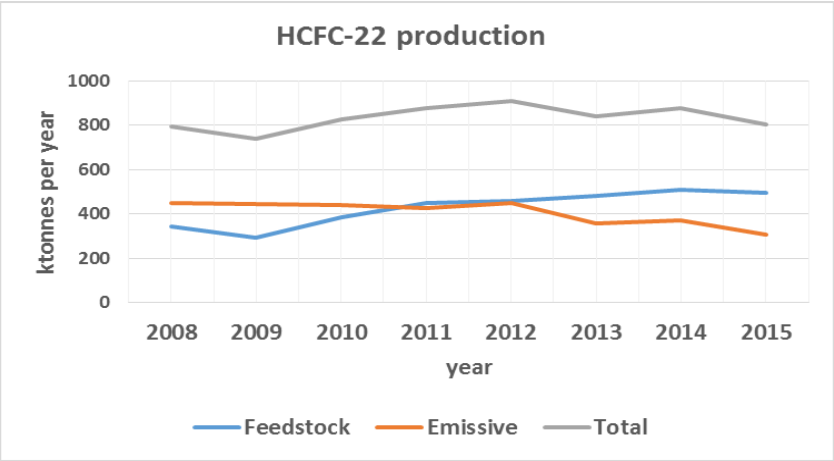

Fig. 7-1 HCFC-22 production for feedstock, emissive uses and total, for 2008-2015, as reported under Article 7 by all non-Article 5 and Article 5 parties

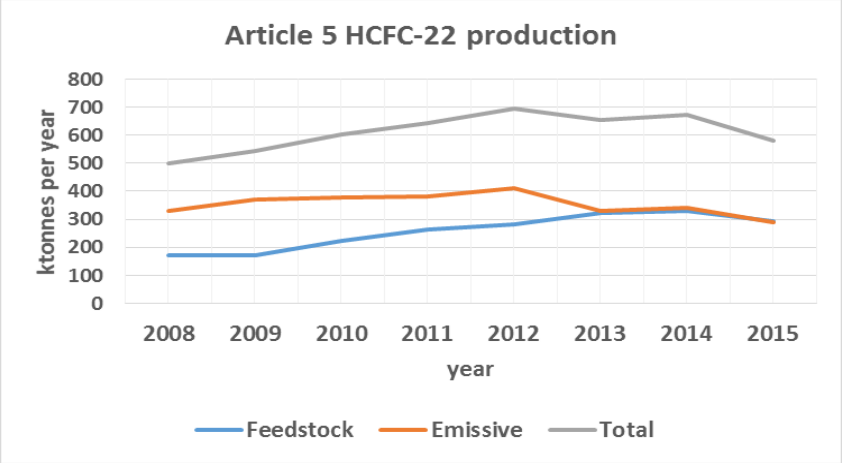

Fig. 7-2 HCFC-22 production for feedstock, emissive uses and total, for 2008-2015, as reported under Article 7 by all Article 5 parties

From Figures 7-1 and 7-2 it can be concluded that emissive use production is clearly decreasing, there is an upward trend for feedstock, however not that much during 2013-2015. The growth in feedstock production is difficult to forecast, it might be smaller than thought in the past, very much related to forecasts for PTFE use. For total HCFC-22 production in Article 5 parties, there may be a certain growth in feedstock production during the next 5 years, but the maximum of the year 2012 is not likely to be achieved. HCFC-22 is also used to make HFC-125 in e.g., China, although alternative production technologies may reduce its competitiveness.

With regard to the HFC-23 substance, the Kigali Amendment stipulates that:

- Each party manufacturing Annex C, Group I, or Annex F substances shall ensure that for the twelve-month period commencing on 1 January 2020, and in each twelve-month period thereafter, its emissions of Annex F, Group II substances generated in each production facility that manufactures Annex C, Group I, or Annex F substances are destroyed to the extent practicable using technology approved by the parties in the same twelve-month period;

- Emissions of Annex F, Group II substances generated in each facility that generates Annex C, Group I, or Annex F substances by including, among other things, amounts emitted from equipment leaks, process vents, and destruction devices, but excluding amounts captured for use, destruction or storage;
- Each Party shall provide to the Secretariat statistical data of its annual emissions of Annex F, Group II controlled substances per facility in accordance with paragraph 1(d) of Article 3 of the Protocol.

In decision XXVIII/2, parties request the Executive Committee to develop guidelines for financing the phase-down of HFC consumption and production. With regard to the production sector, the parties through decision XXVIII/2 requested the Executive Committee to make eligible the costs of reducing emissions of HFC-23, a by-product from the production process of HCFC-22, by reducing its emission rate in the process, destroying it from the off-gas, or by collecting and converting it to other environmentally safe chemicals. Such costs should be funded by the Multilateral Fund to meet the obligations of Article 5 parties. A further analysis of the expected mitigation and associated cost scenarios is given in sections 7.2 and 7.3.

The guidelines concerning the production of HFCs and all issues related to this production have first been discussed in April 2017 at ExCom-78. Final guidance where it concerns the funding of capital and operating costs for mitigation of HFC-23 is not yet clear, however, a range for the funding that would be required in the next triennium can be determined. In particular, it is noted that the control obligations related to HFC-23 are the earliest control obligations under the Kigali Amendment.

Paragraph 41 in ExCom document 77/70 for the ExCom-77 meeting in December 2016 mentions a number of issues related to HFC-23 mitigation. A document covering the key aspects related to HFC-23 was subsequently developed by the Secretariat and was published in March 2017 as UNEP/OzL.Pro/ExCom/78/9 (“Key aspects related to HFC-23 by-product control technologies”).

7.2 HFC-23 by-product production

A number of details on HFC-23 production and mitigation and how it has been dealt with in past years can be found in the Appendix to this chapter.

Table 7-2 Level of HFC-23 estimated in 2015 and destruction facilities in Article 5 countries (from ExCom 78/9)

Country	HCFC-22 production *(mt/year)	HFC-23 generation		HCFC-22 production lines				
		(mt/year)	Rate (%)	Number	With CDM project	With destruction facility	With recovery system	Without destruction facility
Argentina	**2,446**	73	3.00	1	1	0	0	0
China	**534,928**	13,602	2.54	32	14	16	1**	1
DPR Korea	**498**	15	3.00	1	0	0	0	1
India	**53,314**	1,674	3.14	5 (or 6)***	5	0	0	0
Mexico	**4,729**	115	2.44	2	1	0	0	1
BR Venezuela	**677**	20	3.00	1	0	0	0	1
Total	**596,591**	**15,499**		**42**	**21**	**16**	**1**	**4**

The ExCom 78/9 document gives HCFC-22 production data reported under Article 7 for 2015 for six Article 5 countries, namely Argentina, China, Democratic People's Republic of Korea, India, Mexico, and Bolivarian Republic of Venezuela, and concludes that they manufactured almost 600 ktonnes of HCFC-22 for controlled emissive and feedstock uses. That document estimates the total amount of HFC-23 generated at 15,499 tonnes (see table below, reproduced from the ExCom document).

Of the six Article 5 countries that reported HCFC-22 production under Article 7 (see above), only China has an approved HPPMP. The issue of the eligibility funding the closure of swing plants continues to be under discussion at ExCom level. Given the present guidelines (except for the DPR Korea), the Article 5 producing countries are not eligible to receive funding from the Multilateral Fund for closure of HCFC-22 (swing) plants. The following can be mentioned for the various countries:

7.2.1 Argentina

Data given mention that the HFC-23 generated in Argentina is about 3% of the HCFC-22 amount produced. It is being vented, where it was reported previously as vented under the CDM.

7.2.2 China

Table 7-3 Amounts of HCFC-22 produced in 2015 in various HCFC-22 production plants, as well as the HFC-23 amounts stored and/or incinerated in 2015. The information is available from the Chinese NRDC at NDRC at: http://qhs.ndrc.gov.cn/gzdt/201605/t20160527_805072.html

Producer	HCFC-22 prod. (ktonnes)	HFC-23 prod. (tonnes)	Incinerated HFC-23 (tonnes)	Comment
Shandong Dongyue Chemical Co	173.3	3614	1059	182 tonnes stored, two new incinerators completed late 2015
Zhengjiang Quhua Co	49.2	1441	1055	376 tonnes stored, new incinerator completed in December 2015
Jiangsu Meilan	63.9	1827	1418	
3F Changsu	40.9	1180	1180	
ZhongHao ChenGuang	17.2	474	466	
Linhai Limin Chemical (Zhejiang)	17.5	353	615	HFC-23 stored in the past included
Shandong ZhongFu	N/A	N/A	N/A	Data not available
Arkema Changshu (Jiangsu)	30.7	576	576	
Zhejiang Sanmei Chemical	14.4	368	0	350 tonnes sold, 18 tonnes stored, incinerator compl. April 2016
Jinhua Yonghe (Zhejiang)	12.0	240	0	165 tonnes sold, incinerator completed in March 2016
Zhejiang Lanxi Juhua	20.6	618	0	144 tonnes sold, 44 tonnes stored, incinerator compl. March 2016
Jiangxi YingGuang Chemical	0.0	0.0	0	Incinerator under construction
Jiangxi Sanmei Chemical	14.0	350	0	194 tonnes sold, 41 tonnes stored, without incinerator constr. plan
Sichuan Zigong Honghe Chemical	N/A	N/A	N/A	Data not available
Zhejiang Pengyou Chemical	10.0	270	0	Incinerator completed in April 2016
Totals	**463.7**	**11311**	**6369**	

China has a large number of HCFC-22 producing plants, of which a number of plants in operation for at least three years before 2004 were qualified for and equipped under the CDM with incineration units that incinerated part -- or the whole of the HFC-23 generated. In 2008, any new HCFC-22 lines built for use as a refrigerant were required by the Chinese government to have the capability to address HFC-23 and any new HCFC-22 production units for feedstock are required to destroy HFC-23 without subsidies related to capital investment or operating costs.

Table 7-3 gives 15 Chinese HCFC-22 production plants, of which 9 plants have an annual output between 0 and 40 ktonnes, 3 between 40 and 80 ktonnes; one has an annual output in the range of 150-200 ktonnes of HCFC-22. For two plants data are not available. Specific production data are given in the table, with a known total of 463.7 ktonnes. This is less than in the ExCom 78/9 table, because certain plant production lines are not reported (the amount in the ExCom 78/9 may also be overestimated; it may well be 22 ktonnes lower for 2015).

Article 7 reporting of HCFC-22 for emissive use and feedstock production by China amounts to about 514 ktonnes in 2015 (there is a difference of about 50 ktonnes with the amount mentioned in Table 7-2; 50 ktonnes may well have been produced in the two plants for which no data are available in Table 7-2). Based on the data in table 7-3, HFC-23 waste generation rates ranged from 2.9 to 1.9 per cent, with an average of 2.4 per cent; this is comparable to the data reported in ExCom 78/9, which indicated HFC-23 waste generation rates between 3.03 and 1.78 per cent for 29 production lines in 13 production facilities, with an average of 2.54 per cent.

With the support of the Government, the construction of 13 HFC-23 destruction facilities at 15 HCFC-22 production lines not covered by the CDM was started in 2014. The Government also has committed to subsidise the operating costs during the period 2014-2019 to encourage the operation of destruction facilities. The CDM lines have been in operation since their start up. Once all new destruction facilities are completed, 30 out of 32 production lines will be equipped with a destruction (incineration) facility. It is estimated that 45 per cent of the HFC-23 generated was destroyed in 2015; 10 per cent was collected, sold or stored for use; and 45 per cent was emitted. For 2016, a percentage between 60 and 70 is estimated for destruction; the collection cannot be estimated.

7.2.3 Mexico

In Mexico, HFC-23 by-product from HCFC-22 production is partially emitted (and/or separated for a specific use), or destroyed. One destruction facility attached to one Quimibasicos plant (CDM project from 2006) was operated in 2015. The other plant (where it is not clear where it is located and whether the same destruction facility could be used for the HFC-23 amount generated here) is venting HFC-23 to the atmosphere. A HFC-23 waste generation of 2.44% has been reported.

7.2.4 India

In India, 5 HCFC-22 production facilities have implemented a CDM project, of which two are still in operation (until April 2017 and October 2018). Once the CDM projects will expire for the production facilities, a newly issued order by the Indian Government specifies that the destruction facilities continue to be operated. It is not clear whether that would mean that operating costs would be eligible under the Multilateral Fund. For the funding requirement calculated in this report it has been assumed that they would.

There may also be a sixth facility in India (not taken into consideration) producing HCFC-22 for feedstock.

7.2.5 Other Article 5 parties

The HCFC-22 production facilities in the DPR Korea and the Bolivarian Republic of Venezuela (one each) have never had a CDM project and did never build destruction facilities. It can therefore be assumed that HFC-23 is vented at those two facilities at a 3% level of the HCFC-22 production. There is also production in the Republic of Korea but this has not been further considered here.

7.3 HFC-23 by incineration; investment and operating costs

It will be difficult to give accurate numbers for future years, i.e., after the year 2020 (the first year in the Kigali Amendment), for capital and operating costs for HFC-23 mitigation.

This because:

- It is unclear what the HCFC-22 total production will be in the year 2020 and the years beyond, which very much depend on the increase (decrease) in production for feedstock, if any;
- It may be useful for certain existing plants to consider collection of HFC-23 rather than continuous destruction in an integrated system and transport to an incineration facility on- or off-site, however, costs for this operation are unknown as capital investment to improve the ability to collect HFC-23 may be needed to reduce emissions rates;
- It is unclear whether and when certain Article 5 production plants would consider closure, if they would become eligible for closure funds under the Protocol;
- Costs for investments for and operating costs of an incineration (thermal decomposition) plant vary widely;
- Neutralization and disposal costs or income generated by the acid waste stream will vary depending on local markets and the ultimate fate of the acid;
- Reduced HFC-23 generation through optimisation could further reduce operating costs for incineration and neutralisation.

An estimate of capital and operational costs is therefore given on the basis of the HFC destruction plants installed and the HFC-23 generated in 2015. This implies that it would concern 3 destruction facilities, and furthermore transport costs of HFC-23 to a destruction facility for two small production plants, as well as about 15.5 ktonnes HFC-23 generated per year (based on 575 ktonnes of HCFC-22).

Process optimisation is normally done to minimize the HFC-23 emissions; this is related to temperature, pressure, feed rates, catalyst concentration and catalyst renewal, where the latter is a very important factor in the production of HFC-23 as a percentage of HCFC-22. Non-Article 5 country producers are assumed to all have implemented either process optimization and/or thermal destruction to mitigate HFC-23 emissions. Process optimization will reduce generation rates to below 1.6 per cent of HCFC-22 production, but may require modifications to existing equipment and capital expenditure, as well as additional operating costs.

A report on an optimization project in China implemented under the stage I HPPMP is expected at the 79th Executive Committee meeting. Specifically, implementation of the HPPMP for China includes technical assistance related to HFC-23 by-product control, and in particular an investigation on the mechanisms and technical feasibility of reducing the HFC-23 production ratio in HCFC-22 production through best practices. This technical assistance intends to reduce the HFC-23 by-product ratio through policy and technical measures.

The USEPA (global mitigation report of 2013) estimated the costs for installing and operating a thermal oxidizer with a technical lifetime of 20 years: capital cost is estimated to be approximately US$ 4.8 million to install at an existing plant and US$ 3.7 million to install as part of constructing a new plant,

operating and maintenance costs are approximately 2.0 to 3.0 per cent of total capital costs. Based on these assumptions, operating costs would be approximately US$ 0.22/kg (following ExCom document 78/9). Values in this range, even somewhat higher, have been mentioned in discussions with manufacturers in non-Article 5 parties. Higher estimates have been given by others sources consulted, varying between incremental capital costs of US$ 2-10 million for plants with a HCFC-22 production capacity of 10-50 ktonnes of HCFC-22 (China CDM report, IPCC-TEAP, 2005, manufacturers data) and as high as US$ 6/kg (see ExCom document 78/9).

Based on the ranges given, this study estimates the cost of a new incinerator for existing facilities at US$ 250,000-500,000 per year (based on a 20 years lifetime).

For the operating costs, a "best estimate" range of US$ 0.5-1.5 per kg has been derived[13]. In this amount the costs for possible optimization of the process before HFC-23 mitigation would be included.

The above would imply (see above) a funding of US$ 0.75-1.5 million for one year for three new facilities. For the operational costs (for 15.5 ktonnes of HFC-23 as mentioned in Table 8-2) a range of US$ 7.75-23.3 million would apply. This amount takes into account all operating costs for all Article 5 parties with HCFC-22 production, including those where subsidy programs are currently applied (PR China) or where an order (or regulation) to mitigate HFC-23 emission has entered into force (India).

To this amount the possible costs for the mitigation of 35 tonnes of HFC-23 from the facilities in DPR Korea and Venezuela would have to be added, but this is assumed to be small compared to the numbers mentioned for the range above. Costs for transport and incineration elsewhere could be assumed at US$ 2.5 per kg, which would bring the total to US$ 87,000 per year.

However, it may not be correct to consider the same HCFC-22 production amounts for emissive uses and for feedstock. One could assume that the emissive use production would decrease by 25% between 2015 and 2020 (the Montreal Protocol mandated reduction) and that feedstock production would increase by 10% based on the 2015 production. Since both amounts are comparable in the case of Article 5 countries it would mean that the operational costs would be lower in 2020, where the range of US$ 6.4-19.1 million can be determined (from the range of US$ 7.75-23.3 million above). Together with the annual investment costs as well as transport and incineration costs this would yield a total of US$ 7.2-20.7 million for HFC-23 mitigation.

In order to prepare for operation of a few facilities (not in operation) to incinerate HFC-23, enabling activities at a value of US$ 0.8 million are estimated.

Table 7-4 Funding for HFC-23 mitigation activities for the triennium 2018-2020 (US$ million)

HFC-23 mitigation	**2018-2020**
Enabling activities before 2020	0.8
Capital and operating costs (year 2020 only)	7.2-20.7
Total	**8.0-21.5**

[13] Based upon estimates from various studies, data from the ExCom 78/9 document, and information on investments and operational costs from several HCFC-22 manufacturers

Appendix to Chapter 7

From the publication by Montzka (2010), one can take the following:

"HFC-23 (CHF3) is a potent greenhouse gas with a global warming potential (GWP) of 14,800 for a 100-year time horizon, that is an unavoidable by-product of HCFC-22 (CHClF2) production. HFC-23 is a relatively long-lived trace gas with a tropospheric lifetime of about 260–270 years…… The production of HCFC-22 for use as feedstock, however, is unrestricted. These two latter aspects of HCFC-22 production regulation have implications for the future production of the by-product HFC-23.

In contrast to the widespread industrial uses of HCFC-22, HFC-23 has limited industrial uses. These include use as feedstock in Halon-1301 (CBrF3) production (nondispersive), in semiconductor fabrication (mostly non-dispersive), in very low temperature (VLT) refrigeration (dispersive) and in specialty fire suppressant systems (dispersive). Thus the bulk of the co-produced HFC-23 was historically considered a waste gas that has been and often continues to be vented to the atmosphere. Since the 1990s, some HCFC-22 producers in the developed countries have voluntarily reduced HFC-23 emissions by process optimization and/or incineration. Based on historical trends, McCulloch in 2004 concluded that "approximately half of the HFC-23 co-produced with HCFC-22 in the developed world is abated". Under the Clean Development Mechanism (CDM) of the United Nations Framework Convention on Climate Change (UNFCCC) 19 HCFC-22 production plants in five developing countries were approved for participation as CDM projects. These countries have reportedly incinerated the HFC-23 co-produced during 2007–2008 from 43-48% of the developing world's HCFC-22 production (Montzka, 2010). Typical HFC-23/HCFC-22 co-production ratios, often referred to as the waste gas generation ratio "w", range from 0.014 in optimized processes to upwards of about 0.04. This co-production relationship of HFC-23 and HCFC-22 provides a unique constraint in evaluating their emission and production trends as HFC-23 may act as a tracer of HCFC-22 production while the fate of HCFC-22 involves a more convoluted path of various end-uses and different release rates. To the extent that HCFC-22 production, waste gas generation ratio and HFC-23 incineration are known, a bottom-up emission history for HFC-23 can be derived. This is not subject of this section, however, has been important in deriving emissions from atmospheric abundance measurements.

To investigate the response of HFC-23 emissions to HCFC-22 production and recent HFC-23 emission abatement measures, a bottom-up HFC-23 emission history was constructed for comparison with our top-down HFC-23 emission history. The bottom-up history relies on HCFC-22 data provided by UNEP up to 2008, on HFC-23 data provided by UNFCCC for developed countries emissions to 2008, on CDM HFC-23 incineration monitoring reports for 2003-2009 and on annual HFC-23/HCFC-22 co-production ratios for developing countries deduced from these CDM reports. The top down versus bottom-up HFC-23 emission history comparison shows agreement within stated uncertainties for all years, with particularly close agreement during 1995-2005. The bottom-up history shows small, statistically insignificant departures to lower values in 2006 and 2008. Overall, this level of agreement supports a reasonable confidence in the HFC-23 emission data reported to the UNFCCC for developed countries and for HFC-23 incineration data reported by CDM projects, and for data reported to UNEP under Article 7 of the Montreal Protocol. In the 1990s, HFC-23 emissions from developed countries dominated all other factors controlling emissions, and thereafter they began to decline to an eventual six-year plateau. From the beginning of that plateau, the major factor controlling the annual dynamics of global HFC-23 emissions became the historical rise of HCFC-22 production for dispersive uses in developing countries to a peak in 2007. But incineration via CDM projects became a larger component during 2007-2009, reducing global HFC-23 emissions despite both a high HCFC-22 dispersive production and a rapidly rising feedstock production, both in the developing world. In the near future, the controlling factor determining whether

there is resurgence or continued decline in HFC-23 emissions may be the extent to which incineration can keep pace to counteract potential growth in feedstock production."

This was the result of investigations reported up to 2010[14]. At that stage the future of any CDM project related to HFC-23 incineration was uncertain based upon the discussions that had started in 2006 within the UNFCCC framework. A further publication by Miller and Kuijpers (2011) investigated future global scenarios for HFC-23 abundances in the atmosphere, dependent on assumed CDM supported mitigation, feedstock production growth and emissive use production phase-down in Article 5 parties (Miller and Kuijpers, 2011). Fang (2014) published a study, which specifically develops HFC-23 emission scenarios through 2050 for China.

However, in the period 2010-2016 various developments have taken place where it concerns HFC-23 mitigation activities in various Article 5 parties. In the early versions of the approved baseline and monitoring methodology "Decomposition of fluoroform (HFC-23) waste streams" under the CDM, the waste generation rate was capped at 3.0 per cent. The most recent version of the methodology uses a waste generation rate of 1 per cent. Information provided in ExCom document 78/9 mentions that "one producer in the United States of America has developed technology that could improve the yield of HCFC-22, reduce the HFC-23 by-product generation rate to as low as 1.0 percent, and improve the collection efficiency of HFC-23 that is generated".

[14] In 2009 the MLF Secretariat had described the situation with regards to CERs, carbon credits via Certified Emission Reductions in UNEP/OzL.Pro/ExCom/57/62 (February 2009), Summary of Information publicly available on relevant elements of the operation of the Clean Development Mechanism and the amounts of HCFC-22 production available for credits

8 Total funding requirement for the triennium 2018-2020

The total funding requirement for the 2018-2020 triennium can be calculated by adding the following components:

- Funding for HCFC consumption phase-out activities: existing commitments from stage I and stage II HPMPs and new (planned) activities for stage II and later stage HPMPs;
- Funding for HCFC production phase-out;
- Funding for non-investment components and supporting activities;
- Funding for HFC phase-down enabling activities; and
- Funding for HFC-23 mitigation activities.

This report has calculated the total funding requirement for approved stage I and II HPMPs for both non-LVCs and LVCs. By considering a 15% uncertainty in the planned activities at about US$ 96 million it created a first funding range. The lower value of the range considers all the HPMP activities and 85% of the funding calculated for planned activities, the higher value of the range considers all agreed HPMP activities and a 15% increase of the funding calculated for planned activities.

A substantial increase of the funding requirement can be determined if planned HPMP activities during 2018-2020 would be somewhat more expensive than planned, namely, if the 2020 planned HPMP stage III (China) would be approved for the year 2020, if the enabling activities would include a meaningful amount of demonstration (investment) projects and if HFC-23 mitigation projects would be funded at a level that is more than a minimum and would apply to all Article countries that have incineration plants in operation.

The estimated **total funding requirement** for the replenishment of the Multilateral Fund for the next triennium 2018-2020 is presented in Table 8-1 below.

Table 8-1 Total funding requirement for the replenishment of the MLF 2018-2020 (US$ million)

Total requirement for replenishment of the Multilateral Fund	**2018-2020**
HPMP	391.91-491.85
HCFC Production	67.22
Non-investment and supporting activities	114.08-124.08
HFC phase-down enabling activities	21.5-44.2
HFC-23 mitigation	8.0-21.5
Total	**602.71-748.85**

9 Indicative funding requirements for 2021-2023 and 2024-2026

9.1 Introduction

In case of the funding for the triennia beyond 2018-2020, the following assumptions and considerations are taken into account for estimating the funding requirement.

1. Funding obligations as a consequence of agreements at ExCom level until 2017.
2. Non-LVC funding: Funding obligations for non-LVCs after 2020, to be calculated from the remaining ODP tonnes for non-LVCs, subtracting the multinational part and part of the servicing that can be assumed to be part of multinational on-site assembly of equipment.
3. LVC funding: (a) remaining tranches for the LVC HPMPs stage II that will normally start in 2019-2020 (to reach the control target of 67.5% reduction from baseline by January 2025); (b) furthermore, funding for LVCs for HPMPs stages III, which goes from 67.5% baseline reduction to the full phase-out.
4. Production sector phase-out funding, which is, in fact, for China and DPR Korea as producing countries only (as long as no further "swing plant closure" decisions have been taken).
5. Non-investment costs, following a trend which can be assumed to continue from the one described for the triennium 2018-2020.
6. HFC Phase-down Management Plans, plus HFC conversion investment projects for which funding can be assumed to start in 2021, but where guidelines from the ExCom are lacking.

9.2 HPMPs

Table 9-1 Amounts in ODP tonnes approved in the period 2009-2016, or planned to be approved in the period 2017-2020, plus the total amounts for the (entire) period 2009-2020. Cost effectiveness values are given for the two separate periods (with approved and planned HPMP activities) as well as for the entire period 2009-2020. As can be seen, the cost effectiveness for the planned activities is 50% higher than for the approved activities in 2009-2020.

Period	Amounts (ODP tonnes)	Funding (US$ million)	Cost-effectiveness (US$/ODP-kg)
2009-2016	19463.9	1340.31	68.86
2017-2020	1105.9	110.79	100.19
Total 2009-2020	20569.8	1451.11	70.55

The following observations apply for non-LVCs:

1. US$ 147.96 million has already been agreed for HPMP activities during the 2021-2023 triennium, and US$ 82.20 million for HPMP activities during the 2024-2026 triennium (i.e., the sum of the annual amounts 2021-2026, given in Tables 2-1 and 2-2).
2. In principle, 59.5% of the baseline in ODP tonnes has been approved through 2016 (including at ExCom-77) for a total funding of US$ 1,340.31 million. For the year 2017 and the triennium 2018-2020, this report has estimated and determined a funding amount for planned activities of US$ 110.79 million. This implies that the percentage ODP tonnes funded to a 62.9% baseline reduction for non-LVCs, and 37.1% baseline reduction of ODP tonnes still to be funded to reach the total phase-out target. Assuming the same overall cost effectiveness as for the 59.5% (in tonnes reduction) that has been approved for funding, one can calculate an amount of US$ 835.72 million, which would have to be funded through (or before) the year 2029. The funding disbursements that could be decided for the entire period through 2029 are not yet certain, of course.

3. Assuming that there would be 15% multinational ownership in the manufacturing operations (these multinational operations would already have been converted by now), and that there would be 5% multinational ownership in the servicing (on-site installation of equipment) operations, the amount mentioned under point (2) would be reduced from US$ 835.7 to US$ 752.1 million.
4. One could discriminate between two possible scenarios: *Scenario (a)* - 45% of the total amount will be funded in the two triennia considered here (2021-2023 and 2024-2026), 10% would be for the triennium 2027-2029. This would yield an amount of US$ 338.5 million for the first two triennia. *Scenario (b)* - 33.3% of the total funding would apply to each of the three triennia until 2029. This would imply a HCFC HPMP funding of US$ 250.7 million per triennium.
5. Based on the above in (4), it would be logical to consider a range of US 250.7-338.5 million for HPMP (stage II (still to be approved), stage III and further) activities in the consumption sector. This would then be for the two triennia after 2018-2020 (see Table 9-2 below).
6. It has been noted earlier (in the chapter on the total funding requirement for 2018-2020) that US$ 196.13 million has been announced for China by implementing agencies in the 2017-2019 business plan. China is supposed to use this for its stage III HPMP (it would concern 1335 ODP tonnes, this is at a cost effectiveness of US$ 146.913 per ODP kg, substantially higher than the values used for future years (2017-2020) from table 8-1 above). This amount has not been further considered here for future triennia, and the ODP tonnes to be phased out in China are assumed to be part of the funding mentioned in point (5). The amounts given in the business plan will not be further commented to in this chapter.

The following observations apply for LVCs:

1. For LVCs an amount of US$ 650,000 has been agreed for the 2021-2023 triennium, and an amount of US$ 740,000 for the 2024-2026 triennium.
2. For all LVC countries, a funding amount has been agreed through the year 2016 at US$ 43.73 million which would roughly cover 35-40% of their consumption (including a total phase-out for a small number of LVCs). Assuming that another 35% will be funded in the period 2020-2023, and that about US$ 10 million for these (LVC) HPMPs stage II has already been planned (and put in the 2018-2020 requirement) for the year 2020, one could determine an amount of about US$ 30 million for the triennium 2021-2023 (and the year 2024) to achieve a reduction of at least 67.5% of the baseline.
3. It is difficult to make a funding assumption for the period 2024-2026, but the amount would be in the order of US$ 20 million for a complete phase-out before the year 2030 (via a number of tranches to be paid after 2016).

9.3 HCFC production

As mentioned in section 4.1, production phase-out funding is expected to be US$ 65.6 million per triennium through 2030, following the HPPMP stage II China production plan (not including production phase-out funding for DPR Korea after 2020), per triennium (fixed amounts per year). No further swing plant closure funding has been taken into account in this amount here.

9.4 HFC-23 mitigation

The amount calculated in chapter 7 was US$ 7.2-20.7 million for the year 2020 (the investment costs per year plus the operational costs). This amount is assumed to apply to all three years in the two future triennia, which implies that US$ 21.6-62.1 million would be required per triennium.

9.5 Non-investment costs

On the basis of the numbers given in chapter 5, ranges can be calculated for the triennium 2021-2023 and for the triennium 2024-2026, caused by uncertainty in future Institutional Strengthening funding, which will be based on future decisions of the Executive Committee.

9.6 Funding for HFC phase-down plans

Because there are no guidelines yet available, the funding requirements for HFC phase down remain uncertain and therefore could not be included in the estimated costs for the next two triennia following the period 2018-2020.

9.7 Total funding for the next two triennia

Table 9-2 Indicative estimates for the funding requirements for the replenishment of the Multilateral Fund for the triennia 2021-2023 and 2024-2026 (US$ million)

Funding requirement	**2021-2023**	**2024-2026**
Non-LVCs HPMPs, agreed	148.0	82.2
Non-LVCs, HCFC phase-out activities planned after 2020	250.7-338.5	250.7-338.5
LVCs, HPMPs agreed	0.65	0.74
LVCs, HCFC phase-out activities planned after 2020	30.0	10.0-20.0
HCFC production phase-out (China)	65.6	65.6
Non-investment and supporting activities funding (including HPMP and HFC project preparation activities)	117.3-125.2	116.6-125.3
Demonstration projects (for HFC phase-down)*	TBD	TBD
Investment projects for HFC phase-down*	TBD	TBD
HFC-23 mitigation**	21.6-62.1	21.6-62.1
Subtotal	**634.8-771.0**	**548.5-695.5**

* The amount for HFC phase-down projects for the two triennia has been filled in as "TBD", lacking further guidance for HFC phase-down projects.
** This assumes that the HFC-23 mitigation funding (as determined for 2020, minus the enabling activities) would continue during each year after 2020

Table 9-2 presents the funding estimates for the various parts as well as the indicative total funding requirement for the next two triennia. A funding range of US$ 634.8-771.0 million is calculated for the triennium 2021-2023 and a range of US$ 548.5-695.5 million for the triennium 2024-2026. Because there are no guidelines available, the funding requirements for HFC phase-down cannot be included, they will be updated when necessary and when the guidelines will be available.

10 References

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Annex 1 HCFC reported production and consumption – various numbers for the four groups of Article 5 countries

This Annex 1 contains the following tables:

Table A1-0 HCFC total consumption in the four groups for Article 5 countries in ODP tonnes, 2009-2015, plus the baselines for the four groups

Table A1-1 HCFC production levels 2009-2015 per HCFC chemical in metric tonnes, totals for Non-Article 5 and Article 5 countries, the share of production in 2011-2015 of the baseline production levels for Article 5 countries.

Table A1-2 HCFC production levels 2009-2015 per HCFC chemical in ODP tonnes, totals for Non-Article 5 and Article 5 countries, the share of production in 2011-2015 of the baseline production levels for Article 5 countries.

Table A1-3 HCFC consumption levels 2009-2015 per HCFC chemical in metric tonnes, totals for Non-Article 5 and Article 5 countries, the share of consumption in 2011-2015 of the baseline consumption levels for Article 5 countries.A1-2

Table A1-4 HCFC consumption levels 2009-2015 per HCFC chemical in ODP tonnes, totals for Non-Article 5 and Article 5 countries, the share of consumption in 2011-2015 of the baseline consumption levels for Article 5 countries.A1-4

Table A1-5 Difference between HCFC production and consumption levels 2009-2015 per HCFC chemical in metric tonnes, for Non-Article 5 and Article 5 countries.

Table A1-6 Difference between HCFC production and consumption levels 2009-2015 per HCFC chemical in metric tonnes, for all countries (globally).

Table A1-7 Total HCFC consumption levels 2009-2015 in ODP tonnes for all Article 5 countries, the baseline for the various countries in ODP tonnes, the contribution of each baseline quantity of countries to the total and the share of the baseline (ODP tonnes) per party in the total. Article 5 countries are split in 4 groups, Group 1 China, Group 2-3 remaining non LVC countries, Group 4, LVC countries

Table A1-8 Total HCFC consumption levels for 2009-2010 (baseline) and for 2015 in ODP tonnes for all Article 5 countries, the contribution of each quantity per party to the total (baseline and 2015 consumption) and the share of the baseline and the 2015 total HCFC consumption per party in the total. Article 5 countries are split in 4 groups, Group 1 China, Group 2-3 remaining non LVC countries, Group 4, LVC countries

Table A1-9 HCFC baseline consumption levels for the non LVC countries, percentages in the total, as well as percentage funding and ODP tonnes approved per party in total (see other tables in Annex to Chapter 2) (total funding approved including Croatia and Region ASP equals US$ 1,384,044,113)

Table A1-3 gives the results of the Article 7 data reporting to UNEP for HCFC consumption.

A few observations from this table:

- Generally, in non-Article 5 countries the consumption of the separate HCFC chemicals deceases. However, while there is some uncertainty whether there is any decease for HCFC-124, it is clear that the consumption of HCFC-123 does not decrease over the period 2009-2015;

- While consumption levels in non-Article 5 countries decrease, and exports and destruction levels increase in a relative sense, many more negative values are reported by countries for separate chemicals. It therefore becomes more and more difficult to derive real consumption trends (some more information on this aspect is given in the Annex);

- There is virtually no negative reporting by Article 5 countries;

- In Article 5 countries, HCFC consumption of the important HCFCs (HCFC-141b, HCFC-142b, HCFC-22) generally increases until 2012, then decreases substantially as of the year 2013;

- In principle the aggregated HCFC consumption compared to baseline should be analysed in ODP tonnes (see Annex). However, a first analysis can be done on the basis of metric tonnes for Article 5 countries. Compared to the baseline in metric tonnes, the consumption increases to 104.7% in 2011, to 112.3% in 2012, then, in 2013, it decreases to 83.3% (an almost 30% decrease between 2012 and 2013). The HCFC consumption in 2014 does not decrease compared to 2013, however, consumption decreases by another 12% in 2015 (compared to 2014);

- The same trend (only small differences in percentages increase or decrease) can be observed for only HCFC-22 in most Article 5 countries during the period 2011-2015.

Table A1-7 gives the HCFC consumption in ODP tonnes for the non-LVC Article 5 countries. For this study, the non-LVCs have been subdivided in 3 groups, following decreasing baseline HCFC consumption in ODP tonnes. Group 1 consists of one party, Group 2 of 33 countries (baseline consumption larger than 59 ODP tonnes) and Group 3 of 23 countries (baseline consumption larger than 360 tonnes, as per the definition for non-LVC countries).

A few observations from this table as well:

- Group 1 represents 58.4% of total ODP tonnes baseline consumption, Group 2 represents 38.5% of the baseline consumption and Group 3 (these are still non-LVC countries with a consumption larger than 360 tonnes) (only) represents 2.3% of the baseline consumption;
- In fact, the first 11 non-LVC countries represent 85% of total Article 5 HCFC consumption;
- All LVC countries together represent 0.8% of the total HCFC (ODP tonnes) baseline consumption;
- The HCFC consumption in Group 1 decreases from 2012 to 2013, increases (5%) in 2014, then decreases again in the year 2015. HCFC consumption in Groups 2 and 3 decrease between 2012 and 2013 (by about 30%), then decrease further in the years 2014 and 2015 (by 4-7% between the separate years, dependent on the year and the specific group of non-LVC countries);
- Where the decrease between 2012 and 2013 may be due to stockpiling effects, it is unclear in how far the decrease in consumption after 2013 is related to the implementation of HPMP stage I plans, where funding for this stage I HPMP plans started in 2010.

In the analysis in this report, the various non LVC countries have been analysed where it concerns the different amounts of approved phase-down, the related funding and funding requirements, the subdivision in 3 groups has only been used for some further grouping of results, not for any analysis per group.

HCFC consumption in ODP tonnes in the four country groups for the years 2009-2015 is given in Table A1-0 below. The total consumption in group 2 is of the same order of magnitude as the consumption in Group 1. In both groups the decrease in consumption was about 35% between 2012 and 2015. The consumption in the groups 3 and 4 (with group 4 having all LVC countries) is again of the same order of magnitude, however, more than a factor 20-30 lower than the consumption in group 1 or 2. Also in these groups, the consumption decreased by a factor of 35-40% between 2012 and 2015.

Table A1-0 HCFC total consumption in the four Article 5 country groups in ODP tonnes, 2009-2015, plus the baselines for the four groups

Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**Baseline**
Group 1	18602.7	19935.3	20739.0	21091.2	15761.3	16838.5	13485.2	19269.0
Group 2	12287.8	13096.7	12205.7	13845.3	10073.5	9556.4	8616.3	12692.3
Group 3	765.4	750.1	731.8	772.1	545.2	525.3	487.6	757.8
Group 4	457.7	465.9	474.9	477.5	360.3	332.2	310.1	461.8
Total	32113.6	34248.1	34151.1	36186.1	26740.3	27252.5	22899.2	33180.8
Realative to baseline		1	1.029	1.091	0.806	0.821	0.690	1

In the Annex further below one can find all HCFC production and consumption tables in metric tonnes, as well as HCFC consumption tables in ODP tonnes, for all non-LVC and LVC countries. It also gives a table with further information on funding amounts approved in principle for all non-LVC countries (and their percentages in the total) as well as ODP tonnes approved for them, this in comparison to their respective baseline consumption levels.

Table A1-1 HCFC production levels 2009-2015 per HCFC chemical in metric tonnes, totals for Non-Article 5 and Article 5 parties, the share of production in 2011-2015 of the baseline production levels for Article 5 parties.

HCFCs Calculated PRODUCTION (metric tonnes)

Status		AnxGp	SubstName	ODP	2009	2010	2011	2012	2013	2014	2015
NA5	Total	CI	HCFC-123**	0,02	3450,8	2171,2	2368,1	2449,5	2222,1	3767,5	2439,3
NA5	Total	CI	HCFC-124**	0,022	3241,3	492,9	1680,5	1014,2	321,4	412,8	371,0
NA5	Total	CI	HCFC-141B**	0,11	10436,2	7471,4	6180,2	3721,6	5297,5	4762,4	3354,9
NA5	Total	CI	HCFC-142B**	0,065	6033,1	1336,5	864,6	679,7	4,6	85,0	20,2
NA5	Total	CI	HCFC-21	0,04	34,8	202,7	213,5	277,5	215,3	232,7	5,0
NA5	Total	CI	HCFC-22	0,055	74225,8	61372,1	47213,6	36609,0	28733,2	29700,1	19806,4
NA5	Total	CI	HCFC-225CA**	0,025	503,3	714,4	445,6	119,6	190,9	500,0	440,9
NA5	Total	CI	HCFC-225CB**	0,033	615,1	800,0	898,0	1156,0	1258,5	655,6	590,8
A5	Total	CI	HCFC-123**	0,02	2238,1	2819,2	3082,8	1687,2	2077,9	1930,6	1750,4
A5	Total	CI	HCFC-124**	0,022	473,9	401,0	232,6	221,3	208,6	315,3	76,3
A5	Total	CI	HCFC-141B**	0,11	91879,9	98857,1	111922,3	117131,3	87123,9	86910,9	65876,9
A5	Total	CI	HCFC-142B**	0,065	24889,7	30449,2	27073,8	22159,3	16954,5	16566,1	18835,6
A5	Total	CI	HCFC-22	0,055	371418,2	379104,8	379925,0	411634,1	330071,0	341666,5	287773,9
TOTAL											
NA5					98540,4	74561,1	59864,2	46027,1	38243,5	40116,1	27028,6
TOTAL											
A5					490899,8	511631,3	522236,5	552833,1	436435,9	447389,3	374313,1

A5	Baseline production		Part of that baseline production				
Baseline (tonnes) & relative level after 2010	501265,5		1,042	1,103	0,871	0,893	0,747

A5	2009-10 prod HCFC-22		Part of that 2009-2010 HCFC-22 production				
"Baseline" (HCFC-22) & relative level after 2010	375261,5		1,012	1,097	0,880	0,910	0,767

Table A1-2 HCFC production levels 2009-2015 per HCFC chemical in ODP tonnes, totals for Non-Article 5 and Article 5 parties, the share of production in 2011-2015 of the baseline production levels for Article 5 parties.

HCFCs Calculated PRODUCTION (ODP tonnes)

Status		AnxGp	SubstName	ODP	2009	2010	2011	2012	2013	2014	2015
NA5	Total	CI	HCFC-123**	0,02	69,0	43,4	47,4	49,0	44,4	75,4	48,8
NA5	Total	CI	HCFC-124**	0,022	71,3	10,8	37,0	22,3	7,1	9,1	8,2
NA5	Total	CI	HCFC-141B**	0,11	1148,0	821,8	679,8	409,4	582,7	523,9	369,0
NA5	Total	CI	HCFC-142B**	0,065	392,2	86,9	56,2	44,2	0,3	5,5	1,3
NA5	Total	CI	HCFC-21	0,04	1,4	8,1	8,5	11,1	8,6	9,3	0,2
NA5	Total	CI	HCFC-22	0,055	4082,4	3375,5	2596,7	2013,5	1580,3	1633,5	1089,4
NA5	Total	CI	HCFC-225CA**	0,025	12,6	17,9	11,1	3,0	4,8	12,5	11,0
NA5	Total	CI	HCFC-225CB**	0,033	20,3	26,4	29,6	38,1	41,5	21,6	19,5
A5	Total	CI	HCFC-123**	0,02	44,8	56,4	61,7	33,7	41,6	38,6	35,0
A5	Total	CI	HCFC-124**	0,022	10,4	8,8	5,1	4,9	4,6	6,9	1,7
A5	Total	CI	HCFC-141B**	0,11	10106,8	10874,3	12311,5	12884,4	9583,6	9560,2	7246,5
A5	Total	CI	HCFC-142B**	0,065	1617,8	1979,2	1759,8	1440,4	1102,0	1076,8	1224,3
A5	Total	CI	HCFC-22	0,055	20428,0	20850,8	20895,9	22639,9	18153,9	18791,7	15827,6
TOTAL											
NA5					5797,1	4390,8	3466,4	2590,6	2269,8	2290,8	1547,4
TOTAL											
A5					32207,8	33769,4	35033,9	37003,3	28885,7	29474,2	24335,0

A5	Baseline production		Part of that baseline production				
Baseline (ODP-t) & relative level after 2010	32988,6		1,062	1,122	0,876	0,893	0,738

A5	2009-10 prod HCFC-22		Part of that 2009-2010 HCFC-22 production				
"Baseline" (HCFC-22) & relative level after 2010	20639,4		1,012	1,097	0,880	0,910	0,767

Table A1-3 HCFC consumption levels 2009-2015 per HCFC chemical in metric tonnes, totals for Non-Article 5 and Article 5 parties, the share of consumption in 2011-2015 of the baseline consumption levels for Article 5 parties.

HCFCs Calculated CONSUMPTION (metric tonnes)

Status		AnxGp	SubstName	ODP	2009	2010	2011	2012	2013	2014	2015
NA5	Total	CI	HCFC-123**	0,02	1214,6	732,2	1254,8	1334,9	1382,2	971,8	1272,3
NA5	Total	CI	HCFC-124**	0,022	1227,6	251,2	1369,0	693,9	147,3	281,9	255,3
NA5	Total	CI	HCFC-141B**	0,11	7287,0	1911,3	3633,5	2083,1	2507,7	1399,5	478,9
NA5	Total	CI	HCFC-142B**	0,065	4829,3	541,5	376,5	244,3	116,2	126,5	-39,7
NA5	Total	CI	HCFC-21	0,04	38,6	206,3	216,9	280,0	217,4	233,1	5,0
NA5	Total	CI	HCFC-22	0,055	96059,8	64874,8	61375,4	41400,9	42822,9	38324,7	18357,6
NA5	Total	CI	HCFC-225CA**	0,025	452,6	609,6	389,1	107,3	215,6	432,2	393,6
NA5	Total	CI	HCFC-225CB**	0,033	505,0	702,1	810,0	936,7	1175,0	577,1	532,6
A5	Total	CI	HCFC-123**	0,02	2163,5	2556,2	2606,9	3345,3	2919,1	3370,6	2764,8
A5	Total	CI	HCFC-124**	0,022	1497,6	1043,9	897,3	543,4	301,1	391,0	684,4
A5	Total	CI	HCFC-141B**	0,11	103418,1	112805,1	122998,1	122820,9	90904,0	89586,7	69117,0
A5	Total	CI	HCFC-142B**	0,065	33783,0	32456,9	30288,2	24932,4	16120,2	15413,5	18030,1
A5	Total	CI	HCFC-22	0,055	381670,7	409155,1	390101,4	435154,7	330677,0	341338,4	296092,5
A5	Total	CI	HCFC-225	0,07	54,9	5,8	42,3	73,1	37,4	57,9	49,4
A5	Total	CI	HCFC-225CA**	0,025	57,9	82,8	82,5	31,0	56,7	66,3	4,4
A5	Total	CI	HCFC-225CB**	0,033	19,3	23,1	16,7	33,0	14,6	21,0	16,9
TOTAL											
NA5					111614,6	69828,9	69425,1	47081,0	48584,3	42346,9	21255,5
TOTAL											
A5					522665,1	558128,9	547033,5	586933,9	441030,1	450245,3	386759,4

A5	Baseline consumption		Part of that baseline consumption				
Baseline (tonnes) & relative level after 2010	540397,0		1,012	1,086	0,816	0,833	0,716

A5	2009-10 cons HCFC-22		Part of that 2009-2010 HCFC-22 consumption				
"Baseline" (HCFC-22) & relative level after 2010	395412,9		0,987	1,101	0,836	0,863	0,749

Table A1-4 HCFC consumption levels 2009-2015 per HCFC chemical in ODP tonnes, totals for Non-Article 5 and Article 5 parties, the share of consumption in 2011-2015 of the baseline consumption levels for Article 5 parties.

HCFCs Calculated CONSUMPTION (ODP tonnes)

Status		AnxGp	SubstName	ODP	2009	2010	2011	2012	2013	2014	2015
NA5	Total	CI	HCFC-123**	0,02	24,3	14,6	25,1	26,7	27,6	19,4	25,4
NA5	Total	CI	HCFC-124**	0,022	27,0	5,5	30,1	15,3	3,2	6,2	5,6
NA5	Total	CI	HCFC-141B**	0,11	801,6	210,2	399,7	229,1	275,9	153,9	52,7
NA5	Total	CI	HCFC-142B**	0,065	313,9	35,2	24,5	15,9	7,6	8,2	-2,6
NA5	Total	CI	HCFC-21	0,04	1,5	8,3	8,7	11,2	8,7	9,3	0,2
NA5	Total	CI	HCFC-22	0,055	5283,3	3568,1	3375,6	2277,0	2355,3	2107,9	1009,7
NA5	Total	CI	HCFC-225CA**	0,025	11,3	15,2	9,7	2,7	5,4	10,8	9,8
NA5	Total	CI	HCFC-225CB**	0,033	16,7	23,2	26,7	30,9	38,8	19,0	17,6
A5	Total	CI	HCFC-123**	0,02	43,3	51,1	52,1	66,9	58,4	67,4	55,3
A5	Total	CI	HCFC-124**	0,022	32,9	23,0	19,7	12,0	6,6	8,6	15,1
A5	Total	CI	HCFC-141B**	0,11	11376,0	12408,6	13529,8	13510,3	9999,4	9854,5	7602,9
A5	Total	CI	HCFC-142B**	0,065	2195,9	2109,7	1968,7	1620,6	1047,8	1001,9	1172,0
A5	Total	CI	HCFC-22	0,055	20991,9	22503,5	21455,6	23933,5	18187,2	18773,6	16285,1
A5	Total	CI	HCFC-225	0,07	3,8	0,4	3,0	5,1	2,6	4,1	3,5
A5	Total	CI	HCFC-225CA**	0,025	1,4	2,1	2,1	0,8	1,4	1,7	0,1
A5	Total	CI	HCFC-225CB**	0,033	0,6	0,8	0,6	1,1	0,5	0,7	0,6
TOTAL											
NA5					6479,6	3880,4	3900,1	2608,8	2722,4	2334,8	1118,4
TOTAL											
A5					34645,9	37099,1	37031,6	39150,3	29304,0	29712,4	25134,4

A5	Baseline consumption		Part of that baseline consumption				
Baseline (ODP-t) & relative level after 2010	35872,5		1,032	1,091	0,817	0,828	0,701

A5	2009-10 cons HCFC-22		Part of that 2009-2010 HCFC-22 consumption				
"Baseline" (HCFC-22) & relative level after 2010	21747,7		0,987	1,101	0,836	0,863	0,749

Table A1-5 Difference between HCFC production and consumption levels 2009-2015 per HCFC chemical in metric tonnes, for Non-Article 5 and Article 5 parties.

HCFCs Calculated PRODUCTION minus CONSUMPTION (metric tonnes) for NA5 and A5										
Status		SubstName	ODP	2009	2010	2011	2012	2013	2014	2015
NA5	Total	HCFC-123**	0,02	2236,1	1439,0	1113,3	1114,6	839,9	2795,7	1167,0
NA5	Total	HCFC-124**	0,022	2013,7	241,7	311,5	320,3	174,1	130,9	115,7
NA5	Total	HCFC-141B**	0,11	3149,2	5560,1	2546,8	1638,6	2789,7	3362,9	2876,0
NA5	Total	HCFC-142B**	0,065	1203,8	795,0	488,1	435,4	-111,6	-41,5	60,0
NA5	Total	HCFC-21	0,04	-3,8	-3,6	-3,4	-2,5	-2,1	-0,5	0,0
NA5	Total	HCFC-22	0,055	-21834,1	-3502,6	-14161,8	-4791,8	-14089,7	-8624,6	1448,9
NA5	Total	HCFC-225CA**	0,025	50,7	104,7	56,5	12,4	-24,7	67,8	47,3
NA5	Total	HCFC-225CB**	0,033	110,1	97,9	88,0	219,2	83,5	78,5	58,2
A5	Total	HCFC-123**	0,02	74,5	263,0	475,9	-1658,1	-841,3	-1440,0	-1014,4
A5	Total	HCFC-124**	0,022	-1023,7	-642,9	-664,7	-322,1	-92,4	-75,7	-608,1
A5	Total	HCFC-141B**	0,11	-11538,3	-13948,1	-11075,8	-5689,6	-3780,1	-2675,8	-3240,1
A5	Total	HCFC-142B**	0,065	-8893,2	-2007,7	-3214,4	-2773,2	834,3	1152,5	805,5
A5	Total	HCFC-22	0,055	-10252,5	-30050,3	-10176,4	-23520,7	-606,0	328,1	-8318,6
A5	Total	HCFC-225	0,07	54,9	5,8	42,3	73,1	37,4	57,9	49,4
A5	Total	HCFC-225CA**	0,025	-57,9	-82,8	-82,5	-31,0	-56,7	-66,3	-4,4
A5	Total	HCFC-225CB**	0,033	-19,3	-23,1	-16,7	-33,0	-14,6	-21,0	-16,9

Table A1-6 Difference between HCFC production and consumption levels 2009-2015 per HCFC chemical in metric tonnes, for all parties (globally).

TOTAL (GLOBAL) PRODUCTION minus CONSUMPTION (metric tonnes)									
	SubstName	**ODP**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total	**HCFC-123**	0,02	**2310,7**	**1702,0**	**1589,2**	**-543,6**	**-1,4**	**1355,7**	**152,6**
Total	**HCFC-124**	0,022	**990,0**	**-401,2**	**-353,1**	**-1,8**	**81,7**	**55,2**	**-492,3**
Total	**HCFC-141B**	0,11	**-8389,1**	**-8388,0**	**-8529,0**	**-4051,0**	**-990,3**	**687,1**	**-364,1**
Total	**HCFC-142B**	0,065	**-7689,5**	**-1212,7**	**-2726,3**	**-2337,8**	**722,7**	**1111,0**	**865,5**
Total	**HCFC-21**	0,04	**-3,8**	**-3,6**	**-3,4**	**-2,5**	**-2,1**	**-0,5**	**0,0**
Total	**HCFC-22**	0,055	**-32086,6**	**-33552,9**	**-24338,3**	**-28312,5**	**-14695,7**	**-8296,5**	**-6869,7**
Total	**HCFC-225CA**	0,025	**-7,2**	**21,9**	**-25,9**	**-18,7**	**-81,4**	**1,5**	**42,9**
Total	**HCFC-225CB**	0,033	**90,8**	**74,8**	**71,3**	**186,2**	**68,9**	**57,5**	**41,3**

HCFCs Calculated Consumption in ODP Tonnes											
Number	**CntryName**	**2009 MT**	**2010 MT**	**2011 MT**	**2012 MT**	**2013 MT**	**2014 MT**	**2015 MT**	**Base**	**Total cons.**	**Share total**
GROUP 1											
1	China	18602,65	19935,34	20739,03	21091,21	15761,32	16838,53	13485,21	**19269,00**	**19269,00**	**0,581**
Value compared to baseline for group				**1,08**	**1,09**	**0,82**	**0,87**	**0,70**			
GROUP 2											
2	India	1598,73	1617,61	1484,57	1653,85	975,94	906,57	992,54	1608,17	20877,17	0,629
3	Saudi Arabia	1362,01	1575,38	1750,76	1921,69	1433,73	1376,63	1305,45	1468,70	22345,86	0,673
4	Brazil	1415,47	1238,98	1046,40	1387,87	1189,25	1164,74	1025,81	1327,22	23673,09	0,713
5	Mexico	1125,92	1171,75	1083,40	1103,98	779,13	723,53	652,58	1148,84	24821,92	0,748
6	Thailand	826,58	1028,45	811,34	1154,64	863,32	864,45	773,50	927,52	25749,44	0,776
7	Turkey	609,94	493,03	427,73	318,18	147,02	123,82	17,95	551,48	26300,92	0,793
8	Malaysia	494,04	537,47	482,30	736,90	445,83	463,40	418,50	515,75	26816,68	0,808
9	Kuwait	398,11	439,09	397,75	420,15	414,67	336,17	338,98	418,60	27235,27	0,821
10	Indonesia	374,85	433,00	337,50	329,38	310,52	257,98	152,67	403,92	27639,20	0,833
11	Argentina	326,15	475,19	511,56	571,39	246,20	276,09	295,42	400,67	28039,87	0,845
12	Egypt	396,60	375,94	355,58	513,78	297,00	320,29	343,12	386,27	28426,13	0,857
13	Iran (Islamic R	362,10	398,77	376,88	376,31	357,44	342,14	309,28	380,43	28806,57	0,868
14	South Africa	339,18	400,13	301,55	345,64	288,84	238,58	208,28	369,65	29176,22	0,879
15	Nigeria	321,39	368,37	402,32	453,40	334,46	304,11	177,92	344,88	29521,10	0,890
16	Pakistan	239,80	254,98	276,05	326,23	247,02	239,79	203,13	247,39	29768,49	0,897
17	Colombia	209,67	241,47	217,40	285,50	176,65	156,03	164,60	225,57	29994,06	0,904
18	Viet Nam	207,48	234,93	223,27	199,93	202,85	210,82	192,70	221,21	30215,26	0,911
19	Philippines	194,71	221,97	164,89	195,65	136,69	149,42	123,26	208,34	30423,60	0,917
20	Venezuela (B	216,23	197,65	165,07	246,14	134,77	104,63	45,72	206,94	30630,54	0,923
21	Yemen	157,79	158,59	71,88	101,94	116,16	101,85	0,00	158,19	30788,73	0,928
22	Syrian Arab R	147,22	122,82	176,57	83,18	28,03	20,99	46,74	135,02	30923,76	0,932
23	Libya	97,47	139,26	131,89	144,10	144,00	122,40	119,81	118,37	31042,12	0,936
24	Iraq	110,96	105,83	110,44	112,20	101,75	96,83	93,39	108,39	31150,52	0,939
25	Cameroon	104,23	73,39	73,78	73,78	82,34	68,26	67,24	88,81	31239,33	0,941
26	Chile	75,21	99,80	109,01	105,78	75,99	74,23	67,63	87,50	31326,83	0,944
27	Qatar	79,75	94,11	96,61	93,57	80,70	84,95	65,89	86,93	31413,76	0,947
28	Jordan	70,90	95,05	101,31	124,85	59,40	59,72	73,99	82,97	31496,73	0,949
29	Lebanon	58,41	88,64	92,26	94,67	72,61	69,69	65,86	73,52	31570,25	0,951
30	Bangladesh	67,75	77,54	88,42	66,47	64,89	59,37	64,18	72,64	31642,89	0,954
31	Korea, DPR	53,35	79,79	74,90	74,22	75,67	66,78	61,67	66,57	31709,46	0,956
32	Congo, DR	55,82	76,60	56,93	47,85	35,94	16,50	15,40	66,21	31775,68	0,958
33	Côte d'Ivoire	61,67	65,91	59,32	56,65	54,20	52,89	51,33	63,79	31839,46	0,960
34	Algeria	60,35	63,88	67,32	56,56	51,07	53,66	53,43	62,12	31901,58	0,961
35	Morocco	67,97	51,38	78,80	68,84	49,41	49,10	28,36	59,68	31961,26	0,963
	SUM	12287,77	13096,75	12205,75	13845,26	10073,49	9556,42	8616,34	12692,26		
Value compared to baseline for group				**0,96**	**1,09**	**0,79**	**0,75**	**0,68**			
GROUP 3											
36	Ghana	77,33	37,17	30,71	27,19	25,39	23,34	20,41	57,25	32018,50	0,965
37	Sudan	50,60	54,73	55,00	58,91	51,24	52,70	46,79	52,66	32071,17	0,967
38	Kenya	54,73	49,57	48,62	42,35	29,14	24,80	20,60	52,15	32123,32	0,968
39	Bahrain	45,08	58,73	57,32	75,59	49,60	49,14	45,98	51,90	32175,22	0,970
40	Dominican Re	48,48	55,11	50,11	40,87	34,78	36,90	43,39	51,80	32227,02	0,971
41	Trinidad and T	38,01	53,94	34,24	88,50	39,50	26,55	12,64	45,97	32272,99	0,973
42	Somalia	44,88	45,27	45,20	17,63	16,46	16,42	15,92	45,08	32318,06	0,974
43	Tunisia	44,28	37,03	33,90	32,69	32,11	34,50	35,57	40,66	32358,72	0,975
44	Senegal	34,76	37,54	36,14	36,14	7,70	20,68	20,63	36,15	32394,87	0,976
45	Oman	30,73	32,20	34,82	54,95	28,87	20,37	22,30	31,47	32426,33	0,977
46	Gabon	29,75	30,64	45,95	30,25	28,60	26,40	19,25	30,19	32456,53	0,978
47	Burkina Faso	26,73	31,03	27,93	26,59	14,88	12,38	11,99	28,88	32485,41	0,979
48	Peru	27,26	26,45	32,50	26,98	25,81	22,01	22,82	26,86	32512,26	0,980
49	Madagascar	32,99	16,83	16,50	15,95	15,95	15,29	14,03	24,91	32537,17	0,981
50	Panama	24,95	24,58	23,89	32,77	21,37	19,22	17,53	24,77	32561,94	0,981
51	Benin	23,62	23,96	23,75	23,30	22,15	20,03	19,28	23,79	32585,72	0,982
52	Afghanistan	22,19	24,86	24,04	17,34	17,70	20,46	20,24	23,53	32609,25	0,983
53	Ecuador	25,74	21,24	32,28	33,76	22,03	21,48	20,10	23,49	32632,74	0,983
54	Uruguay	21,96	24,71	17,62	28,05	15,47	17,80	15,78	23,34	32656,08	0,984
55	Guinea	21,77	23,45	24,53	22,20	7,08	6,89	5,65	22,61	32678,69	0,985
56	Mauritania	20,35	20,46	17,60	20,35	20,35	20,08	20,08	20,41	32699,09	0,985
57	Togo	19,25	20,63	19,14	19,80	18,98	17,88	16,61	19,94	32719,03	0,986
	SUM	765,44	750,11	731,77	772,14	545,15	525,32	487,58	757,78		
Value compared to baseline for group				**0,97**	**1,03**	**0,72**	**0,70**	**0,65**			

GROUP 4												
58	Honduras	17,81	21,99	22,56	24,11	18,94	13,18	10,85	19,90	32738,94	0,987
59	Paraguay	15,09	20,91	16,81	29,30	16,45	17,83	15,99	18,00	32756,93	0,987
60	Zimbabw e	17,08	18,50	19,82	16,20	15,76	13,32	14,16	17,79	32774,73	0,988
61	Cuba	11,70	22,07	14,26	14,90	12,19	13,80	13,41	16,88	32791,61	0,988
62	Jamaica	18,24	14,40	4,54	6,30	2,63	3,03	2,92	16,32	32807,93	0,989
63	Chad	26,02	6,18	17,00	16,50	15,20	14,62	14,20	16,10	32824,02	0,989
64	Niger	15,95	15,99	15,92	15,33	14,61	14,32	13,02	15,97	32839,99	0,990
65	Angola	19,25	12,65	11,55	6,60	15,43	13,21	13,78	15,95	32855,94	0,990
66	Mali	14,43	15,52	17,60	16,61	10,29	10,18	10,12	14,97	32870,92	0,991
67	Cambodia	17,11	12,83	13,71	10,12	9,47	11,19	11,69	14,97	32885,89	0,991
68	Costa Rica	14,20	13,97	21,75	23,00	12,60	12,63	10,96	14,08	32899,97	0,992
69	Sri Lanka	13,42	14,30	16,33	18,02	13,37	12,89	10,31	13,86	32913,83	0,992
70	Central Africa	11,88	12,09	12,02	11,83	11,50	11,06	10,45	11,99	32925,82	0,992
71	El Salvador	11,87	11,49	9,55	9,32	8,08	8,54	5,82	11,68	32937,50	0,993
72	Botsw ana	11,01	11,01	10,89	10,84	10,84	10,51	9,75	11,01	32948,51	0,993
73	Malaw i	8,56	13,04	12,71	12,54	10,18	9,35	8,91	10,80	32959,31	0,993
74	Congo	9,68	10,60	10,56	9,87	9,35	8,72	8,15	10,14	32969,45	0,994
75	Mozambique	8,68	8,68	8,40	8,17	8,25	7,15	7,15	8,68	32978,12	0,994
76	Fiji	7,63	9,19	14,46	14,37	7,67	6,70	3,87	8,41	32986,53	0,994
77	Namibia	6,03	10,71	9,95	4,76	7,02	3,64	5,36	8,37	32994,90	0,994
78	Serbia	8,97	7,76	12,54	10,95	8,06	8,03	6,92	8,36	33003,27	0,995
79	Guatemala	9,39	7,19	9,90	8,68	9,84	4,74	4,50	8,29	33011,56	0,995
80	Mauritius	10,72	5,34	8,82	7,14	5,44	7,93	6,79	8,03	33019,59	0,995
81	Sw aziland	9,53	5,00	3,14	3,74	1,18	1,47	1,02	7,27	33026,86	0,995
82	Burundi	6,86	7,35	6,99	6,99	7,11	6,82	6,49	7,11	33033,96	0,996
83	Armenia	6,81	7,13	7,50	5,67	4,54	3,15	2,34	6,97	33040,93	0,996
84	Turkmenistan	6,93	6,73	5,83	7,73	4,16	2,70	4,23	6,83	33047,76	0,996
85	Nicaragua	5,96	7,53	5,41	11,87	3,56	5,40	5,70	6,74	33054,50	0,996
86	Equatorial Gu	6,22	6,36	5,67	5,39	5,12	4,95	4,95	6,29	33060,79	0,996
87	Brunei Darus	5,32	6,85	8,08	5,90	4,27	4,00	3,57	6,08	33066,88	0,997
88	Bolivia (Plurin	4,45	7,69	7,50	6,79	0,37	1,87	2,25	6,07	33072,94	0,997
89	Albania	5,36	6,50	6,49	6,59	5,67	1,64	2,58	5,93	33078,87	0,997
90	Ethiopia	0,00	11,00	11,28	10,80	5,46	4,25	4,69	5,50	33084,37	0,997
91	Liberia	4,98	5,52	5,41	4,82	4,51	3,74	3,13	5,25	33089,62	0,997
92	Georgia	4,57	5,86	4,31	2,66	1,38	1,20	1,68	5,21	33094,84	0,997
93	Zambia	0,66	9,23	9,23	8,80	4,99	4,40	3,03	4,95	33099,78	0,998
94	Bahamas	3,50	6,13	3,05	2,73	2,72	2,71	3,52	4,81	33104,60	0,998
95	Bosnia and H	5,77	3,48	3,35	4,06	5,13	3,37	2,11	4,63	33109,23	0,998
96	Maldives	5,06	4,03	3,67	3,69	3,19	3,32	2,45	4,55	33113,77	0,998
97	Myanmar	4,13	4,47	5,75	9,66	3,02	1,98	1,48	4,30	33118,07	0,998
98	South Sudan	4,13	4,13	0,00	4,64	2,31	3,24	3,36	4,13	33122,20	0,998
99	Rw anda	3,78	4,44	5,48	3,66	3,78	3,28	3,61	4,11	33126,31	0,998
100	Kyrgyzstan	4,39	3,72	2,96	2,91	3,99	2,40	1,58	4,05	33130,36	0,998
101	Barbados	5,07	2,32	2,65	2,66	2,30	1,23	1,06	3,69	33134,05	0,999
102	Haiti	3,85	3,41	4,24	5,15	1,95	2,65	3,25	3,63	33137,68	0,999
103	Lesotho	3,75	3,14	2,50	2,24	1,96	1,14	0,75	3,45	33141,13	0,999
104	Papua New G	3,17	3,29	1,69	3,06	3,02	2,87	2,32	3,23	33144,36	0,999
105	Guinea Bissa	2,75	2,86	2,86	2,70	2,31	2,81	2,48	2,81	33147,17	0,999
106	Belize	2,51	3,09	1,94	2,58	2,43	2,42	2,26	2,80	33149,97	0,999
107	Lao People's	2,15	2,46	2,66	2,75	1,60	2,00	2,00	2,31	33152,27	0,999
108	Sao Tome an	4,13	0,16	0,14	0,13	0,10	0,09	0,09	2,14	33154,42	0,999
109	Suriname	2,68	1,29	4,01	1,51	1,24	1,49	1,40	1,98	33156,40	0,999
110	Solomon Islar	1,60	2,26	2,04	1,62	0,17	0,26	0,18	1,93	33158,33	0,999
111	The Former Y	2,29	1,32	0,90	0,74	0,72	0,57	0,18	1,80	33160,13	0,999
112	Guyana	1,06	2,35	2,41	1,36	0,96	0,80	1,34	1,71	33161,84	0,999
113	United Repub	1,40	1,99	9,97	9,45	1,64	1,30	1,18	1,69	33163,53	0,999
114	Sierra Leone	1,54	1,80	1,87	2,59	0,84	1,47	0,99	1,67	33165,20	1,000
115	Gambia	1,49	1,54	0,98	1,91	0,86	0,77	0,75	1,51	33166,71	1,000
116	Seychelles	1,44	1,32	0,93	1,01	0,55	0,43	0,33	1,38	33168,09	1,000
117	Mongolia	1,15	1,46	1,16	2,87	0,94	0,38	0,64	1,30	33169,40	1,000
118	Nepal	1,10	1,10	1,10	0,74	0,66	0,83	0,55	1,10	33170,50	1,000
119	Saint Lucia	1,37	0,81	1,07	0,75	0,57	0,83	0,47	1,09	33171,59	1,000
120	Eritrea	1,05	1,12	0,96	1,01	1,02	1,00	0,97	1,08	33172,67	1,000
121	Cabo Verde	1,78	0,26	0,28	0,23	0,17	0,17	0,14	1,02	33173,69	1,000
122	Republic of M	1,16	0,71	1,31	1,88	0,99	0,76	0,82	0,94	33174,62	1,000
123	Grenada	0,83	0,83	0,18	0,26	0,33	0,36	0,22	0,83	33175,45	1,000
124	Montenegro	0,94	0,58	0,72	0,94	0,75	0,72	0,67	0,76	33176,22	1,000

GROUP 4 (CONTINUED)											
125	Djibouti	0,63	0,66	0,66	0,64	0,62	0,57	0,56	0,65	33176,86	1,000
126	Timor-Leste	0,51	0,49	0,15	0,21	0,29	0,31	0,41	0,50	33177,36	1,000
127	Saint Kitts an	0,42	0,56	0,49	0,38	0,32	0,47	0,36	0,49	33177,85	1,000
128	Dominica	0,41	0,39	0,16	0,01	0,09	0,17	0,13	0,40	33178,25	1,000
129	Bhutan	0,31	0,31	0,28	0,31	0,28	0,25	0,20	0,31	33178,56	1,000
130	Antigua and B	0,52	0,08	0,38	0,11	0,22	0,04	0,06	0,30	33178,86	1,000
131	Vanuatu	0,10	0,46	0,08	0,06	0,06	0,04	0,02	0,28	33179,14	1,000
132	Saint Vincent	0,41	0,15	0,30	0,28	0,18	0,09	0,03	0,28	33179,43	1,000
133	Samoa	0,19	0,31	0,29	0,13	0,11	0,08	0,07	0,25	33179,68	1,000
134	Marshall Islan	0,19	0,25	0,24	0,21	0,12	0,08	0,08	0,22	33179,90	1,000
135	Palau	0,14	0,19	0,17	0,17	0,12	0,12	0,11	0,16	33180,06	1,000
136	Uganda	0,01	0,29	0,12	0,05	0,00	0,00	0,00	0,15	33180,21	1,000
137	Tonga	0,13	0,15	0,07	0,05	0,04	0,02	0,02	0,14	33180,35	1,000
138	Micronesia (F	0,09	0,18	0,06	0,06	0,03	0,09	0,00	0,14	33180,49	1,000
139	Comoros	0,14	0,14	0,12	0,11	0,12	0,14	0,10	0,14	33180,62	1,000
140	Tuvalu	0,09	0,09	0,01	0,02	0,00	0,00	0,02	0,09	33180,71	1,000
141	Kiribati	0,04	0,07	0,01	0,03	0,03	0,00	0,03	0,05	33180,77	1,000
142	Cook Islands	0,03	0,07	0,06	0,04	0,02	0,00	0,00	0,05	33180,82	1,000
143	Nauru	0,01	0,01	0,01	0,01	0,00	0,00	0,02	0,01	33180,83	1,000
144	Niue	0,00	0,02	0,00	0,00	0,00	0,00	0,00	0,01	33180,83	1,000
		457,74	465,86	474,91	477,51	360,31	332,23	310,09	461,80		
Value compared to baseline for group 4				**1,03**	**1,03**	**0,78**	**0,72**	**0,67**			

Table A1-7 Total HCFC consumption levels 2009-2015 in ODP tonnes for all Article 5 parties, the baseline for the various parties in ODP tonnes, the contribution of each baseline quantity of parties to the total and the share of the baseline (ODP tonnes) per party in the total. Article 5 parties are split in 4 groups, Group 1 China, Group 2-3 remaining non LVC countries, Group 4 LVC countries

HCFCs Calculated Consumption in ODP Tonnes and Shares of Various Countries for Baseline and Year 2015

Nr	CntryName	2009 MT	2010 MT	2015 MT	Base	Share	Total cons.	Accumul. Share	2015	Share	Total cons.	Accumul. Share
GROUP 1												
1	China	18602,65	19935,34	13485,21	19269,00	0,581	19269,00	0,581	13485,21	0,588	13485,21	0,588
GROUP 2												
2	India	1598,73	1617,61	992,54	1608,17	0,048	20877,17	0,629	992,54	0,030	14477,75	0,631
3	Saudi Arabia	1362,01	1575,38	1305,45	1468,70	0,044	22345,86	0,673	1305,45	0,039	15783,20	0,688
4	Brazil	1415,47	1238,98	1025,81	1327,22	0,040	23673,09	0,713	1025,81	0,031	16809,00	0,733
5	Mexico	1125,92	1171,75	652,58	1148,84	0,035	24821,92	0,748	652,58	0,020	17461,59	0,761
6	Thailand	826,58	1028,45	773,50	927,52	0,028	25749,44	0,776	773,50	0,023	18235,09	0,795
7	Turkey	609,94	493,03	17,95	551,48	0,017	26300,92	0,793	17,95	0,001	18253,05	0,795
8	Malaysia	494,04	537,47	418,50	515,75	0,016	26816,68	0,808	418,50	0,013	18671,55	0,814
9	Kuwait	398,11	439,09	338,98	418,60	0,013	27235,27	0,821	338,98	0,010	19010,53	0,828
10	Indonesia	374,85	433,00	152,67	403,92	0,012	27639,20	0,833	152,67	0,005	19163,19	0,835
11	Argentina	326,15	475,19	295,42	400,67	0,012	28039,87	0,845	295,42	0,009	19458,61	0,848
12	Egypt	396,60	375,94	343,12	386,27	0,012	28426,13	0,857	343,12	0,010	19801,73	0,863
13	Iran (Islamic Re	362,10	398,77	309,28	380,43	0,011	28806,57	0,868	309,28	0,009	20111,01	0,876
14	South Africa	339,18	400,13	208,28	369,65	0,011	29176,22	0,879	208,28	0,006	20319,29	0,885
15	Nigeria	321,39	368,37	177,92	344,88	0,010	29521,10	0,890	177,92	0,005	20497,20	0,893
16	Pakistan	239,80	254,98	203,13	247,39	0,007	29768,49	0,897	203,13	0,006	20700,33	0,902
17	Colombia	209,67	241,47	164,60	225,57	0,007	29994,06	0,904	164,60	0,005	20864,94	0,909
18	Viet Nam	207,48	234,93	192,70	221,21	0,007	30215,26	0,911	192,70	0,006	21057,63	0,918
19	Philippines	194,71	221,97	123,26	208,34	0,006	30423,60	0,917	123,26	0,004	21180,90	0,923
20	Venezuela (Bo	216,23	197,65	45,72	206,94	0,006	30630,54	0,923	45,72	0,001	21226,62	0,925
21	Yemen	157,79	158,59	0,00	158,19	0,005	30788,73	0,928	0,00	0,000	21226,62	0,925
22	Syrian Arab Re	147,22	122,82	46,74	135,02	0,004	30923,76	0,932	46,74	0,001	21273,36	0,927
23	Libya	97,47	139,26	119,81	118,37	0,004	31042,12	0,936	119,81	0,004	21393,16	0,932
24	Iraq	110,96	105,83	93,39	108,39	0,003	31150,52	0,939	93,39	0,003	21486,55	0,936
25	Cameroon	104,23	73,39	67,24	88,81	0,003	31239,33	0,941	67,24	0,002	21553,79	0,939
26	Chile	75,21	99,80	67,63	87,50	0,003	31326,83	0,944	67,63	0,002	21621,42	0,942
27	Qatar	79,75	94,11	65,89	86,93	0,003	31413,76	0,947	65,89	0,002	21687,32	0,945
28	Jordan	70,90	95,05	73,99	82,97	0,003	31496,73	0,949	73,99	0,002	21761,30	0,948
29	Lebanon	58,41	88,64	65,86	73,52	0,002	31570,25	0,951	65,86	0,002	21827,17	0,951
30	Bangladesh	67,75	77,54	64,18	72,64	0,002	31642,89	0,954	64,18	0,002	21891,35	0,954
31	Korea, DPR	53,35	79,79	61,67	66,57	0,002	31709,46	0,956	61,67	0,002	21953,02	0,957
32	Congo, DR	55,82	76,60	15,40	66,21	0,002	31775,68	0,958	15,40	0,000	21968,42	0,957
33	Côte d'Ivoire	61,67	65,91	51,33	63,79	0,002	31839,46	0,960	51,33	0,002	22019,75	0,960
34	Algeria	60,35	63,88	53,43	62,12	0,002	31901,58	0,961	53,43	0,002	22073,18	0,962
35	Morocco	67,97	51,38	28,36	59,68	0,002	31961,26	0,963	28,36	0,001	22101,55	0,963
	SUM	12287,77	13096,75	8616,34	12692,26	0,383			8616,34	0,383		
GROUP 3												
36	Ghana	77,33	37,17	20,41	57,25	0,002	32018,50	0,965	20,41	0,001	22163,22	0,966
37	Sudan	50,60	54,73	46,79	52,66	0,002	32071,17	0,967	46,79	0,001	22210,01	0,968
38	Kenya	54,73	49,57	20,60	52,15	0,002	32123,32	0,968	20,60	0,001	22230,61	0,969
39	Bahrain	45,08	58,73	45,98	51,90	0,002	32175,22	0,970	45,98	0,001	22276,59	0,971
40	Dominican Rep	48,48	55,11	43,39	51,80	0,002	32227,02	0,971	43,39	0,001	22319,99	0,973
41	Trinidad and To	38,01	53,94	12,64	45,97	0,001	32272,99	0,973	12,64	0,000	22332,63	0,973
42	Somalia	44,88	45,27	15,92	45,08	0,001	32318,06	0,974	15,92	0,000	22348,55	0,974
43	Tunisia	44,28	37,03	35,57	40,66	0,001	32358,72	0,975	35,57	0,001	22384,12	0,975
44	Senegal	34,76	37,54	20,63	36,15	0,001	32394,87	0,976	20,63	0,001	22404,74	0,976
45	Oman	30,73	32,20	22,30	31,47	0,001	32426,33	0,977	22,30	0,001	22427,04	0,977
46	Gabon	29,75	30,64	19,25	30,19	0,001	32456,53	0,978	19,25	0,001	22446,29	0,978
47	Burkina Faso	26,73	31,03	11,99	28,88	0,001	32485,41	0,979	11,99	0,000	22458,28	0,979
48	Peru	27,26	26,45	22,82	26,86	0,001	32512,26	0,980	22,82	0,001	22481,10	0,980
49	Madagascar	32,99	16,83	14,03	24,91	0,001	32537,17	0,981	14,03	0,000	22495,13	0,980
50	Panama	24,95	24,58	17,53	24,77	0,001	32561,94	0,981	17,53	0,001	22512,66	0,981
51	Benin	23,62	23,96	19,28	23,79	0,001	32585,72	0,982	19,28	0,001	22531,94	0,982
52	Afghanistan	22,19	24,86	20,24	23,53	0,001	32609,25	0,983	20,24	0,001	22552,18	0,983
53	Ecuador	25,74	21,24	20,10	23,49	0,001	32632,74	0,983	20,10	0,001	22572,28	0,984
54	Uruguay	21,96	24,71	15,78	23,34	0,001	32656,08	0,984	15,78	0,000	22588,06	0,984
55	Guinea	21,77	23,45	5,65	22,61	0,001	32678,69	0,985	5,65	0,000	22593,70	0,985
56	Mauritania	20,35	20,46	20,08	20,41	0,001	32699,09	0,985	20,08	0,001	22613,78	0,985
57	Togo	19,25	20,63	16,61	19,94	0,001	32719,03	0,986	16,61	0,001	22630,39	0,986
	SUM	765,44	750,11	487,58	757,78	0,023			487,58	0,015		

GROUP 4													
58	Honduras	17,81	21,99	10,85	19,90	0,001	32738,94	0,987	10,85	0,000	22647,92	0,987
59	Paraguay	15,09	20,91	15,99	18,00	0,001	32756,93	0,987	15,99	0,000	22663,91	0,988
60	Zimbabw e	17,08	18,50	14,16	17,79	0,001	32774,73	0,988	14,16	0,000	22678,07	0,988
61	Cuba	11,70	22,07	13,41	16,88	0,001	32791,61	0,988	13,41	0,000	22691,49	0,989
62	Jamaica	18,24	14,40	2,92	16,32	0,000	32807,93	0,989	2,92	0,000	22694,41	0,989
63	Chad	26,02	6,18	14,20	16,10	0,000	32824,02	0,989	14,20	0,000	22708,61	0,990
64	Niger	15,95	15,99	13,02	15,97	0,000	32839,99	0,990	13,02	0,000	22721,64	0,990
65	Angola	19,25	12,65	13,78	15,95	0,000	32855,94	0,990	13,78	0,000	22735,42	0,991
66	Mali	14,43	15,52	10,12	14,97	0,000	32870,92	0,991	10,12	0,000	22745,54	0,991
67	Cambodia	17,11	12,83	11,69	14,97	0,000	32885,89	0,991	11,69	0,000	22757,23	0,992
68	Costa Rica	14,20	13,97	10,96	14,08	0,000	32899,97	0,992	10,96	0,000	22768,18	0,992
69	Sri Lanka	13,42	14,30	10,31	13,86	0,000	32913,83	0,992	10,31	0,000	22778,49	0,993
70	Central African	11,88	12,09	10,45	11,99	0,000	32925,82	0,992	10,45	0,000	22788,94	0,993
71	El Salvador	11,87	11,49	5,82	11,68	0,000	32937,50	0,993	5,82	0,000	22794,76	0,993
72	Botsw ana	11,01	11,01	9,75	11,01	0,000	32948,51	0,993	9,75	0,000	22804,51	0,994
73	Malaw i	8,56	13,04	8,91	10,80	0,000	32959,31	0,993	8,91	0,000	22813,42	0,994
74	Congo	9,68	10,60	8,15	10,14	0,000	32969,45	0,994	8,15	0,000	22821,57	0,995
75	Mozambique	8,68	8,68	7,15	8,68	0,000	32978,12	0,994	7,15	0,000	22828,72	0,995
76	Fiji	7,63	9,19	3,87	8,41	0,000	32986,53	0,994	3,87	0,000	22832,59	0,995
77	Namibia	6,03	10,71	5,36	8,37	0,000	32994,90	0,994	5,36	0,000	22837,96	0,995
78	Serbia	8,97	7,76	6,92	8,36	0,000	33003,27	0,995	6,92	0,000	22844,88	0,996
79	Guatemala	9,39	7,19	4,50	8,29	0,000	33011,56	0,995	4,50	0,000	22849,37	0,996
80	Mauritius	10,72	5,34	6,79	8,03	0,000	33019,59	0,995	6,79	0,000	22856,16	0,996
81	Sw aziland	9,53	5,00	1,02	7,27	0,000	33026,86	0,995	1,02	0,000	22857,18	0,996
82	Burundi	6,86	7,35	6,49	7,11	0,000	33033,96	0,996	6,49	0,000	22863,67	0,996
83	Armenia	6,81	7,13	2,34	6,97	0,000	33040,93	0,996	2,34	0,000	22866,01	0,996
84	Turkmenistan	6,93	6,73	4,23	6,83	0,000	33047,76	0,996	4,23	0,000	22870,24	0,997
85	Nicaragua	5,96	7,53	5,70	6,74	0,000	33054,50	0,996	5,70	0,000	22875,94	0,997
86	Equatorial Guin	6,22	6,36	4,95	6,29	0,000	33060,79	0,996	4,95	0,000	22880,89	0,997
87	Brunei Darussa	5,32	6,85	3,57	6,08	0,000	33066,88	0,997	3,57	0,000	22884,46	0,997
88	Bolivia (Plurinat	4,45	7,69	2,25	6,07	0,000	33072,94	0,997	2,25	0,000	22886,71	0,997
89	Albania	5,36	6,50	2,58	5,93	0,000	33078,87	0,997	2,58	0,000	22889,29	0,997
90	Ethiopia	0,00	11,00	4,69	5,50	0,000	33084,37	0,997	4,69	0,000	22893,98	0,998
91	Liberia	4,98	5,52	3,13	5,25	0,000	33089,62	0,997	3,13	0,000	22897,11	0,998
92	Georgia	4,57	5,86	1,68	5,21	0,000	33094,84	0,997	1,68	0,000	22898,79	0,998
93	Zambia	0,66	9,23	3,03	4,95	0,000	33099,78	0,998	3,03	0,000	22901,81	0,998
94	Bahamas	3,50	6,13	3,52	4,81	0,000	33104,60	0,998	3,52	0,000	22905,33	0,998
95	Bosnia and Her	5,77	3,48	2,11	4,63	0,000	33109,23	0,998	2,11	0,000	22907,44	0,998
96	Maldives	5,06	4,03	2,45	4,55	0,000	33113,77	0,998	2,45	0,000	22909,89	0,998
97	Myanmar	4,13	4,47	1,48	4,30	0,000	33118,07	0,998	1,48	0,000	22911,37	0,998
98	South Sudan	4,13	4,13	3,36	4,13	0,000	33122,20	0,998	3,36	0,000	22914,72	0,999
99	Rw anda	3,78	4,44	3,61	4,11	0,000	33126,31	0,998	3,61	0,000	22918,34	0,999
100	Kyrgyzstan	4,39	3,72	1,58	4,05	0,000	33130,36	0,998	1,58	0,000	22919,92	0,999
101	Barbados	5,07	2,32	1,06	3,69	0,000	33134,05	0,999	1,06	0,000	22920,98	0,999
102	Haiti	3,85	3,41	3,25	3,63	0,000	33137,68	0,999	3,25	0,000	22924,23	0,999
103	Lesotho	3,75	3,14	0,75	3,45	0,000	33141,13	0,999	0,75	0,000	22924,99	0,999
104	Papua New Gu	3,17	3,29	2,32	3,23	0,000	33144,36	0,999	2,32	0,000	22927,31	0,999
105	Guinea Bissau	2,75	2,86	2,48	2,81	0,000	33147,17	0,999	2,48	0,000	22929,78	0,999
106	Belize	2,51	3,09	2,26	2,80	0,000	33149,97	0,999	2,26	0,000	22932,04	0,999
107	Lao People's D	2,15	2,46	2,00	2,31	0,000	33152,27	0,999	2,00	0,000	22934,04	0,999
108	Sao Tome and	4,13	0,16	0,09	2,14	0,000	33154,42	0,999	0,09	0,000	22934,13	0,999
109	Suriname	2,68	1,29	1,40	1,98	0,000	33156,40	0,999	1,40	0,000	22935,53	0,999
110	Solomon Island	1,60	2,26	0,18	1,93	0,000	33158,33	0,999	0,18	0,000	22935,71	1,000
111	The Former Yu	2,29	1,32	0,18	1,80	0,000	33160,13	0,999	0,18	0,000	22935,89	1,000
112	Guyana	1,06	2,35	1,34	1,71	0,000	33161,84	0,999	1,34	0,000	22937,23	1,000
113	United Republic	1,40	1,99	1,18	1,69	0,000	33163,53	0,999	1,18	0,000	22938,41	1,000
114	Sierra Leone	1,54	1,80	0,99	1,67	0,000	33165,20	1,000	0,99	0,000	22939,40	1,000
115	Gambia	1,49	1,54	0,75	1,51	0,000	33166,71	1,000	0,75	0,000	22940,15	1,000
116	Seychelles	1,44	1,32	0,33	1,38	0,000	33168,09	1,000	0,33	0,000	22940,48	1,000
117	Mongolia	1,15	1,46	0,64	1,30	0,000	33169,40	1,000	0,64	0,000	22941,12	1,000
118	Nepal	1,10	1,10	0,55	1,10	0,000	33170,50	1,000	0,55	0,000	22941,67	1,000
119	Saint Lucia	1,37	0,81	0,47	1,09	0,000	33171,59	1,000	0,47	0,000	22942,14	1,000
120	Eritrea	1,05	1,12	0,97	1,08	0,000	33172,67	1,000	0,97	0,000	22943,10	1,000
121	Cabo Verde	1,78	0,26	0,14	1,02	0,000	33173,69	1,000	0,14	0,000	22943,24	1,000
122	Republic of Mo	1,16	0,71	0,82	0,94	0,000	33174,62	1,000	0,82	0,000	22944,06	1,000
123	Grenada	0,83	0,83	0,22	0,83	0,000	33175,45	1,000	0,22	0,000	22944,28	1,000
124	Montenegro	0,94	0,58	0,67	0,76	0,000	33176,22	1,000	0,67	0,000	22944,95	1,000

GROUP 4 (CONTINUED)												
125	Djibouti	0,63	0,66	0,56	0,65	0,000	33176,86	1,000	0,56	0,000	22945,50	1,000
126	Timor-Leste	0,51	0,49	0,41	0,50	0,000	33177,36	1,000	0,41	0,000	22945,91	1,000
127	Saint Kitts and	0,42	0,56	0,36	0,49	0,000	33177,85	1,000	0,36	0,000	22946,28	1,000
128	Dominica	0,41	0,39	0,13	0,40	0,000	33178,25	1,000	0,13	0,000	22946,41	1,000
129	Bhutan	0,31	0,31	0,20	0,31	0,000	33178,56	1,000	0,20	0,000	22946,61	1,000
130	Antigua and Ba	0,52	0,08	0,06	0,30	0,000	33178,86	1,000	0,06	0,000	22946,67	1,000
131	Vanuatu	0,10	0,46	0,02	0,28	0,000	33179,14	1,000	0,02	0,000	22946,69	1,000
132	Saint Vincent a	0,41	0,15	0,03	0,28	0,000	33179,43	1,000	0,03	0,000	22946,71	1,000
133	Samoa	0,19	0,31	0,07	0,25	0,000	33179,68	1,000	0,07	0,000	22946,78	1,000
134	Marshall Islands	0,19	0,25	0,08	0,22	0,000	33179,90	1,000	0,08	0,000	22946,87	1,000
135	Palau	0,14	0,19	0,11	0,16	0,000	33180,06	1,000	0,11	0,000	22946,98	1,000
136	Uganda	0,01	0,29	0,00	0,15	0,000	33180,21	1,000	0,00	0,000	22946,98	1,000
137	Tonga	0,13	0,15	0,02	0,14	0,000	33180,35	1,000	0,02	0,000	22947,00	1,000
138	Micronesia (Fe	0,09	0,18	0,00	0,14	0,000	33180,49	1,000	0,00	0,000	22947,00	1,000
139	Comoros	0,14	0,14	0,10	0,14	0,000	33180,62	1,000	0,10	0,000	22947,10	1,000
140	Tuvalu	0,09	0,09	0,02	0,09	0,000	33180,71	1,000	0,02	0,000	22947,12	1,000
141	Kiribati	0,04	0,07	0,03	0,05	0,000	33180,77	1,000	0,03	0,000	22947,15	1,000
142	Cook Islands	0,03	0,07	0,00	0,05	0,000	33180,82	1,000	0,00	0,000	22947,15	1,000
143	Nauru	0,01	0,01	0,02	0,01	0,000	33180,83	1,000	0,02	0,000	22947,16	1,000
144	Niue	0,00	0,02	0,00	0,01	0,000	33180,83	1,000	0,00	0,000	22947,16	1,000
		457,74	465,86	310,09	461,80	0,014			310,09	0,014		

Table A1-8 Total HCFC consumption levels for 2009-2010 (baseline) and for 2015 in ODP tonnes for all Article 5 parties, the contribution of each quantity per party to the total (baseline and 2015 consumption) and the share of the baseline and the 2015 total HCFC consumption per party in the total. Article 5 parties are split in 4 groups, Group 1 China, Group 2-3 remaining non LVC countries, Group 4 LVC countries

HCFCs Baseline Cons in ODP tonnes, Shares of Various Countries, Funding 2009-2016 Approved and ODP Tonnes Approved

Nr	CntryName	2009 MT	2010 MT	Base	Percent of total	Accumul. Share	Funding approved	Percent of total	ODP-t approved	Percent of total
GROUP 1										
1	China	18602,65	19935,34	19269,00	58,073	0,581	893950357	64,66	12161,47	62,17
GROUP 2										
2	India	1598,73	1617,61	1608,17	4,847	0,629	71284604	5,16	1111,26	5,68
3	Saudi Arabia	1362,01	1575,38	1468,70	4,426	0,673	14421066	1,04	703,29	3,60
4	Brazil	1415,47	1238,98	1327,22	4,000	0,713	59842927	4,33	684,36	3,50
5	Mexico	1125,92	1171,75	1148,84	3,462	0,748	31448465	2,27	961,47	4,92
6	Thailand	826,58	1028,45	927,52	2,795	0,776	24275977	1,76	234,73	1,20
7	Turkey	609,94	493,03	551,48	1,662	0,793	15263964	1,10	507,87	2,60
8	Malaysia	494,04	537,47	515,75	1,554	0,808	16874258	1,22	259,22	1,33
9	Kuwait	398,11	439,09	418,60	1,262	0,821	10667412	0,77	239,15	1,22
10	Indonesia	374,85	433,00	403,92	1,217	0,833	22601210	1,63	219,33	1,12
11	Argentina	326,15	475,19	400,67	1,208	0,845	11597593	0,84	83,53	0,43
12	Egypt	396,60	375,94	386,27	1,164	0,857	9164414	0,66	174,00	0,89
13	Iran (Islamic Republic o	362,10	398,77	380,43	1,147	0,868	23148862	1,67	326,77	1,67
14	South Africa	339,18	400,13	369,65	1,114	0,879	6990905	0,51	176,72	0,90
15	Nigeria	321,39	368,37	344,88	1,039	0,890	5309242	0,38	79,50	0,41
16	Pakistan	239,80	254,98	247,39	0,746	0,897	11561189	0,84	152,08	0,78
17	Colombia	209,67	241,47	225,57	0,680	0,904	12967798	0,94	201,21	1,03
18	Viet Nam	207,48	234,93	221,21	0,667	0,911	25493389	1,84	273,77	1,40
19	Philippines	194,71	221,97	208,34	0,628	0,917	2521955	0,18	45,00	0,23
20	Venezuela (Bolivarian	216,23	197,65	206,94	0,624	0,923	5567434	0,40	87,57	0,45
21	Yemen	157,79	158,59	158,19	0,477	0,928	868100	0,06	63,28	0,32
22	Syrian Arab Republic	147,22	122,82	135,02	0,407	0,932	0	0,00	12,90	0,07
23	Libya	97,47	139,26	118,37	0,357	0,936	2042462	0,15	26,51	0,14
24	Iraq	110,96	105,83	108,39	0,327	0,939	1301600	0,09	14,98	0,08
25	Cameroon	104,23	73,39	88,81	0,268	0,941	1271429	0,09	9,70	0,05
26	Chile	75,21	99,80	87,50	0,264	0,944	5581000	0,40	71,52	0,37
27	Qatar	79,75	94,11	86,93	0,262	0,947	2206395	0,16	57,86	0,30
28	Jordan	70,90	95,05	82,97	0,250	0,949	7005871	0,51	70,30	0,36
29	Lebanon	58,41	88,64	73,52	0,222	0,951	7180335	0,52	61,16	0,31
30	Bangladesh	67,75	77,54	72,64	0,219	0,954	1692305	0,12	24,53	0,13
31	Korea, DPR	53,35	79,79	66,57	0,201	0,956	908567	0,07	20,03	0,10
32	Congo, DR	55,82	76,60	66,21	0,200	0,958	527150	0,04	5,80	0,03
33	Côte d'Ivoire	61,67	65,91	63,79	0,192	0,960	2002071	0,14	22,33	0,11
34	Algeria	60,35	63,88	62,12	0,187	0,961	2146062	0,16	14,48	0,07
35	Morocco	67,97	51,38	59,68	0,180	0,963	1383246	0,10	14,20	0,07
	SUM	12287,77	13096,75	12692,26	38,252		417119257		7010,41	
GROUP 3										
36	Ghana	77,33	37,17	57,25	0,173	0,965	1475909	0,11	20,05	0,10
37	Sudan	50,60	54,73	52,66	0,159	0,967	4508097	0,33	47,49	0,24
38	Kenya	54,73	49,57	52,15	0,157	0,968	1009000	0,07	11,00	0,06
39	Bahrain	45,08	58,73	51,90	0,156	0,970	3033814	0,22	23,21	0,12
40	Dominican Republic	48,48	55,11	51,80	0,156	0,971	3415669	0,25	42,50	0,22
41	Trinidad and Tobago	38,01	53,94	45,97	0,139	0,973	1572438	0,11	17,66	0,09
42	Somalia	44,88	45,27	45,08	0,136	0,974	428400	0,03	5,75	0,03
43	Tunisia	44,28	37,03	40,66	0,123	0,975	1966209	0,14	10,60	0,05
44	Senegal	34,76	37,54	36,15	0,109	0,976	693637	0,05	7,34	0,04
45	Oman	30,73	32,20	31,47	0,095	0,977	1002304	0,07	12,11	0,06
46	Gabon	29,75	30,64	30,19	0,091	0,978	600204	0,04	10,57	0,05
47	Burkina Faso	26,73	31,03	28,88	0,087	0,979	889561	0,06	10,11	0,05
48	Peru	27,26	26,45	26,86	0,081	0,980	310111	0,02	3,74	0,02
49	Madagascar	32,99	16,83	24,91	0,075	0,981	618500	0,04	6,00	0,03
50	Panama	24,95	24,58	24,77	0,075	0,981	1138871	0,08	13,89	0,07
51	Benin	23,62	23,96	23,79	0,072	0,982	697600	0,05	8,33	0,04
52	Afghanistan	22,19	24,86	23,53	0,071	0,983	767384	0,06	8,33	0,04
53	Ecuador	25,74	21,24	23,49	0,071	0,983	2114873	0,15	4,68	0,02
54	Uruguay	21,96	24,71	23,34	0,070	0,984	1591022	0,12	15,23	0,08
55	Guinea	21,77	23,45	22,61	0,068	0,985	713510	0,05	7,91	0,04
56	Mauritania	20,35	20,46	20,41	0,061	0,985	0	0,00	0,00	0,00
57	Togo	19,25	20,63	19,94	0,060	0,986	692650	0,05	7,00	0,04
	SUM	765,44	750,11	757,78	2,284		29239763		293,50	

GROUP 4										
58	Honduras	17,81	21,99	19,90	**0,060**	0,987	691.000	**0,05**	1,58	**0,01**
59	Paraguay	15,09	20,91	18,00	**0,054**	0,987	695.400	**0,05**	1,59	**0,01**
60	Zimbabwe	17,08	18,50	17,79	**0,054**	0,988	1.163.088	**0,08**	2,66	**0,01**
61	Cuba	11,70	22,07	16,88	**0,051**	0,988	1.878.592	**0,14**	4,30	**0,02**
62	Jamaica	18,24	14,40	16,32	**0,049**	0,989	708.844	**0,05**	1,62	**0,01**
63	Chad	26,02	6,18	16,10	**0,049**	0,989	619.875	**0,04**	1,42	**0,01**
64	Niger	15,95	15,99	15,97	**0,048**	0,990	617.125	**0,04**	0,05	**0,00**
65	Angola	19,25	12,65	15,95	**0,048**	0,990	191.840	**0,01**	0,44	**0,00**
66	Mali	14,43	15,52	14,97	**0,045**	0,991	617.400	**0,04**	1,41	**0,01**
67	Cambodia	17,11	12,83	14,97	**0,045**	0,991	1.772.250	**0,13**	4,05	**0,02**
68	Costa Rica	14,20	13,97	14,08	**0,042**	0,992	1.240.037	**0,09**	2,84	**0,01**
69	Sri Lanka	13,42	14,30	13,86	**0,042**	0,992	710.151	**0,05**	1,62	**0,01**
70	Central African Republ	11,88	12,09	11,99	**0,036**	0,992	619.050	**0,04**	1,42	**0,01**
71	El Salvador	11,87	11,49	11,68	**0,035**	0,993	1.138.423	**0,08**	2,60	**0,01**
72	Botswana	11,01	11,01	11,01	**0,033**	0,993	616.000	**0,04**	1,41	**0,01**
73	Malawi	8,56	13,04	10,80	**0,033**	0,993	390.700	**0,03**	0,89	**0,00**
74	Congo	9,68	10,60	10,14	**0,031**	0,994	388.500	**0,03**	0,89	**0,00**
75	Mozambique	8,68	8,68	8,68	**0,026**	0,994	349.950	**0,03**	0,80	**0,00**
76	Fiji	7,63	9,19	8,41	**0,025**	0,994	348.371	**0,03**	0,80	**0,00**
77	Namibia	6,03	10,71	8,37	**0,025**	0,994	1.009.000	**0,07**	2,31	**0,01**
78	Serbia	8,97	7,76	8,36	**0,025**	0,995	1.050.408	**0,08**	2,40	**0,01**
79	Guatemala	9,39	7,19	8,29	**0,025**	0,995	464.307	**0,03**	1,06	**0,01**
80	Mauritius	10,72	5,34	8,03	**0,024**	0,995	1.064.500	**0,08**	2,43	**0,01**
81	Swaziland	9,53	5,00	7,27	**0,022**	0,995	955.344	**0,07**	2,18	**0,01**
82	Burundi	6,86	7,35	7,11	**0,021**	0,996	368.760	**0,03**	0,84	**0,00**
83	Armenia	6,81	7,13	6,97	**0,021**	0,996	888.017	**0,06**	2,03	**0,01**
84	Turkmenistan	6,93	6,73	6,83	**0,021**	0,996	700.954	**0,05**	1,60	**0,01**
85	Nicaragua	5,96	7,53	6,74	**0,020**	0,996	364.020	**0,03**	0,83	**0,00**
86	Equatorial Guinea	6,22	6,36	6,29	**0,019**	0,996	349.950	**0,03**	0,80	**0,00**
87	Brunei Darussalam	5,32	6,85	6,08	**0,018**	0,997	350.670	**0,03**	0,80	**0,00**
88	Bolivia (Plurinational St	4,45	7,69	6,07	**0,018**	0,997	347.130	**0,03**	0,79	**0,00**
89	Albania	5,36	6,50	5,93	**0,018**	0,997	346.750	**0,03**	0,79	**0,00**
90	Ethiopia	0,00	11,00	5,50	**0,017**	0,997	350.350	**0,03**	0,80	**0,00**
91	Liberia	4,98	5,52	5,25	**0,016**	0,997	355.950	**0,03**	0,81	**0,00**
92	Georgia	4,57	5,86	5,21	**0,016**	0,997	538.468	**0,04**	1,23	**0,01**
93	Zambia	0,66	9,23	4,95	**0,015**	0,998	350.350	**0,03**	0,80	**0,00**
94	Bahamas	3,50	6,13	4,81	**0,015**	0,998	342.345	**0,02**	0,78	**0,00**
95	Bosnia and Herzegovir	5,77	3,48	4,63	**0,014**	0,998	1.007.836	**0,07**	2,30	**0,01**
96	Maldives	5,06	4,03	4,55	**0,014**	0,998	1.219.900	**0,09**	2,79	**0,01**
97	Myanmar	4,13	4,47	4,30	**0,013**	0,998	314.000	**0,02**	0,72	**0,00**
98	South Sudan	4,13	4,13	4,13	**0,012**	0,998	233.700	**0,02**	0,53	**0,00**
99	Rwanda	3,78	4,44	4,11	**0,012**	0,998	312.000	**0,02**	0,71	**0,00**
100	Kyrgyzstan	4,39	3,72	4,05	**0,012**	0,998	877.888	**0,06**	2,01	**0,01**
101	Barbados	5,07	2,32	3,69	**0,011**	0,999	312.880	**0,02**	0,72	**0,00**
102	Haiti	3,85	3,41	3,63	**0,011**	0,999	312.516	**0,02**	0,71	**0,00**
103	Lesotho	3,75	3,14	3,45	**0,010**	0,999	316.400	**0,02**	0,72	**0,00**
104	Papua New Guinea	3,17	3,29	3,23	**0,010**	0,999	1.397.500	**0,10**	3,20	**0,02**
105	Guinea Bissau	2,75	2,86	2,81	**0,008**	0,999	311.800	**0,02**	0,71	**0,00**
106	Belize	2,51	3,09	2,80	**0,008**	0,999	313.740	**0,02**	0,72	**0,00**
107	Lao People's Democrat	2,15	2,46	2,31	**0,007**	0,999	316.400	**0,02**	0,72	**0,00**
108	Sao Tome and Principe	4,13	0,16	2,14	**0,006**	0,999	180.800	**0,01**	0,41	**0,00**
109	Suriname	2,68	1,29	1,98	**0,006**	0,999	233.060	**0,02**	0,53	**0,00**
110	Solomon Islands	1,60	2,26	1,93	**0,006**	0,999	220.351	**0,02**	0,50	**0,00**
111	The Former Yugoslav I	2,29	1,32	1,80	**0,005**	0,999	1.254.477	**0,09**	2,87	**0,01**
112	Guyana	1,06	2,35	1,71	**0,005**	0,999	819.091	**0,06**	1,87	**0,01**
113	United Republic of Tan	1,40	1,99	1,69	**0,005**	0,999	233.300	**0,02**	0,53	**0,00**
114	Sierra Leone	1,54	1,80	1,67	**0,005**	1,000	233.300	**0,02**	0,53	**0,00**
115	Gambia	1,49	1,54	1,51	**0,005**	1,000	233.300	**0,02**	0,53	**0,00**
116	Seychelles	1,44	1,32	1,38	**0,004**	1,000	676.000	**0,05**	1,55	**0,01**
117	Mongolia	1,15	1,46	1,30	**0,004**	1,000	413.580	**0,03**	0,95	**0,00**
118	Nepal	1,10	1,10	1,10	**0,003**	1,000	233.940	**0,02**	0,53	**0,00**
119	Saint Lucia	1,37	0,81	1,09	**0,003**	1,000	232.207	**0,02**	0,53	**0,00**
120	Eritrea	1,05	1,12	1,08	**0,003**	1,000	232.500	**0,02**	0,53	**0,00**
121	Cabo Verde	1,78	0,26	1,02	**0,003**	1,000	180.800	**0,01**	0,41	**0,00**
122	Republic of Moldova	1,16	0,71	0,94	**0,003**	1,000	288.213	**0,02**	0,66	**0,00**
123	Grenada	0,83	0,83	0,83	**0,003**	1,000	234.300	**0,02**	0,54	**0,00**
124	Montenegro	0,94	0,58	0,76	**0,002**	1,000	434.838	**0,03**	0,99	**0,01**

GROUP 4 (CONTINUED)										
125	Djibouti	0,63	0,66	0,65	**0,002**	1,000	185.885	**0,01**	0,43	**0,00**
126	Timor-Leste	0,51	0,49	0,50	**0,002**	1,000	302.749	**0,02**	0,69	**0,00**
127	Saint Kitts and Nevis	0,42	0,56	0,49	**0,001**	1,000	184.285	**0,01**	0,42	**0,00**
128	Dominica	0,41	0,39	0,40	**0,001**	1,000	185.885	**0,01**	0,43	**0,00**
129	Bhutan	0,31	0,31	0,31	**0,001**	1,000	523.580	**0,04**	1,20	**0,01**
130	Antigua and Barbuda	0,52	0,08	0,30	**0,001**	1,000	58.421	**0,00**	0,13	**0,00**
131	Vanuatu	0,10	0,46	0,28	**0,001**	1,000	167.806	**0,01**	0,38	**0,00**
132	Saint Vincent and the G	0,41	0,15	0,28	**0,001**	1,000	526.039	**0,04**	1,20	**0,01**
133	Samoa	0,19	0,31	0,25	**0,001**	1,000	167.806	**0,01**	0,38	**0,00**
134	Marshall Islands	0,19	0,25	0,22	**0,001**	1,000	127.690	**0,01**	0,29	**0,00**
135	Palau	0,14	0,19	0,16	**0,000**	1,000	135.600	**0,01**	0,31	**0,00**
136	Uganda	0,01	0,29	0,15	**0,000**	1,000	182.685	**0,01**	0,42	**0,00**
137	Tonga	0,13	0,15	0,14	**0,000**	1,000	143.511	**0,01**	0,33	**0,00**
138	Micronesia (Federated	0,09	0,18	0,14	**0,000**	1,000	126.560	**0,01**	0,29	**0,00**
139	Comoros	0,14	0,14	0,14	**0,000**	1,000	180.800	**0,01**	0,41	**0,00**
140	Tuvalu	0,09	0,09	0,09	**0,000**	1,000	103.960	**0,01**	0,24	**0,00**
141	Kiribati	0,04	0,07	0,05	**0,000**	1,000	123.171	**0,01**	0,28	**0,00**
142	Cook Islands	0,03	0,07	0,05	**0,000**	1,000	111.871	**0,01**	0,26	**0,00**
143	Nauru	0,01	0,01	0,01	**0,000**	1,000	83.620	**0,01**	0,19	**0,00**
144	Niue	0,00	0,02	0,01	**0,000**	1,000	82.490	**0,01**	0,19	**0,00**
		457,74	465,86	461,80	**1,392**		42.238.900		95,21	
	Croatia	(extra)					1.173.786		7,50	
	Region ASP	(extra)					322.050		0,74	

Table A1-9 HCFC baseline consumption levels for the non LVC countries, percentages in the total, as well as percentage funding and ODP tonnes approved per party in total (see other tables in Annex to Chapter 2) (total funding approved for all countries including Croatia and Region ASP equals US$ 1,384,044,113, with tranches for the entire period 2009-2026, plus a small amount for 2030-2031)

Annex 2 Approved and planned funding tranches for 2017-2020 and the related numbers for ODP tonnes

Table Annex 2-1A Numbers for non-Article 5 countries for approved and planned funding disbursements and related ODP tonnes (per country, for separate activities); totals given at the end

		ODP tonnes approved all (I and II - ExC 77)								Funding approved in principle (plus HPMP II)							Funding planned for HPMP II (all planned)						ODP tonnes BP plan (HPMP II planned)											TOTAL 1-1-2021	
Country	Target		Chem	Total	Appr	Remain	Appr perc			Country		2017	2018	2019	2020		Country		2017	2018	2019	2020		Country	Chem	2017	2018	2019	2020	Base	App 17-2(	App total	Remain	Perc appr	Appr
Afghanistan	35,00	2020	HCFC-22	23,8	8,33	15,47	**35,00**	**8,33**	23,8	Afghanistan	Germany	93.790			31.952									Afghanistan	HCFC-22					23,8	0	8,33	15,47	**35,00**	**8,33**
											UNEP	135.600			46.132																				
Algeria	20,00	2017	HCFC-141b	5,7	3,97	1,73	**69,65**			Algeria														Algeria	HCFC-141b		5,36			5,7	5,36	9,33	-3,63	**163,68**	
Algeria	20,00	2017	141bPolyol	5,36	0,00	5,36	**0,00**			Algeria														Algeria	141bPolyol					5,36	0	0	5,36	-	
Algeria	20,00	2017	HCFC-22	24,50	10,51	13,99	**42,90**			Algeria	UNIDO	154.800	43.098				Algeria	UNIDO		1719863		1240503		Algeria	HCFC-22		10,23		9,53	24,50	19,76	30,27	-5,77	**123,55**	
				35,56	14,48	21,08	**40,72**	**14,48**	35,56																	0,00	15,59	0,00	9,53	35,56	25,12	39,60	-4,04	**111,36**	**39,60**
Argentina	18,00	2017	HCFC-123	1,57	0,00	1,57	**0,00**			Argentina														Argentina	HCFC-123					1,57	0	0	1,57	-	
Argentina	18,00	2017	HCFC-22	266,20	59,57	206,63	**22,38**			Argentina														Argentina	HCFC-22	10		15		266,20	25	84,57	181,63	**31,77**	
Argentina	18,00	2017	HCFC-141b	94,57	23,96	70,61	**25,34**			Argentina														Argentina	HCFC-141b	6,5736	19,713	19,71	19,713	94,57	65,7111	89,6711	4,90	**94,82**	
Argentina	18,00	2017	HCFC-124	0,83	0,00	0,83	**0,00**			Argentina														Argentina	HCFC-124					0,83	0	0	0,83	-	
Argentina	18,00	2017	HCFC-142b	14,34	0,00	14,34	**0,00**			Argentina	UNIDO	133.750					Argentina	IBRD	1756400	2431801	3832501	1627200		Argentina	HCFC-142b	1,3464	4,0375	4,038	4,0375	14,34	13,4589	13,4589	0,88	**93,86**	
				377,51	83,53	293,98	**22,13**	**83,53**	377,51																	17,92	23,75	38,75	23,75	377,51	104,17	187,70	189,81	**49,72**	**187,70**
Bahrain	42,00	2020	141bPolyol	10,11	0,00	10,11	**0,00**			Bahrain														Bahrain	141bPolyol					10,11	0	0	10,11	-	
Bahrain	42,00	2020	HCFC-22	51,46	22,77	28,69	**44,25**			Bahrain	UNEP	141.250	62.150		28.250		Bahrain	UNEP	0	0	0	197.236		Bahrain	HCFC-22	5,5			2	51,46	7,5	30,27	21,19	**58,82**	
Bahrain	42,00	2020	HCFC-141b	0,44	0,44	0,00	**100,00**			Bahrain	UNIDO	1.002.211	770.811		141.775		Bahrain	extra fund	838.000					Bahrain	HCFC-141b					0,44	0	0,44	0	**100,00**	
				62,01	23,21	38,80	**37,43**	**23,21**	62,01																	5,50	0,00	0,00	2,00	62,01	7,5	30,71	31,3	**49,52**	**30,71**
Bangladesh	30,00	2018	HCFC-124	0,07	0,07	0,00	**100,00**			Bangladesh														Bangladesh	HCFC-124					0,07	0	0,07	0	**100,00**	
Bangladesh	30,00	2018	HCFC-141b	21,23	20,20	1,03	**95,15**			Bangladesh														Bangladesh	HCFC-141b					21,23	0	20,2	1,03	**95,15**	
Bangladesh	30,00	2018	HCFC-123	0,21	0,21	0,00	**100,00**			Bangladesh														Bangladesh	HCFC-123					0,21	0	0,21	0	**100,00**	
Bangladesh	30,00	2018	HCFC-22	45,42	3,48	41,94	**7,66**			Bangladesh							Bangladesh	UNDP/UI	372.173	629.130	279.130	0		Bangladesh	HCFC-22	2,41	5,82	1,81	0	45,42	10,04	13,52	31,9	**29,77**	
Bangladesh	30,00	2018	HCFC-142b	5,72	0,57	5,15	**9,97**			Bangladesh	UNEP	20.340	19.210											Bangladesh	HCFC-142b					5,72	0	0,57	5,15	**9,97**	
				72,65	24,53	48,12	**33,76**	**24,53**	72,65																	2,41	5,82	1,81	0,00	72,65	10,04	34,57	38,08	**47,58**	**34,57**
																		UNEP				132210													
Benin	35,00	2020	HCFC-22	23,80	8,33	15,47	**35,00**	**8,33**	23,8	Benin	UNEP		73.450		67.800		Benin	UNIDO	0	0	125.190	187.785		Benin	HCFC-22			1,34	5,88	23,80	7,22	15,55	8,25	**65,34**	**15,55**
Brazil	45,00	2021	HCFC-142b	5,61	0,00	5,61	**0,00**			Brazil														Brazil	HCFC-142b					5,61	0	0	5,61	-	
Brazil	45,00	2021	HCFC-22	792,00	214,66	577,34	**27,10**			Brazil	Germany	763.435	4.293.637		1.116.345									Brazil	HCFC-22					792,00	0	214,66	577,34	**27,10**	
Brazil	45,00	2021	HCFC-141b	521,70	469,70	52,00	**90,03**			Brazil	Italy													Brazil	HCFC-141b					521,70	0	469,7	52	**90,03**	
Brazil	45,00	2021	HCFC-124	7,73	0,00	7,73	**0,00**			Brazil	UNDP	4.416.643	8.740.184		1.492.650									Brazil	HCFC-124					7,73	0	0	7,73	-	
Brazil	45,00	2021	HCFC-123	0,30	0,00	0,30	**0,00**			Brazil	UNIDO		6.869.442		3.045.630									Brazil	HCFC-123					0,30	0	0	0,3	-	
				######	684,36	642,98	**51,56**	**684,36**	1327,3																	0,00	0,00	0,00	0,00	1.327,34	0	684,36	642,98	**51,56**	**684,36**
																		UNEP				197236													
Burkina Faso	35,00	2020	HCFC-22	28,90	10,11	18,79	**34,98**	**10,11**	28,9	Burkina Faso	UNEP	142.493	113.000		90.477		Burkina Faso	UNIDO	0	0	186.764	233.455		Burkina Faso	HCFC-22			2	4,5	28,90	6,5	16,61	12,29	**57,47**	**16,61**

Cameroon	20,00	2015	HCFC-22	66,76	9,70	57,06	**14,53**			Cameroon						Cameroon	UNIDO	1.128.038	0	373.527	373.527	Cameroon	HCFC-22	12,08		4	4	66,76	20,08	29,78	36,98	**44,61**			
Cameroon	20,00	2015	HCFC-141b	10,80	10,80	0,00	**100,00**			Cameroon	UNIDO	63.571				Cameroon						Cameroon	HCFC-141b					10,80	0	10,8	0	**100,00**			
				77,56	9,70	57,06	**12,51**	**9,70**	77,56															12,08	0	4	4	77,56	20,08	40,58	36,98	**52,32**	**40,58**		
Chile	65,00	2021	HCFC-225	0,30	0,00	0,30	**0,00**			Chile												Chile	HCFC-225					0,30	0	0	0,3	-			
Chile	65,00	2021	HCFC-22	47,30	32,22	15,08	**68,12**			Chile												Chile	HCFC-22					47,30	0	32,22	15,08	**68,12**			
Chile	65,00	2021	HCFC-142b	0,60	0,00	0,60	**0,00**			Chile												Chile	HCFC-142b					0,60	0	0	0,6	-			
Chile	65,00	2021	HCFC-141b	39,30	39,30	0,00	**100,00**			Chile	UNDP		1.500.045		45.133							Chile	HCFC-141b					39,30	0	39,3	0	**100,00**			
Chile	65,00	2021	HCFC-123	0,00	0,00	0,00				Chile	UNEP		147.987		24.664							Chile	HCFC-123					0,00	0	0	0				
Chile	65,00	2021	HCFC-124	0,00	0,00	0,00				Chile	UNIDO		661.709		110.285							Chile	HCFC-124					0,00	0	0	0				
				87,50	71,52	15,98	**81,74**	**71,52**	87,5															0	0	0	0	87,50	0,00	71,52	15,98	**81,74**	**71,52**		
China										China	Germany	267.386		356.514																						
China										China	Germany		300.000	200.000	200.000																					
China										China	IBRD	7.658.827	11.177.839	9.947.351	9.744.069																					
China										China	Italy																									
China	37,60	2020	HCFC-124	3,07	0,00	3,07	**0,00**			China	Japan	80.000	80.000	80.000	80.000							China	HCFC-124					3,07	0	0	3,07	-			
China	37,60	2020	HCFC-123	10,13	2,70	7,43	**26,65**			China	UNDP	########	12.321.512	13.932.076	10.715.112							China	HCFC-123					10,13	0	2,7	7,43	**53,31**			
China	37,60	2020	HCFC-141b	######	######	0,00	**100,00**			China	UNDP	3.536.687	3.358.024	3.379.822	3.675.861							China	HCFC-141b					5.885,18	0	5885,18	-	**200,00**			
China	37,60	2020	HCFC-22	######	######	#####	**46,62**			China	UNEP	4.530.995	3.189.072	2.873.149	2.885.086							China	HCFC-22					11.495,31	0	5359,4	#####	**93,25**			
China	37,60	2020	225ca	1,22	1,22	0,00	**100,00**			China	UNIDO	9.162.874	11.923.302	13.827.926	13.994.594							China	HCFC-225ca					1,22	0	1,22	-				
China	37,60	2020	HCFC-142b	######	912,97	557,56	**62,08**			China	UNIDO	########	11.760.181	14.582.193	18.256.362							China	HCFC-142b					1.470,53	0	912,969	557,56				
				######	######	#####	**64,46**	**12161,47**	18865															0	0	0	0	18.865,44	0,00	#######	######	**64,46**	**12161,47**		
Colombia	65,00	2021	HCFC-141b	151,70	151,70	0,00	**100,00**			Colombia												Colombia	HCFC-141b					151,70	0	151,7	0	**100,00**			
Colombia	65,00	2021	HCFC-123	2,20	0,00	2,20	**0,00**			Colombia												Colombia	HCFC-123					2,20	0	0	2,2	-			
Colombia	65,00	2021	HCFC-124	0,04	0,00	0,04	**0,00**			Colombia	Germany		183.819									Colombia	HCFC-124					0,04	0	0	0,04	-			
Colombia	65,00	2021	HCFC-22	71,10	49,51	21,59	**69,63**			Colombia	UNDP		1.356.768	680.251								Colombia	HCFC-22					71,10	0	49,51	21,59	**69,63**			
Colombia	65,00	2021	HCFC-142b	0,50	0,00	0,50	**0,00**			Colombia	UNEP		56.500	56.500								Colombia	HCFC-142b					0,50	0	0	0,5	-			
				225,54	201,21	24,33	**89,21**	**201,21**	225,54															0,00	0,00	0,00	0,00	225,54	0	201,21	24,33	**89,21**	**201,21**		
Congo, DR	10,00	2015	HCFC-22	58,00	5,80	52,20	**10,00**	**5,80**		Congo, DR	UNDP	26.160				Congo, DR	UNEP/UI	0	338.338	14.126	211.200	Congo, DR	HCFC-22	5,3	6,34	0,44	2,42	58,00	14,5	20,3	37,7	**35,00**	**20,30**		
											UNEP	26.555				Congo, DR	Extra						extra													
Cote d'Ivoire	35,00	2020	HCFC-22	63,80	22,33	41,47	**35,00**	**22,33**	63,8	Cote d'Ivoire	UNEP	168.156	145.735		208.222	Cote d'Ivoire		0	0	0	803.029	Cote d'Ivoire	HCFC-22				8,38	63,80	8,38	30,71	33,09	**48,13**	**30,71**		
											UNIDO	492.200																								
Republic	40,00	2020	HCFC-141b	0,60	0,60	0,00	**100,00**			Dominican R.												Dominican R.	HCFC-141b					0,60	0	0,6	0	**100,00**			
Republic	40,00	2020	141bPolyol	19,51	19,51	0,00	**100,00**			Dominican R.												Dominican R.	141bPolyol					19,51	0	19,51	0	**100,00**			
Republic	40,00	2020	HCFC-123	0,19	0,00	0,19	**0,00**			Dominican R.	UNDP		614.394		156.817							Dominican R.	HCFC-123					0,19	0	0	0,19	-			
Republic	40,00	2020	HCFC-22	50,41	22,39	28,02	**44,42**			Dominican R.	UNEP		113.000									Dominican R.	HCFC-22					50,41	0	22,39	28,02	**44,42**			
				70,71	42,50	28,21	**60,10**	**42,50**	70,71															0	0	0	0	70,71	0	42,5	28,21	**60,10**	**42,50**		

Ecuador	35,00	2020	HCFC-142b	1,20	0,00	1,20	**0,00**			Ecuador														Ecuador	HCFC-142b					1,20	0	0	1,2	-				
Ecuador	35,00	2020	HCFC-141b	0,86	0,86	0,00	**100,00**			Ecuador									388794					Ecuador	HCFC-141b		5,71			0,86	5,71	6,57	-5,71	**763,95**				
Ecuador	35,00	2020	HCFC-22	21,02	7,36	13,66	**35,01**			Ecuador														Ecuador	HCFC-22				3,5	21,02	3,5	10,86	10,16	**51,67**				
Ecuador	35,00	2020	HCFC-123	0,18	0,00	0,18	**0,00**			Ecuador	UNEP		28.250		11.300	Ecuador		0	0	0	334.691	Ecuador	HCFC-123					0,18	0	0	0,18	-				
Ecuador	35,00	2020	141bPolyol	20,67	14,96	5,71	**72,38**			Ecuador	UNIDO		92.987		59.125							Ecuador	141bPolyol					20,67	0	14,96	5,71	**72,38**				
				43,93	23,18	20,75	**52,77**	**23,18**	43,93																	0,00	5,71	0,00	3,50	43,93	9,21	32,39	11,54	**73,73**	**32,39**			
Egypt	25,00	2018	HCFC-142b	16,36	0,00	16,36	**0,00**			Egypt												Egypt	HCFC-142b	13,955		28,68		16,36	42,635	42,635	-26,28	**260,61**				
Egypt	25,00	2018	HCFC-123	0,11	0,00	0,11	**0,00**			Egypt												Egypt	HCFC-123					0,11	0	0	0,11	-				
Egypt	25,00	2018	HCFC-141b	129,61	95,69	33,92	**73,83**			Egypt												Egypt	HCFC-141b		7,5			129,61	7,5	103,19	26,42	**79,62**				
Egypt	25,00	2018	HCFC-124	0,00	0,00	0,00				Egypt												Egypt	HCFC-124					0,00	0	0	-					
Egypt	25,00	2018	HCFC-22	240,19	6,13	234,06	**2,55**			Egypt	UNDP		770.130			Egypt	Various	2.250.424	7.792.328	4.321.965	2.967.247	Egypt	HCFC-22	13,955	51,37	28,68	22,01	240,19	116,015	122,145	118,05	**50,85**				
Egypt	25,00	2018	141bPolyol	98,34	72,18	26,16	**73,40**			Egypt	UNIDO		250.018									Egypt	141bPolyol					98,34	0	0	26,16	-				
				484,61	174,00	310,61	**35,91**	**174,00**	484,61															27,91	58,87	57,36	22,01	484,61	166,15	267,97	144,46	**55,30**	**267,97**			
											UNEP	56.613	56.500		61.020																								
Gabon	35,00	2020	HCFC-22	30,20	10,57	19,63	**35,00**	**10,57**	30,2	Gabon	UNIDO	130.691				Gabon	UNEP/UN	0	0	0	384.000	Gabon	HCFC-22				4	30,20	4	14,57	15,63	**48,25**	**14,57**			
Ghana	35,00	2020	HCFC-22	42,60	14,70	27,90	**34,51**			Ghana	Italy		67.800			Ghana	UNDP	0	0	0	521.818	Ghana	HCFC-22				5,59	42,60	5,59	20,29	22,31	**47,63**				
Ghana	35,00	2020	HCFC-142b	14,70	5,35	9,35	**36,39**			Ghana	UNDP		134.375	130.409								Ghana	HCFC-142b					14,70	0	5,35	9,35	**36,39**				
				57,30	20,05	37,25	**34,99**	**20,05**	57,3															0	0	0	5,59	57,30		25,64	31,66	**44,75**	**25,64**			
										Guinea	73.450	56.500		75.710																								
Guinea	35,00	2020	HCFC-22	22,60	7,91	14,69	**35,00**	**7,91**	22,6	Guinea	172.000					Guinea	UNEP/UN	0	0	0	302.645	Guinea	HCFC-22				3,17	22,60	3,17	11,08	11,52	**49,03**	**11,08**			
India	60,00	2023	HCFC-124	13,50	0,00	13,50	**0,00**			India												India	HCFC-124					13,50	0	0	13,50	-				
India	60,00	2023	HCFC-22	602,00	162,71	439,29	**27,03**			India												India	HCFC-22					602,00	0	162,71	439,29	**27,03**				
India	60,00	2023	HCFC-142b	123,70	0,00	123,70	**0,00**			India												India	HCFC-142b					123,70	0	0	123,70	-				
India	60,00	2023	HCFC-123	3,50	0,00	3,50	**0,00**			India	Germany		2.223.922		1.667.941							India	HCFC-123					3,50	0	0	3,50	-				
India	60,00	2023	141bPolyol	83,05	83,05	0,00	**100,00**			India	UNDP		15.630.560		12.888.685							India	141bPolyol					83,05	0	83,05	-	**100,00**				
India	60,00	2023	HCFC-141b	865,50	865,50	0,00	**100,00**			India	UNEP		336.333		235.433							India	HCFC-141b					865,50	0	865,5	-	**100,00**				
				######	######	579,99	**65,71**	**1111,26**	1691,3															0	0	0	0	1.691,25	0,00	1.111,26	579,99	**65,71**	**1111,26**			
Indonesia	55,00	2023	HCFC-141b	132,60	132,60	0,00	**100,00**			Indonesia												Indonesia	HCFC-141b					132,60	0	132,6	0	**100,00**				
Indonesia	55,00	2023	HCFC-22	267,40	86,73	180,67	**32,43**			Indonesia												Indonesia	HCFC-22					267,40	0	86,73	180,67	**32,43**				
Indonesia	55,00	2023	HCFC-225	0,02	0,00	0,02	**0,00**			Indonesia	IBRD		1.365.907									Indonesia	HCFC-225					0,02	0	0	0,02	-				
Indonesia	55,00	2023	HCFC-123	3,80	0,00	3,80	**0,00**			Indonesia	UNDP		806.245									Indonesia	HCFC-123					3,80	0	0	3,8	-				
				403,82	219,33	184,49	**54,31**	**219,33**	403,82															0	0	0	0	403,82	0	219,33	184,49	**54,31**	**219,33**			

											Germany		1.166.127		317.426																									
											Italy		565.000																											
											UNDP		1.705.559		1.399.539																									
Iran	75,00	2023	HCFC-22	163,60	109,87	53,73	**67,16**			Iran	UNEP		213.614		191.129										Iran	HCFC-22					163,60	0	109,87	53,73	**67,16**			
Iran	75,00	2023	HCFC-141b	216,90	216,90	0,00	**100,00**			Iran	UNIDO		624.880		560.680										Iran	HCFC-141b					216,90	0	216,9	0	**100,00**			
				380,50	326,77	53,73	**85,88**	**326,77**	380,5																		0	0	0	0	380,50		326,77	53,73	**85,88**	**326,77**		
											UNEP	247.634																											
											UNIDO	225.750																											
Iraq	14,00	2017	HCFC-22	108,38	14,98	93,40	**13,82**	**14,98**	108,38	Iraq							Iraq	UNEP/UN	1.589.160	0	493.091	466.909		Iraq	HCFC-22	13,85		5	5	108,38	23,85	38,83	69,55	**35,83**	**38,83**		
Jordan	50,00	2022	HCFC-141b	28,79	28,79	0,00	**100,00**			Jordan														Jordan	HCFC-141b					28,79	0	28,79	0	**100,00**			
Jordan	50,00	2022	141bPolyol	11,31	11,31	0,00	**100,00**			Jordan	IBRD		1.084.503											Jordan	141bPolyol					11,31	0	11,31	0	**100,00**			
Jordan	50,00	2022	HCFC-22	54,19	30,20	23,99	**55,73**			Jordan	UNIDO		578.708											Jordan	HCFC-22					54,19	0	30,2	23,99	**55,73**			
				94,29	70,30	23,99	**74,56**	**70,30**	94,29																0,00	0,00	0,00	0,00	94,29	0	70,3	23,99	**74,56**	**70,30**		
Kenya	21,00	2017	HCFC-22	52,20	11,00	41,20	**21,07**	**11,00**	52,2	Kenya	France	100.900												Kenya	HCFC-22					52,20	0	11	41,2	**21,07**	**11,00**		
Korea, DPR	15,00	2018	HCFC-141b	16,00	16,00	0,00	**100,00**			Korea, DPR														Korea, DPR	HCFC-141b					16,00	0	16	0	**100,00**			
Korea, DPR	15,00	2018	HCFC-22	62,00	4,03	57,97	**6,50**			Korea, DPR	UNIDO		42.800			Korea, DPR	UNIDO		1284000		466909		Korea, DPR	HCFC-22		10			62,00	10	14,03	47,97	**22,63**			
				78,00	20,03	57,97	**25,68**	**20,03**	78																0	10	0	0	78,00		30,03	47,97	**38,50**	**30,03**		
Kuwait	39,00	2018	HCFC-123	0,30	0,00	0,30	**0,00**			Kuwait														Kuwait	HCFC-123					0,30	0	0	0,3	-			
Kuwait	39,00	2018	141bPolyol	10,64	0,00	10,64	**0,00**			Kuwait														Kuwait	141bPolyol					10,64	0	0	10,64	-			
Kuwait	39,00	2018	HCFC-22	260,50	81,25	179,25	**31,19**			Kuwait						Kuwait	UNIDO	0	3.824.730	0	861.389		Kuwait	HCFC-22		22,7		9	260,50	31,7	112,95	147,55	**43,36**			
Kuwait	39,00	2018	HCFC-142b	82,70	82,70	0,00	**100,00**			Kuwait	UNEP	371.703	108.600											Kuwait	HCFC-142b					82,70	0	82,7	0	**100,00**			
Kuwait	39,00	2018	HCFC-141b	75,20	75,20	0,00	**100,00**			Kuwait	UNIDO	1.128.684	984.400			Kuwait	UNIDO		724.487				Kuwait	HCFC-141b		10,64			75,20	10,64	85,84	-10,64	**114,15**			
				429,34	239,15	190,19	**55,70**	**239,15**	429,34																0,00	33,34	0,00	9,00	429,34	42,34	281,49	147,85	**65,56**	**281,49**		
Lebanon	75,00	2025	HCFC-123	0,05	0,00	0,05	**0,00**			Lebanon														Lebanon	HCFC-123					0,05	0	0	0,05	-			
Lebanon	75,00	2025	HCFC-141b	37,53	37,53	0,00	**100,00**			Lebanon	UNDP	134.117												Lebanon	HCFC-141b					37,53	0	37,53	0	**100,00**			
Lebanon	75,00	2025	HCFC-22	35,95	23,63	12,32	**65,73**			Lebanon	UNDP		1.191.980											Lebanon	HCFC-22					35,95	0	23,63	12,32	**65,73**			
				73,53	61,16	12,37	**83,18**	**61,16**	73,53																0,00	0,00	0,00	0,00	73,53	0	61,16	12,37	**83,18**	**61,16**		
Libya	10,00	2018	HCFC-22	82,52	2,67	79,85	**3,24**			Libya						Libyan Arab Ja	UNIDO			466,909			Libya	HCFC-22			5		82,52	5	7,67	74,85	**9,29**			
Libya	10,00	2018	HCFC-141b	31,14	23,84	7,30	**76,56**			Libya	UNIDO		204.255			Libyan Arab Jamahiriya		0	0	497.050	0		Libya	HCFC-141b			7,3		31,14	7,3	31,14	0	**100,00**			
				113,66	26,51	87,15	**23,32**	**26,51**	113,66																0	0	12,3	0	113,66		38,81	74,85	**34,15**	**38,81**		
Madagascar	35,00	2020	HCFC-22	17,10	6,00	11,10	**35,09**	**6,00**	17,1	Madagascar	UNEP		49.720		63.280	Madagascar	UNEP/UN	0	0	0	193.135		Madagascar	HCFC-22				2,45	17,10	2,45	8,45	8,65	**49,42**	**8,45**		

Malaysia	42,90	2022	HCFC-22	349,54	94,08	255,46	**26,92**		
Malaysia	42,90	2022	HCFC-141b	162,54	161,54	1,00	**99,38**		
Malaysia	42,90	2022	HCFC-141	0,94	0,94	0,00	**100,00**		
Malaysia	42,90	2022	HCFC-21	0,74	0,74	0,00	**100,00**		
Malaysia	42,90	2022	HCFC-142b	0,79	0,79	0,00	**100,00**		
Malaysia	42,90	2022	HCFC-225	0,08	0,00	0,08	**0,00**		
Malaysia	42,90	2022	HCFC-123	1,13	1,13	0,00	**100,00**		
				515,76	259,22	256,54	**50,26**	**259,22**	515,76
Mauritania			HCFC-22	20,40	0,00	20,40	**0,00**	**0,00**	20,4
Mexico	67,50	2022	HCFC-123	30,20	10,57	19,63	**35,00**		
Mexico	67,50	2022	HCFC-22	392,80	130,30	262,50	**33,17**		
Mexico	67,50	2022	HCFC-124	0,10	0,00	0,10	**0,00**		
Mexico	67,50	2022	HCFC-142b	1,00	0,00	1,00	**0,00**		
Mexico	67,50	2022	HCFC-141b	820,60	820,60	0,00	**100,00**		
				######	961,47	283,23	**77,25**	**961,47**	1244,7
Morocco	20,00	2017	HCFC-141b	22,10	14,20	7,90	**64,25**		
Morocco	20,00	2017	HCFC-22	45,90	2,57	43,33	**5,60**		
				68,00	14,20	7,90	**20,88**	**14,20**	68
Nigeria	10,00	2015	HCFC-141b	149,60	79,50	70,10	**53,14**		
Nigeria	10,00	2015	HCFC-22	248,50	10,60	237,90	**4,27**		
				398,10	79,50	70,10	**19,97**	**79,50**	398,1
Oman	35,00	2020	HCFC-141b	1,11	1,11	0,00	**100,00**		
Oman	35,00	2020	141bPolyol	1,10	1,10	0,00	**100,00**		
Oman	35,00	2020	HCFC-142b	0,79	0,79	0,00	**100,00**		
Oman	35,00	2020	HCFC-22	29,57	9,11	20,46	**30,81**		
				32,57	12,11	20,46	**37,18**	**12,11**	32,57
Pakistan	50,00	2020	HCFC-141b	138,50	130,39	8,11	**94,14**		
Pakistan	50,00	2020	HCFC-22	108,90	21,69	87,21	**19,92**		
				247,40	152,08	95,32	**61,47**	**152,08**	247,4
Panama	35,00	2020	HCFC-123	0,05	0,00	0,05	**0,00**		
Panama	35,00	2020	HCFC-124	0,01	0,00	0,01	**0,00**		
Panama	35,00	2020	HCFC-141b	2,30	2,30	0,00	**100,00**		
Panama	35,00	2020	141bPolyol	2,50	2,50	0,00	**100,00**		
Panama	35,00	2020	HCFC-142b	0,18	0,00	0,18	**0,00**		
Panama	35,00	2020	HCFC-22	22,24	9,09	13,15	**40,87**		
				27,28	13,89	13,39	**50,92**	**13,89**	27,28

Malaysia					
Malaysia					
Malaysia					
Malaysia					
Malaysia					
Malaysia					
Malaysia	UNDP			2.648.491	
Mauritania					
Mexico					
Mexico					
Mexico	UNEP				45.200
Mexico	UNIDO		2.289.499		1.725.215
Mexico	Spain		1.192.731		
Morocco					
Morocco	UNIDO	37.625			
Nigeria					
Nigeria					
Oman					
Oman					
Oman	UNEP		67.235		64.410
Oman	UNIDO		53.500		21.400
Pakistan	UNEP		225.976		116.378
Pakistan	UNIDO		2.118.442		477.990
Panama					
Panama					
Panama					
Panama					
Panama					
Panama	UNDP		412.806		77.847

Mauritania		41.630	0,000	8,000	0,000
Mauritania		85.700	68.500		34.200
Mauritania	UNDP	0	0	0	40.465
Extra needed ?		370.934			
		-370.934			
				``	
Morocco	UNIDO		537911		
Morocco	UNIDO		933818		933818
Nigeria	UNDP/UI	3.313.296	1.238.942	3.099.296	1.199.494

Malaysia	HCFC-22					349,54	0	94,08	255,46	**26,92**	
Malaysia	HCFC-141b					162,54	0	161,54	1,00	**99,38**	
Malaysia	HCFC-141					0,94	0	0,94	-	**100,00**	
Malaysia	HCFC-21					0,74	0	0,74	-	**100,00**	
Malaysia	HCFC-142b					0,79	0	0,79	-	**100,00**	
Malaysia	HCFC-225					0,08	0	0	0,08	**-**	
Malaysia	HCFC-123					1,13	0	1,13	-	**100,00**	
		0	0	0	0	515,76	0,00	259,22	256,54	**50,26**	**259,22**
Mauritania	HCFC-22	5,5	0,741	0,098	0,8	20,40	7,13931	7,13931	13,261	**35,00**	**7,14**
Mexico	HCFC-123					30,20	0	10,57	19,63	**35,00**	
Mexico	HCFC-22					392,80	0	130,3	262,5	**33,17**	
Mexico	HCFC-124					0,10	0	0	0,1	**-**	
Mexico	HCFC-142b					1,00	0	0	1	**-**	
Mexico	HCFC-141b					820,60	0	820,6	0	**100,00**	
		0,00	0,00	0,00	0,00	1.244,70	0	961,47	283,23	**77,25**	**961,47**
Morocco	HCFC-141b		7,9			22,10	7,9	22,1	0	**100,00**	
Morocco	HCFC-22		10		10	45,90	20	22,57	23,33	**49,17**	
		0	17,9	0	10	68,00	27,90	44,67	23,33	**65,69**	**44,67**
Nigeria	HCFC-141b	31,63	8,43	11,58	8,43	149,60	60,07	139,57	10,03	**93,30**	
Nigeria	HCFC-22	17,1	7,1	17,1	6,7	248,50	48	58,6	189,9	**23,58**	
		48,73	15,53	28,68	15,13	398,10		198,17	199,93	**49,78**	**198,17**
Oman	HCFC-141b					1,11	0	1,11	0	**100,00**	
Oman	141bPolyol					1,10	0	1,1	0	**100,00**	
Oman	HCFC-142b					0,79	0	0,79	0	**100,00**	
Oman	HCFC-22					29,57	0	9,11	20,46	**30,81**	
		0	0	0	0	32,57	0	12,11	20,46	**37,18**	**12,11**
Pakistan	HCFC-141b					138,50	0	130,39	8,11	**94,14**	
Pakistan	HCFC-22					108,90	0	21,69	87,21	**19,92**	
						247,40		152,08	95,32	**61,47**	**152,08**
Panama	HCFC-123					0,05		0	0,05	**-**	
Panama	HCFC-124					0,01		0	0,01	**-**	
Panama	HCFC-141b					2,30		2,3	-	**100,00**	
Panama	141bPolyol					2,50		2,5	-	**100,00**	
Panama	HCFC-142b					0,18		0	0,18	**-**	
Panama	HCFC-22					22,24		9,09	13,15	**40,87**	
		0	0	0	0	27,28	0,00	13,89	13,39	**50,92**	**13,89**

Peru	10,00	2016	HCFC-124	0,06	0,00	0,06	**0,00**			Peru													Peru	HCFC-124					0,06	0	0	0,06	-			
Peru	10,00	2016	HCFC-141b	1,79	1,79	0,00	**100,00**			Peru													Peru	HCFC-141b					1,79	0	1,79	0	**100,00**			
Peru	10,00	2016	HCFC-142b	1,18	0,00	1,18	**0,00**			Peru													Peru	HCFC-142b					1,18	0	0	1,18	-			
Peru	10,00	2016	HCFC-22	23,85	1,95	21,90	**8,18**			Peru	UNDP	26.891				Peru	UNDP/UI	264.866	25.000	251.010	0	Peru	HCFC-22	2,96	0,27	2,69		23,85	5,92	7,87	15,98	**33,00**			
Peru	10,00	2016	141bPolyol	0,00	0,00	0,00				Peru	UNEP	5.650										Peru	141bPolyol					0,00	0	0	0				
				26,88	3,74	23,14	**13,91**	**3,74**	26,88															2,96	0,27	2,69	0,00	26,88	5,92	9,66	17,22	**35,94**	**9,66**		
Philippines	10,00	2015	HCFC-141b	51,85	43,00	8,85	**82,93**			Philippines												Philippines	HCFC-141b					51,85	0	43	8,85	**82,93**			
Philippines	10,00	2015	HCFC-22	109,32	2,00	107,32	**1,83**			Philippines						Philippines	IBRD	1.066.717	789.380	789.380	789.380	Philippines	HCFC-22	8,34	4,83	4,83	6,44	109,32	24,44	26,44	82,88	**24,19**			
Philippines	10,00	2015	HCFC-123	1,70	0,00	1,70	**0,00**			Philippines	UNEP	25.990										Philippines	HCFC-123					1,70	0	0	1,7	-			
				162,87	45,00	117,87	**27,63**	**45,00**	162,87															8,34	4,83	4,83	6,44	162,87	24,44	69,44	93,43	**42,64**	**69,44**		
Qatar	20,00	2015	HCFC-142b	12,05	12,05	0,00	**100,00**			Qatar												Qatar	HCFC-142b					12,05	0	12,05	0	**100,00**			
Qatar	20,00	2015	HCFC-22	73,45	45,81	27,64	**62,37**			Qatar	UNEP	169.500	62.150			Qatar	UNEP/UI	0	477.381	477.381	168.087	Qatar	HCFC-22		5	5	1,8	73,45	11,8	57,61	15,84	**78,43**			
Qatar	20,00	2015	HCFC-141b	0,57	0,00	0,57	**0,00**			Qatar	UNIDO	571.935	159.810									Qatar	HCFC-141b					0,57	0	0	0,57	-			
				86,07	57,86	28,21	**67,22**	**57,86**	86,07															0,00	5,00	5,00	1,80	86,07	11,8	69,66	16,41	**80,93**	**69,66**		
Saudi Arabia	35,00	2020	HCFC-123	0,19	0,00	0,19	**0,00**			Saudi Arabia												Saudi Arabia	HCFC-123					0,19	0	0	0,19	-			
Saudi Arabia	35,00	2020	HCFC-141b	341,00	341,00	0,00	**100,00**			Saudi Arabia												Saudi Arabia	HCFC-141b					341,00	0	341	0	**100,00**			
Saudi Arabia	35,00	2020	HCFC-142b	115,86	115,86	0,00	**100,00**			Saudi Arabia	UNEP		138.378									Saudi Arabia	HCFC-142b					115,86	0	115,86	0	**100,00**			
Saudi Arabia	35,00	2020	HCFC-22	######	246,43	765,21	**24,36**			Saudi Arabia	UNIDO	909.500	1.120.691	428.000	198.574	Saudi Arabia	UNEP/UI	0	0	986.182	13.190.182	Saudi Arabia	HCFC-22			10	85	1.011,64	95	341,43	670,21	**33,75**			
				######	703,29	765,40	**47,89**	**703,29**	1468,7															0	0	10	85	1.468,69	95	798,29	670,4	**54,35**	**798,29**		
											UNIDO		21.500		32.250																				
Senegal	35,00	2020	HCFC-22	20,96	7,34	13,62	**35,02**	**7,34**	20,96	Senegal	UNEP		90.400		45.200	Senegal	UNEP/UI	0	0	0	569.311	Senegal	HCFC-22				5,98	20,96	5,98	13,32	7,64	**63,55**	**13,32**		
Somalia	35,00	2020	141bPolyol	1,68	0,00	1,68	**0,00**			Somalia												Somalia	141bPolyol				1,68	1,68	1,68	1,68	0	**100,00**			
Somalia	35,00	2020	HCFC-22	16,42	5,75	10,67	**35,02**			Somalia	UNIDO				42.800	Somalia	UNIDO	0	0	0	282.478	Somalia	HCFC-22				1,8	16,42	1,8	7,55	8,87	**45,98**			
				18,10	5,75	12,35	**31,77**	**5,75**	18,1															0	0	0	3,48	18,10		9,23	8,87	**50,99**	**9,23**		
South Africa	35,00	2020	HCFC-123	0,30	0,00	0,30	**0,00**			South Africa												South Africa	HCFC-123					0,30	0	0	0,3	-			
South Africa	35,00	2020	HCFC-124	(0,70)	0,00	(0,70)	**0,00**			South Africa												South Africa	HCFC-124					(0,70)	0	0	-0,7	-			
South Africa	35,00	2020	HCFC-141b	160,00	160,00	0,00	**100,00**			South Africa												South Africa	HCFC-141b					160,00	0	160	0	**100,00**			
South Africa	35,00	2020	HCFC-142b	(0,80)	0,00	(0,80)	**0,00**			South Africa												South Africa	HCFC-142b					(0,80)	0	0	-0,8	-			
South Africa	35,00	2020	HCFC-22	210,90	16,72	194,18	**7,93**			South Africa	UNIDO	534.585	191.273			South Africa	UNIDO	0	0	2.159.318	0	South Africa	HCFC-22			17,5		210,90	17,5	34,22	176,68	**16,23**			
				369,70	176,72	192,98	**47,80**	**176,72**	369,7															0,00	0,00	17,50	0,00	369,70	17,5	194,22	175,48	**52,53**	**194,22**		
Sudan	75,00	2020	HCFC-141b	39,00	39,00	0,00	**100,00**			Sudan	UNIDO	42.800										Sudan	HCFC-141b					39,00	0	39	0	**100,00**			
Sudan	75,00	2020	HCFC-22	11,60	8,49	3,11	**73,19**			Sudan	UNIDO		353.572		39.286							Sudan	HCFC-22					11,60	0	8,49	3,11	**73,19**			
				50,60	47,49	3,11	**93,85**	**47,49**	50,6															0	0	0	0	50,60		47,49	3,11	**93,85**	**47,49**		

Syria	25,00	2018	HCFC-22	60,50	5,00	55,50	**8,26**		
Syria	25,00	2018	HCFC-142b	6,82	0,00	6,82	**0,00**		
Syria	25,00	2018	141bPolyol	3,25	0,00	3,25	**0,00**		
Syria	25,00	2018	HCFC-141b	67,71	7,90	59,81	**11,67**		
				138,28	12,90	125,38	**9,33**	**12,90**	138,28
Thailand	15,00	2018	HCFC-141b	205,25	151,68	53,57	**73,90**		
Thailand	15,00	2018	HCFC-22	716,57	67,86	648,71	**9,47**		
Thailand	15,00	2018	HCFC-123	3,20	0,00	3,20	**0,00**		
Thailand	15,00	2018	HCFC-225	1,20	0,00	1,20	**0,00**		
Thailand	15,00	2018	HCFC-142b	0,12	0,00	0,12	**0,00**		
Thailand	15,00	2018	HCFC-124	0,08	0,00	0,08	**0,00**		
Thailand	15,00	2018	225cb	0,68	0,00	0,68	**0,00**		
Thailand	15,00	2018	225ca	0,42	0,00	0,42	**0,00**		
Thailand	15,00	2018	141bPolyol	15,68	15,19	0,49	**96,88**		
				943,20	234,73	708,47	**24,89**	**234,73**	943,2
Togo	35,00	2020	HCFC-22	20,57	7,00	13,57	**34,03**	**7,00**	20,57
Tobago	35,00	2020	HCFC-123	0,13	0,13	0,00	**100,00**		
Tobago	35,00	2020	HCFC-124	0,52	0,52	0,00	**100,00**		
Tobago	35,00	2020	HCFC-141b	2,26	2,26	0,00	**100,00**		
Tobago	35,00	2020	HCFC-22	43,06	14,75	28,31	**34,25**		
				45,97	17,66	28,31	**38,42**	**17,66**	45,97
Tunisia	15,00	2018	HCFC-22	39,01	9,26	29,75	**23,74**		
Tunisia	15,00	2018	141bPolyol	5,02	0,00	5,02	**0,00**		
Tunisia	15,00	2018	HCFC-141b	1,61	1,34	0,27	**83,23**		
Tunisia	15,00	2018	HCFC-142b	0,04	0,00	0,04	**0,00**		
				45,68	10,60	35,08	**23,20**	**10,60**	45,68
Turkey	86,40	2017	HCFC-141b	197,10	197,10	0,00	**100,00**		
Turkey	86,40	2017	HCFC-123	0,02	0,00	0,02	**0,00**		
Turkey	86,40	2017	141bPolyol	31,53	31,53	0,00	**100,00**		
Turkey	86,40	2017	HCFC-22	296,30	159,24	137,06	**53,74**		
Turkey	86,40	2017	HCFC-142b	116,40	120,00	(3,60)	**103,09**		
				641,35	507,87	133,48	**79,19**	**507,87**	641,35
Uruguay	35,00	2020	HCFC-22	21,08	7,65	13,43	**36,29**		
Uruguay	35,00	2020	HCFC-124	0,09	0,09	0,00	**100,00**		
Uruguay	35,00	2020	HCFC-123	0,04	0,04	0,00	**100,00**		
Uruguay	35,00	2020	141bPolyol	5,33	5,33	0,00	**100,00**		
Uruguay	35,00	2020	HCFC-142b	0,63	0,63	0,00	**100,00**		
Uruguay	35,00	2020	HCFC-141b	1,49	1,49	0,00	**100,00**		
				28,66	15,23	13,43	**53,14**	**15,23**	28,66

Syria					
Syria					
Syria					
Syria					
Thailand					
Thailand					
Thailand					
Thailand					
Thailand					
Thailand					
Thailand					
Thailand					
Thailand	IBRD	3.277.990	1.070.000	806.384	2.577.181
	UNEP	70.060	45.200		71.190
Togo	UNIDO	161.250			
Tobago					
Tobago					
Tobago					
Tobago	UNDP	155.875			94.600
Tunisia					
Tunisia	France	78.769			
Tunisia	UNEP	16.950			
Tunisia	UNIDO	116.003			
Turkey					
Turkey					
Turkey					
Turkey					
Turkey	UNIDO	1.710.770	1.605.000		
Uruguay					
Uruguay					
Uruguay					
Uruguay					
Uruguay					
Uruguay	UNDP		727.481		119.057

Syria		0,000	90.272,000	0,000	0,000
Syria		0,000	602.328,000	0,000	132.337,000
Thailand	IBRD		784400	784400	784400
Thailand	IBRD		4.472.520	4.441.700	4.445.120
Thailand					
Togo	UNEP/UN	0	0	0	221.345
Trinidad and T	UNDP			496.418	
Tunisia	UNEP/UNIDO		521.450		521.450
Tunisia	UNIDO		340455		
Tunisia					
Turkey	UNEP/UN	739.635	2.801.455	0	2.801.455

Syria	HCFC-22	0,00	27,00	0,00	4,40	60,50	31,4	36,4	24,1	**60,17**	
Syria	HCFC-142b					6,82	0	0	6,82	**-**	
Syria	141bPolyol					3,25	0	0	3,25	**-**	
Syria	HCFC-141b		1,7			67,71	1,7	9,6	58,11	**14,18**	
		0	28,7	0	4,4	138,28	33,1	46	92,28	**33,27**	**46,00**
Thailand	HCFC-141b		12,8	12,8	12,8	205,25	38,4	190,08	15,17	**92,61**	
Thailand	HCFC-22		49,1	49,1	49,1	716,57	147,3	215,16	501,41	**30,03**	
Thailand	HCFC-123		0,4			3,20	0,4	0,4	2,8	**12,50**	
Thailand	HCFC-225					1,20	0	0	1,2	**-**	
Thailand	HCFC-142b					0,12	0	0	0,12	**-**	
Thailand	HCFC-124					0,08	0	0	0,08	**-**	
Thailand	HCFC-225cb					0,68	0	0	0,68	**-**	
Thailand	HCFC-225ca					0,42	0	0	0,42	**-**	
Thailand	141bPolyol					15,68	0	15,19	0,49	**96,88**	
		0	62,3	61,9	61,9	943,20	186,1	420,83	522,37	**44,62**	**420,83**
Togo	HCFC-22				2,32	20,57	2,32	9,32	11,25	**45,31**	**9,32**
Tobago	HCFC-123					0,13	0	0,13	0	**100,00**	
Tobago	HCFC-124					0,52	0	0,52	0	**100,00**	
Tobago	HCFC-141b					2,26	0	2,26	0	**100,00**	
Tobago	HCFC-22			5,32		43,06	5,32	20,07	22,99	**46,61**	
		0	0	5,32	0	45,97	5,32	22,98	22,99	**49,99**	**22,98**
Tunisia	HCFC-22		5,5		5,5	39,01	11	20,26	18,75	**51,94**	
Tunisia	141bPolyol					5,02	0	0	5,02	**-**	
Tunisia	HCFC-141b		5			1,61	5	6,34	-4,73	**393,79**	
Tunisia	HCFC-142b					0,04	0	0	0,04	**-**	
		0	10,5	0	5,5	45,68	16	26,6	19,08	**58,23**	**26,60**
Turkey	HCFC-141b					197,10	0	197,1	0	**100,00**	
Turkey	HCFC-123					0,02	0	0	0,02	**-**	
Turkey	141bPolyol					31,53	0	31,53	0	**100,00**	
Turkey	HCFC-22	7,5	30	0	30	296,30	67,5	226,74	69,56	**76,52**	
Turkey	HCFC-142b					116,40	0	120	-3,6	**103,09**	
		7,50	30,00	0,00	30,00	641,35	67,5	575,37	65,98	**89,71**	**575,37**
Uruguay	HCFC-22					21,08	0	7,65	13,43	**36,29**	
Uruguay	HCFC-124					0,09	0	0,09	0	**100,00**	
Uruguay	HCFC-123					0,04	0	0,04	0	**100,00**	
Uruguay	141bPolyol					5,33	0	5,33	0	**100,00**	
Uruguay	HCFC-142b					0,63	0	0,63	0	**100,00**	
Uruguay	HCFC-141b					1,49	0	1,49	0	**100,00**	
		0	0	0	0	28,66	0,00	15,23	13,43	**53,14**	**15,23**

Venezuela	42,00	2020	HCFC-123	0,07	0,00	0,07	**0,00**			Venezuela													Venezuela	HCFC-123					0,07	0	0	0,07	-						
Venezuela	42,00	2020	HCFC-141b	39,56	39,56	0,00	**100,00**			Venezuela													Venezuela	HCFC-141b					39,56	0	39,56	0	**100,00**						
Venezuela	42,00	2020	141bPolyol	1,91	1,91	0,00	**100,00**			Venezuela													Venezuela	141bPolyol					1,91	0	1,91	0	**100,00**						
Venezuela	42,00	2020	HCFC-142b	5,68	0,00	5,68	**0,00**			Venezuela	UNDP	214.000	214.000	856.000	53.500								Venezuela	HCFC-142b					5,68	0	0	5,68	-						
Venezuela	42,00	2020	HCFC-22	161,63	46,10	115,53	**28,52**			Venezuela	UNIDO	615.250	637.720		209.874								Venezuela	HCFC-22					161,63	0	46,1	115,53	**28,52**						
				208,85	87,57	121,28	**41,93**	**87,57**	208,85																0,00	0,00	0,00	0,00	208,85	0	87,57	121,28	**41,93**	**87,57**					
Vietnam	35,00	2020	HCFC-123	0,16	0,00	0,16	**0,00**			Vietnam													Vietnam	HCFC-123					0,16	0	0	0,16	-						
Vietnam	35,00	2020	HCFC-22	167,15	55,31	111,84	**33,09**			Vietnam													Vietnam	HCFC-22					167,15	0	55,31	111,84	**33,09**						
Vietnam	35,00	2020	HCFC-141b	53,90	53,90	0,00	**100,00**			Vietnam	IBRD	2.331.737	4.045.945	4.700.992	3.133.995								Vietnam	HCFC-141b					53,90	0	53,9	0	**100,00**						
Vietnam	35,00	2020	141bPolyol	164,56	164,56	0,00	**100,00**			Vietnam	Japan	185.297	29.832										Vietnam	141bPolyol					164,56	0	164,56	0	**100,00**						
				385,77	273,77	112,00	**70,97**	**273,77**	385,77																0	0	0	0	385,77	0	273,77	112	**70,97**	**273,77**					
Yemen	15,00	2015	HCFC-22	156,10	62,18	93,92	**39,83**			Yemen						Yemen	UNIDO						Yemen	HCFC-22					156,10	0	62,18	93,92	**39,83**						
Yemen	15,00	2015	HCFC-142b	1,00	0,00	1,00	**0,00**			Yemen													Yemen	HCFC-142b					1,00	0	0	1	-						
Yemen	15,00	2015	HCFC-141b	1,10	1,10	0,00	**100,00**			Yemen						Yemen	UNIDO						Yemen	HCFC-141b					1,10	0	1,1	0	**100,00**						
Yemen	15,00	2015	141bPolyol	17,55	0,00	17,55	**0,00**			Yemen	UNEP	186.450											Yemen	141bPolyol					17,55	0	0	17,55	-						
				175,75	63,28	112,47	**36,01**	**63,28**	175,75							Yemen									0	0	0	0	175,75	0	63,28	112,47	**36,01**	**63,28**					
																	75710																					
								tot	tot			Approved in principle						Planned																					
Subtotal				**%appr.**	**0,594**			**19483,9**	**32815**	Non-LVC		84.003.454	127.087.683	69.486.057	92.834.430	Non-LVC		13.506.840	34.265.845	24.083.339	38.749.505								**appr**	**0,61095**				**20048,3**					
Total										Non-LVC						Total 17-20		**97.510.294**	**161.353.528**	**93.569.396**	**131.583.935**																	

Table Annex 2-1B Numbers for Article 5 countries for approved and planned funding disbursements and related ODP tonnes (per country); totals given at the end, also totals for non LVC plus LVC countries

LVC																																					
Albania	35,00	2020	HCFC-142b	0,29	0,29	0,00	**100,00**			Albania													Albania	HCFC-142b					0,29	0	0,29	0	**100,00**	
Albania	35,00	2020	HCFC-22	5,62	1,80	3,82	**32,03**			Albania	UNEP		9.605		9.605								Albania	HCFC-22				1,01	5,62	1,01	2,81	2,81	**50,00**	
Albania	35,00	2020	HCFC-124	0,01	0,01	0,00	**100,00**			Albania	UNIDO		32.700		25.070	Albania		0	0	0	97.996	Albania	HCFC-124					0,01	0	0,01	0	**100,00**	
				5,92	2,10	3,82	**35,47**	**2,10**	5,92															0,00	0,00	0,00	1,01	5,92	1,01	3,11	2,81	**52,53**	**3,11**
Angola	10,00	2016	HCFC-22	15,95	1,59	14,36	**9,97**	**1,59**	15,95	Angola						Angola		184.896	0	184.896	41.088	Angola	HCFC-22	1,79		1,79	0,4	15,95	3,98	5,57	10,38	**34,92**	**5,57**
Barbuda	35,00	2020	HCFC-22	0,30	0,03	0,27	**10,00**	**0,03**	0,3	Barbuda	UNEP	6.610				Antigua and Barbuda		45.332	15.260	45.332	0	Barbuda	HCFC-22	0,08	0,08	0,08		0,30	0,24	0,27	0,03	**90,00**	**0,27**
Armenia	66,00	2020	HCFC-22	7,00	4,66	2,34	**66,57**			Armenia	UNDP				23.544							Armenia	HCFC-22					7,00	0	4,66	2,34	**66,57**	
Armenia	66,00	2020	141bPolyol	0,83	0,83	0,00	**100,00**			Armenia	UNEP		58.082									Armenia	141bPolyol					0,83	0	0,83	0	**100,00**	
				7,83	5,49	2,34	**70,11**	**5,49**	7,83		UNEP	65.738			35.001									0	0	0	0	7,83		5,49	2,34	**70,11**	**5,49**
ASP Region							**0**			ASP					50.850							ASP											
Bahamas	35,00	2020	HCFC-22	4,81	1,68	3,13	**34,93**	**1,68**	4,81	Bahamas	UNIDO	39.052				Bahamas		0	0	0	116.432	Bahamas	HCFC-22				0,82	4,81	0,82	2,5	2,31	**51,98**	**2,50**
Barbados	35,00	2020	HCFC-142b	0,10	0,00	0,10	**0,00**			Barbados	UNDP	41.420										Barbados	HCFC-142b					0,10	0	0	0,1	-	
Barbados	35,00	2020	HCFC-22	3,60	1,29	2,31	**35,83**			Barbados	UNEP	54.240	47.460		31.640	Barbados		0	0	0	88.140	Barbados	HCFC-22				0,48	3,60	0,48	1,77	1,83	**49,17**	
				3,70	1,29	2,41	**34,86**	**1,29**	3,7															0	0	0	0,48	3,70		1,77	1,93	**47,84**	**1,77**
Belize	35,00	2020	HCFC-141b	0,12	0,04	0,08	**33,33**			Belize	UNDP	7.085										Belize	HCFC-141b					0,12	0	0,04	0,08	**33,33**	
Belize	35,00	2020	HCFC-22	2,68	0,99	1,69	**36,94**			Belize	UNEP	108.480			42.375	Belize		0	0	0	88.140	Belize	HCFC-22				0,38	2,68	0,38	1,37	1,31	**51,12**	
				2,80	1,03	1,77	**36,79**	**1,03**	2,8															0	0	0	0,38	2,80		1,41	1,39	**50,36**	**1,41**
Bhutan	#####	2030	HCFC-22	0,30	0,30	0,00	**100,00**	**0,30**	0,3	Bhutan												Bhutan	HCFC-22					0,30	0	0,3	0	**100,00**	**0,30**
Bolivia	35,00	2020	HCFC-124	0,07	0,07	0,00	**100,00**			Bolivia												Bolivia	HCFC-124					0,07	0	0,07	0	**100,00**	
Bolivia	35,00	2020	HCFC-142b	0,17	0,17	0,00	**100,00**			Bolivia												Bolivia	HCFC-142b					0,17	0	0,17	0	**100,00**	
Bolivia	35,00	2020	HCFC-22	4,89	1,89	3,00	**38,65**			Bolivia												Bolivia	HCFC-22				1,6	4,89	1,6	3,49	1,4	**71,37**	
Bolivia	35,00	2020	141bPolyol	0,60	0,00	0,60	**0,00**			Bolivia												Bolivia	141bPolyol					0,60	0	0	0,6	-	
Bolivia	35,00	2020	HCFC-141b	0,97	0,00	0,97	**0,00**			Bolivia	UNIDO		32.700		34.335	Bolivia		40.855	0	0	110.735	Bolivia	HCFC-141b	0,6				0,97	0,6	0,6	0,37	**61,86**	
				6,70	2,13	4,57	**31,79**	**2,13**	6,7															0,60	0,00	0,00	1,60	6,70	2,2	4,33	2,37	**64,63**	**4,33**
Herzegovina	35,00	2020	HCFC-22	3,20	1,61	1,59	**50,31**			Herzegovina	UNIDO		33.170		32.100							Herzegovina	HCFC-22				1,3	3,20	1,3	2,91	0,29	**90,94**	
Herzegovina	35,00	2020	141bPolyol	3,47	3,47	0,00	**100,00**			Herzegovina												Herzegovina	141bPolyol					3,47	0	3,47	0	**100,00**	
Herzegovina	35,00	2020	HCFC-141b	3,00	3,00	0,00	**100,00**			Herzegovina						Bosnia and Herzegovina		0	0	0	111.102	Herzegovina	HCFC-141b					3,00	0	3	0	**100,00**	
				9,67	8,08	1,59	**83,56**	**8,08**	9,67															0,00	0,00	0,00	1,30	9,67	1,3	9,38	0,29	**97,00**	**9,38**
Botswana	35,00	2020	HCFC-22	11,00	3,85	7,15	**35,00**	**3,85**	11	Botswana	UNEP		101.700		62.150	Botswana		0	0	0	228.800	Botswana	HCFC-22				1,5	11,00	1,5	5,35	5,65	**48,64**	**5,35**
											UNIDO		149.800																						

Darussalam	35,00	2020	HCFC-22	6,10	2,14	3,96	**35,08**	**2,14**	6,1
Burundi	35,00	2020	HCFC-22	7,15	2,50	4,65	**34,97**	**2,50**	7,15
Cambodia	#####	2030	HCFC-22	15,00	15,00	0,00	**100,00**	**15,00**	15
Cape Verde	35,00	2020	HCFC-22	0,25	0,09	0,16	**36,00**	**0,09**	0,25
Republic	35,00	2020	HCFC-22	11,99	4,20	7,79	**35,03**	**4,20**	11,99
Chad	35,00	2020	HCFC-22	16,10	5,63	10,47	**34,97**	**5,63**	16,1
Comoros	35,00	2020	HCFC-22	0,14	0,05	0,09	**35,71**	**0,05**	0,14
Congo	35,00	2020	HCFC-22	8,85	3,55	5,30	**40,11**	**3,55**	8,85
Cook Islands	35,00	2020	HCFC-22	0,04	0,02	0,02	**50,00**	**0,02**	0,04
									0
									0
Costa Rica	35,00	2020	HCFC-142b	0,40	0,40	0,00	**100,00**		0,4
Costa Rica	35,00	2020	HCFC-22	10,00	3,00	7,00	**30,00**		10
Costa Rica	35,00	2020	141bPolyol	18,11	14,00	4,11	**77,31**		18,11
Costa Rica	35,00	2020	HCFC-141b	3,58	1,43	2,15	**39,94**		3,58
Costa Rica	35,00	2020	HCFC-124	0,09	0,09	0,00	**100,00**		0,09
Costa Rica	35,00	2020	HCFC-123	0,01	0,01	0,00	**100,00**		0,01
				32,19	18,93	13,26	**58,81**	**18,93**	32,19
Croatia	#####	2030	HCFC-22	4,30	4,30	0,00	**100,00**		
Croatia	#####	2030	HCFC-141b	3,10	3,10	0,00	**100,00**		
Croatia	#####	2030	HCFC-142b	0,10	0,10	0,00	**100,00**		
				7,50	7,50	0,00	**100,00**	**7,50**	7,5
Cuba	35,00	2020	HCFC-142b	0,02	0,00	0,02	**0,00**		
Cuba	35,00	2020	HCFC-22	14,25	3,31	10,94	**23,23**		
Cuba	35,00	2020	HCFC-124	0,01	0,00	0,01	**0,00**		
Cuba	35,00	2020	HCFC-141b	2,60	2,60	0,00	**100,00**		
Cuba	35,00	2020	141bPolyol	13,35	13,35	0,00	**100,00**		
				30,23	19,26	10,97	**63,71**	**19,26**	30,23

Darussalam	UNDP	35.970			7.194
	UNEP	7.910			28.815
Burundi	UNEP	39.550	32.544		37.516
	UNIDO	87.200			
Cambodia	UNDP			161250	
	UNEP			113000	
Cape Verde	UNEP		33.900		18.080
	UNEP	62.150	83.620	56.500	63.280
African	UNIDO		134.375		
Chad	UNEP		50.850		73450
Comoros	UNEP		33.900		18.080
Congo	UNEP		28.250		39.550
Cook Islands	UNEP				11.187
Costa Rica					
Costa Rica					
Costa Rica					
Costa Rica					
Costa Rica					
Costa Rica	UNDP	113.950		60.200	
Croatia					
Croatia					
Croatia					
Cuba					
Cuba					
Cuba					
Cuba					
Cuba	UNDP		107.500		60.200

Brunei Darussalam		0	0	0	130.342
Burundi		0	0	0	137.085
Cape Verde		0	0	0	117.379
Central African Republic		0	0	0	228.800
Chad		0	0	0	231.053
Comoros		0	0	0	100.309
Congo		0	0	0	144.450
Cook Islands		0	0	0	168.088
		277.130			
Costa Rica		0	0	222.560	69.550
		128289			
Cuba		0	0	0	222.560

Darussalam	HCFC-22				0,8	6,10	0,8	2,94	3,16	**48,20**	**2,94**
Burundi	HCFC-22				1,35	7,15	1,35	3,85	3,3	**53,85**	**3,85**
Cambodia	HCFC-22					15,00	0	15	0	**100,00**	**15,00**
Cape Verde	HCFC-22				0,28	0,25	0,28	0,37	-0,12	**148,00**	**0,37**
Republic	HCFC-22				2,19	11,99	2,19	6,39	5,6	**53,29**	**6,39**
Chad	HCFC-22				2,99	16,10	2,99	8,62	7,48	**53,54**	**8,62**
Comoros	HCFC-22				0,03	0,14	0,03	0,08	0,06	**57,14**	**0,08**
Congo	HCFC-22				1,8	8,85	1,8	5,35	3,5	**60,45**	**5,35**
Cook Islands	HCFC-22				0,02	0,04	0,02	0,04	0	**100,00**	**0,04**
Costa Rica	HCFC-142b					0,40	0	0,4	-	**100,00**	
Costa Rica	HCFC-22				0,57	10,00	0,57	3,57	6,43	**35,70**	
Costa Rica	141bPolyol					18,11	0	14	4,11	**77,31**	
Costa Rica	HCFC-141b	4,07				3,58	4,07	5,5	-1,92	**153,63**	
Costa Rica	HCFC-124					0,09	0	0,09	-	**100,00**	
Costa Rica	HCFC-123					0,01	0	0,01	-	**100,00**	
		4,07	0	0	0,57	32,19	4,64	23,57	8,62	**73,22**	**23,57**
Croatia	HCFC-22					4,30	0	4,3	0	**100,00**	
Croatia	HCFC-141b					3,10	0	3,1	0	**100,00**	
Croatia	HCFC-142b					0,10	0	0,1	0	**100,00**	
		0,00	0,00	0,00	0,00	7,50	0	7,5	0	**100,00**	
Cuba	HCFC-142b					0,02	0	0	0,02	**-**	
Cuba	HCFC-22	1,21			2,2	14,25	3,41	6,72	7,53	**47,16**	
Cuba	HCFC-124					0,01	0	0	0,01	**-**	
Cuba	HCFC-141b					2,60	0	2,6	0	**100,00**	
Cuba	141bPolyol					13,35	0	13,35	0	**100,00**	
		1,21	0,00	0,00	2,20	30,23	3,41	22,67	7,56	**74,99**	**22,67**

Djibouti	35,00	2020	HCFC-22	0,70	0,24	0,46	**34,29**	**0,24**	0,7	Djibouti	UNEP		49.720		23.730	Djibouti		0	0	0	87.387	Djibouti	HCFC-22				0,2	0,70	0,2	0,44	0,26	**62,86**	**0,44**
Dominica	35,00	2020	HCFC-22	0,40	0,08	0,32	**20,00**	**0,08**	0,4	Dominica	UNEP	74.354			18.588	Dominica		0	0	0	78.648	Dominica	HCFC-22				0,1	0,40	0,1	0,18	0,22	**45,00**	**0,18**
									0																									
El Salvador	35,00	2020	HCFC-22	8,15	0,56	7,59	**6,87**		8,15	El Salvador												El Salvador	HCFC-22				1,52	8,15	1,52	2,08	6,07	**25,52**	
El Salvador	35,00	2020	HCFC-142b	0,03	0,03	0,00	**100,00**		0,03	El Salvador												El Salvador	HCFC-142b					0,03	0	0,03	-	**100,00**	
El Salvador	35,00	2020	HCFC-124	0,11	0,11	0,00	**100,00**		0,11	El Salvador												El Salvador	HCFC-124					0,11	0	0,11	-	**100,00**	
El Salvador	35,00	2020	HCFC-141b	3,34	3,34	0,00	**100,00**		3,34	El Salvador												El Salvador	HCFC-141b					3,34	0	3,34	-	**100,00**	
El Salvador	35,00	2020	HCFC-123	0,05	0,05	0,00	**100,00**		0,05	El Salvador	UNDP				17.200							El Salvador	HCFC-123					0,05	0	0,05	-	**100,00**	
El Salvador	35,00	2020	141bPolyol	4,94	4,94	0,00	**100,00**		4,94	El Salvador	UNEP				19.520	El Salvador		0	0	0	141.330	El Salvador	141bPolyol					4,94	0	4,94	-	**100,00**	
				16,62	9,03	7,59	**54,33**	**9,03**	16,62															0	0	0	1,52	16,62	1,52	10,55	6,07	**117,81**	**10,55**
											UNEP	39.550	33.900		33.900																		
Guinea	35,00	2020	HCFC-22	6,29	2,20	4,09	**34,98**	**2,20**	6,29	Guinea	UNIDO	81.750				Equatorial Guinea		0	0	0	122.265	Guinea	HCFC-22				1,21	6,29	1,21	3,41	2,88	**54,21**	**3,41**
Eritrea	35,00	2020	HCFC-22	1,08	0,38	0,70	**35,19**	**0,38**	1,08	Eritrea	UNEP				23.730	Eritrea		0	0	0	124.250	Eritrea	HCFC-22				0,2	1,08	0,2	0,58	0,5	**53,70**	**0,58**
Ethiopia	35,00	2020	HCFC-22	5,50	1,92	3,58	**34,91**	**1,92**	5,5	Ethiopia	UNEP				39.550	Ethiopia		0	0	0	122.265	Ethiopia	HCFC-22				0,78	5,50	0,78	2,7	2,8	**49,09**	**2,70**
Fiji	35,00	2020	HCFC-142b	0,04	0,04	0,00	**100,00**			Fiji	UNDP				21.745							Fiji	HCFC-142b					0,04	0	0,04	0	**100,00**	
Fiji	35,00	2020	HCFC-22	8,37	2,90	5,47	**34,65**			Fiji	UNEP				13.052							Fiji	HCFC-22				1,51	8,37	1,51	4,41	3,96	**52,69**	
				8,41	2,94	5,47	**34,96**	**2,94**	8,41							Fiji		0	0	0	160.617			0	0	0	1,51	8,41		4,45	3,96	**52,91**	**4,45**
Gambia	35,00	2020	HCFC-22	1,50	0,52	0,98	**34,67**	**0,52**	1,5	Gambia	UNEP		23.730		23.730	Gambia		0	0	0	91.541	Gambia	HCFC-22				0,15	1,50	0,15	0,67	0,83	**44,67**	**0,67**
Georgia	35,00	2020	HCFC-142b	0,72	0,72	0,00	**100,00**			Georgia												Georgia	HCFC-142b					0,72	0	0,72	0	**100,00**	
Georgia	35,00	2020	HCFC-22	4,57	1,61	2,96	**35,23**			Georgia	UNDP	128.355			33.863							Georgia	HCFC-22				0,69	4,57	0,69	2,3	2,27	**50,33**	
				5,29	2,33	2,96	**44,05**	**2,33**	5,29							Georgia		0	0	0	46.478			0	0	0	0,69	5,29		3,02	2,27	**57,09**	**3,02**
Grenada	35,00	2020	HCFC-22	0,58	0,20	0,38	**34,48**	**0,20**	0,58	Grenada	UNEP				23.730	Grenada		0	0	0	100.429	Grenada	HCFC-22				0,16	0,58	0,16	0,36	0,22	**62,07**	**0,36**
Guatemala	35,00	2020	HCFC-22	6,90	1,80	5,10	**26,09**			Guatemala												Guatemala	HCFC-22				1,37	6,90	1,37	3,17	3,73	**45,94**	
Guatemala	35,00	2020	141bPolyol	1,40	1,40	0,00	**100,00**			Guatemala												Guatemala	141bPolyol					1,40	0	1,4	0	**100,00**	
Guatemala	35,00	2020	HCFC-142b	0,10	0,00	0,10	**0,00**			Guatemala												Guatemala	HCFC-142b					0,10	0	0	0,1	-	
Guatemala	35,00	2020	HCFC-124	0,20	0,00	0,20	**0,00**			Guatemala	UNEP		26.273									Guatemala	HCFC-124					0,20	0	0	0,2	-	
Guatemala	35,00	2020	HCFC-141b	1,10	1,10	0,00	**100,00**			Guatemala	UNIDO		46.064		35.475	Guatemala		0	0	0	88.155	Guatemala	HCFC-141b					1,10	0	1,1	0	**100,00**	
				9,70	4,30	5,40	**44,33**	**4,30**	9,7															0,00	0,00	0,00	1,37	9,70	1,37	5,67	4,03	**58,45**	**5,67**

Bissau	35,00	2020	HCFC-22	2,83	0,99	1,84	**34,98**	**0,99**	2,83	Bissau	UNEP				31.640	Guinea-Bissau			0	0	0	108.680	Guinea-Bissau	HCFC-22				0,47	2,83	0,47	1,46	1,37	**51,59**	**1,46**
											UNDP		71.423																											
Guyana	#####	2025	HCFC-22	1,80	1,80	0,00	**100,00**	**1,80**	1,8	Guyana	UNEP		74.015										Guyana	HCFC-22					1,80	0	1,8	0	**100,00**	**1,80**
											UNDP																													
Haiti	35,00	2020	HCFC-22	3,60	1,26	2,34	**35,00**	**1,26**	3,6	Haiti	UNEP		95.916		31.640	Haiti			0	0	0	88.140	Haiti	HCFC-22				0,47	3,60	0,47	1,73	1,87	**48,06**	**1,73**
Honduras	35,00	2020	141bPolyol	0,80	0,00	0,80	**0,00**			Honduras													Honduras	141bPolyol					0,80	0	0	0,8	-	
Honduras	35,00	2020	HCFC-141b	1,90	0,67	1,23	**35,26**			Honduras	UNEP		56.500		28.250								Honduras	HCFC-141b					1,90	0	0,67	1,23	**35,26**	
Honduras	35,00	2020	HCFC-22	18,01	6,30	11,71	**34,98**			Honduras	UNIDO		64.500		43.000	Honduras			0	0	0	243.828	Honduras	HCFC-22				3,25	18,01	3,25	9,55	8,46	**53,03**	
				20,71	6,97	13,74	**33,66**	**6,97**	20,71																0,00	0,00	0,00	3,25	20,71	3,25	10,22	10,49	**49,35**	**10,22**
Jamaica	35,00	2020	HCFC-22	12,68	4,50	8,18	**35,49**			Jamaica	UNDP				62.350								Jamaica	HCFC-22				0,18	12,68	0,18	4,68	8	**36,91**	
Jamaica	35,00	2020	HCFC-141b	3,63	3,63	0,00	**100,00**			Jamaica	UNEP				9.040	Jamaica			0	0	0	36.837	Jamaica	HCFC-141b					3,63	0	3,63	0	**100,00**	
				16,31	8,13	8,18	**49,85**	**8,13**	16,31																0	0	0	0,18	16,31		8,31	8	**50,95**	**8,31**
Kiribati	35,00	2020	HCFC-22	0,07	0,02	0,05	**28,57**	**0,02**	0,07	Kiribati	UNEP				12.317	Kiribati			0	0	0	162.438	Kiribati	HCFC-22				0,02	0,07	0,02	0,04	0,03	**57,14**	**0,04**
Kyrgyzstan	#####	2025	HCFC-22	3,20	0,32	2,88	**10,00**			Kyrgyzstan						Kyrgyzstan				187000		59000	Kyrgyzstan	HCFC-22		1,43		0,27	3,20	1,7	2,02	1,18	**63,13**	
Kyrgyzstan	#####	2025	HCFC-141b	0,70	0,70	0,00	**100,00**			Kyrgyzstan	UNDP		187.250		58.850	Kyrgyzstan				176000		7000	Kyrgyzstan	HCFC-141b					0,70	0	0,7	0	**100,00**	
Kyrgyzstan	#####	2025	HCFC-142b	0,20	0,00	0,20	**0,00**			Kyrgyzstan	UNEP		176.054		7.006								Kyrgyzstan	HCFC-142b					0,20	0	0	0,2	-	
				4,10	1,02	3,08	**24,88**	**1,02**	4,1																0,00	1,43	0,00	0,27	4,10	1,7	2,72	1,38	**66,34**	**2,72**
Lao, PDR	35,00	2020	141bPolyol	3,24	0,00	3,24	**0,00**			Lao, PDR	France				5.085								Lao, PDR	141bPolyol					3,24	0	0	3,24	-	
Lao, PDR	35,00	2020	HCFC-22	2,30	0,80	1,50	**34,78**			Lao, PDR	UNEP				26.555	Lao People's Democrati			0	0	0	146.900	Lao, PDR	HCFC-22				0,53	2,30	0,53	1,33	0,97	**57,83**	
				5,54	0,80	4,74	**14,44**	**0,80**	5,54																0	0	0	0,53	5,54		1,33	4,21	**24,01**	**1,33**
Lesotho	35,00	2020	HCFC-22	3,50	1,23	2,27	**35,14**	**1,23**	3,5	Lesotho	Germany	94.920			31.640	Lesotho			0	0	21.763	0	Lesotho	HCFC-22					3,50	0	1,23	2,27	**35,14**	**1,23**
Liberia	35,00	2020	HCFC-22	5,30	1,85	3,45	**34,91**	**1,85**	5,3	Liberia	Germany				35.595	Liberia			0	0	24.483	0	Liberia	HCFC-22					5,30	0	1,85	3,45	**34,91**	**1,85**
FYR	35,00	2020	141bPolyol	1,55	1,55	0,00	**100,00**			FYR													FYR	141bPolyol					1,55	0	1,55	0	**100,00**	
FYR	35,00	2020	HCFC-22	1,80	0,63	1,17	**35,00**			FYR	UNIDO	88.150	140.825	80.625	80.625								FYR	HCFC-22				0,5	1,80	0,5	1,13	0,67	**62,78**	
				3,35	2,18	1,17	**65,07**	**2,18**	3,35																0	0	0	0,5	3,35		2,68	0,67	**80,00**	**2,68**
Malawi	35,00	2020	HCFC-22	10,80	3,78	7,02	**35,00**	**3,78**	10,8	Malawi	UNEP		45.200		39.550	Malawi			0	0	0	135.850	Malawi	HCFC-22				2,05	10,80	2,05	5,83	4,97	**53,98**	**5,83**
Maldives	#####	2030	HCFC-141b	0,00	0,00	0,00	**0,00**			Maldives	UNDP												Maldives	HCFC-141b					0,00	0	0	0		
Maldives	#####	2030	HCFC-22	3,70	3,70	0,00	**100,00**			Maldives	UNEP	56.500											Maldives	HCFC-22					3,70	0	3,7	0	**100,00**	
				3,70	3,70	0,00	**100,00**	**3,70**	3,7																0	0	0	0	3,70		3,7	0	**100,00**	**3,70**

											UNDP				30.100																					
Mali	35,00	2020	HCFC-22	14,97	5,20	9,77	**34,74**	**5,20**	14,97	Mali	UNEP		58.760		31.640	Mali			0	0	0	232.546	Mali	HCFC-22				1,95	14,97	1,95	7,15	7,82	**47,76**	**7,15**
Islands	35,00	2020	HCFC-22	0,22	0,08	0,14	**36,36**	**0,08**	0,22	Islands	UNEP				12.769	Marshall Islands			0	0	0	160.178	Islands	HCFC-22				0,07	0,22	0,07	0,15	0,07	**68,18**	**0,15**
Mauritius	#####	2030	HCFC-141b	0,13	0,13	0,00	**100,00**			Mauritius													Mauritius	HCFC-141b					0,13	0	0,13	0	**100,00**	
Mauritius	#####	2030	HCFC-22	7,87	7,87	0,00	**100,00**			Mauritius	Germany	372.890			180.758								Mauritius	HCFC-22					7,87	0	7,87	0	**100,00**	
				8,00	8,00	0,00	**100,00**	**8,00**	8																0	0	0	0	8,00		8	0	**100,00**	**8,00**
Micronesia	35,00	2020	HCFC-22	0,14	0,05	0,09	**35,71**	**0,05**	0,14	Micronesia	UNEP				12.656	Micronesia (Federated S			0	0	0	160.743	Micronesia	HCFC-22				0,05	0,14	0,05	0,1	0,04	**71,43**	**0,10**
Moldova, Rep	35,00	2020	HCFC-22	1,00	0,35	0,65	**35,00**	**0,35**	1	Moldova, Rep	UNDP				19.020								Moldova, Rep	HCFC-22					1,00	0	0,35	0,65	**35,00**	**0,35**
											UNEP		29.493																						
Mongolia	35,00	2020	HCFC-22	1,40	1,00	0,40	**71,43**	**1,00**	1,4	Mongolia	Japan					Mongolia			0	0	0	81.308	Mongolia	HCFC-22				0,12	1,40	0,12	1,12	0,28	**80,00**	**1,12**
											UNEP				41.810																				
Montenegro	35,00	2020	HCFC-22	0,80	0,28	0,52	**35,00**	**0,28**	0,8	Montenegro	UNIDO			32.250	22.575	Montenegro			0	0	0	101.043	Montenegro	HCFC-22				0,2	0,80	0,2	0,48	0,32	**60,00**	**0,48**
Mozambique	35,00	2020	HCFC-22	6,50	2,27	4,23	**34,92**	**2,27**	6,5	Mozambique	UNEP	33.900	33.900		33.900	Mozambique			0	0	0	129.058	Mozambique	HCFC-22				1,5	6,50	1,5	3,77	2,73	**58,00**	**3,77**
											UNIDO	81.750																						
Myanmar	35,00	2020	HCFC-141b	0,04	0,00	0,04	**0,00**			Myanmar													Myanmar	HCFC-141b					0,04	0	0	0,04	-	
Myanmar	35,00	2020	141bPolyol	1,83	0,00	1,83	**0,00**			Myanmar	UNEP	21.470	14.690		32.770								Myanmar	141bPolyol					1,83	0	0	1,83	-	
Myanmar	35,00	2020	HCFC-22	4,26	1,50	2,76	**35,21**			Myanmar	UNIDO	65.400				Myanmar			0	0	0	138.395	Myanmar	HCFC-22				1,58	4,26	1,58	3,08	1,18	**72,30**	
				6,13	1,50	4,63	**24,47**	**1,50**	6,13																0,00	0,00	0,00	1,58	6,13	1,58	3,08	3,05	**50,24**	**3,08**
Namibia	#####	2030	HCFC-141b	0,30	0,26	0,04	**86,67**			Namibia													Namibia	HCFC-141b					0,30	0	0,26	0,04	**86,67**	
Namibia	#####	2030	HCFC-22	8,10	8,10	0,00	**100,00**			Namibia	Germany	302.700											Namibia	HCFC-22					8,10	0	8,1	0	**100,00**	
				8,40	8,36	0,04	**99,52**	**8,36**	8,4																0	0	0	0	8,40		8,36	0,04	**99,52**	**8,36**
Nauru	35,00	2020	HCFC-22	0,01	0,00	0,01	**0,00**	**0,00**	0,01	Nauru	UNEP				8.362	Nauru			0	0	0	182.213	Nauru	HCFC-22					0,01	0	0	0,01	-	**0,00**
											UNDP				9.156																				
Nepal	35,00	2020	HCFC-22	1,27	0,64	0,63	**50,39**	**0,64**	1,27	Nepal	UNEP				14.238	Nepal			0	0	0	117.776	Nepal	HCFC-22				1,14	1,27	1,14	1,78	-0,51	**140,16**	**1,78**
Nicaragua	35,00	2020	HCFC-123	0,01	0,00	0,01	**0,00**			Nicaragua													Nicaragua	HCFC-123					0,01	0	0	0,01	-	
Nicaragua	35,00	2020	HCFC-124	0,03	0,00	0,03	**0,00**			Nicaragua													Nicaragua	HCFC-124					0,03	0	0	0,03	-	
Nicaragua	35,00	2020	HCFC-141b	0,60	0,60	0,00	**100,00**			Nicaragua													Nicaragua	HCFC-141b					0,60	0	0,6	0	**100,00**	
Nicaragua	35,00	2020	141bPolyol	0,31	0,31	0,00	**100,00**			Nicaragua	UNEP		33.900		11.300								Nicaragua	141bPolyol					0,31	0	0,31	0	**100,00**	
Nicaragua	35,00	2020	HCFC-22	6,10	1,78	4,32	**29,18**			Nicaragua	UNIDO		54.500		27.795	Nicaragua			0	0	0	123.114	Nicaragua	HCFC-22				1,18	6,10	1,18	2,96	3,14	**48,52**	
				7,05	2,69	4,36	**38,16**	**2,69**	7,05																0,00	0,00	0,00	1,18	7,05	1,18	3,87	3,18	**54,89**	**3,87**

											UNEP	141.250			56.500																				
Niger	35,00	2020	HCFC-22	16,00	5,60	10,40	**35,00**	**5,60**	16	Niger	UNIDO	96.750			21.500	Niger		0	0	0	216.736	Niger	HCFC-22				2,98	16,00	2,98	8,58	7,42	**53,63**	**8,58**
Niue	35,00	2020	HCFC-22	0,01	0,00	0,01	**0,00**	**0,00**	0,01	Niue	UNEP				8.249	Niue		0	0	0	182.778	Niue	HCFC-22					0,01	0	0	0,01	-	**0,00**
Palau	35,00	2020	HCFC-22	0,16	0,06	0,10	**37,50**	**0,06**	0,16	Palau	UNEP				13.560	Palau		0	0	0	156.223	Palau	HCFC-22				0,05	0,16	0,05	0,11	0,05	**68,75**	**0,11**
Guinea	#####	2030	HCFC-142b	0,02	0,02	0,00	**100,00**			Guinea												Guinea	HCFC-142b					0,02	0	0,02	0	**100,00**	
Guinea	#####	2030	HCFC-22	3,21	3,21	0,00	**100,00**			Guinea	Germany				149.812							Guinea	HCFC-22					3,21	0	3,21	0	**100,00**	
				3,23	3,23	0,00	**100,00**	**3,23**	3,23															0	0	0	0	3,23		3,23	0	**100,00**	**3,23**
Paraguay	35,00	2020	HCFC-123	0,20	0,00	0,20	**0,00**			Paraguay												Paraguay	HCFC-123					0,20	0	0	0,2	-	
Paraguay	35,00	2020	141bPolyol	1,36	0,00	1,36	**0,00**			Paraguay												Paraguay	141bPolyol					1,36	0	0	1,36	-	
Paraguay	35,00	2020	HCFC-124	0,15	0,00	0,15	**0,00**			Paraguay												Paraguay	HCFC-124					0,15	0	0	0,15	-	
Paraguay	35,00	2020	HCFC-142b	1,60	0,26	1,34	**16,25**			Paraguay												Paraguay	HCFC-142b					1,60	0	0,26	1,08	**16,25**	
Paraguay	35,00	2020	HCFC-22	15,95	5,32	10,63	**33,35**			Paraguay	UNDP											Paraguay	HCFC-22				2,34	15,95	2,34	7,66	2,97	**48,03**	
Paraguay	35,00	2020	HCFC-141b	0,05	0,00	0,05	**0,00**			Paraguay	UNEP				71.190	Paraguay		36.008	0	0	261.608	Paraguay	HCFC-141b	1,41				0,05	1,41	1,41	-1,36	-	
				19,31	5,58	13,73	**28,90**	**5,58**	19,31															1,41	0	0	2,34	19,31	3,75	9,33	4,40	**77,21**	**9,33**
										ASP	UNEP				50.850																			
Rwanda	35,00	2020	HCFC-123	0,06	0,06	0,00	**100,00**			Rwanda												Rwanda	HCFC-123					0,06	0	0,06	0	**100,00**	
Rwanda	35,00	2020	HCFC-141b	0,16	0,16	0,00	**100,00**			Rwanda												Rwanda	HCFC-141b					0,16	0	0,16	0	**100,00**	
Rwanda	35,00	2020	HCFC-142b	0,13	0,13	0,00	**100,00**			Rwanda	UNEP		33.900		31.640							Rwanda	HCFC-142b					0,13	0	0,13	0	**100,00**	
Rwanda	35,00	2020	HCFC-22	3,75	1,09	2,66	**29,07**			Rwanda	UNIDO					Rwanda		0	0	0	108.680	Rwanda	HCFC-22				0,75	3,75	0,75	1,84	1,91	**49,07**	
				4,10	1,44	2,66	**35,12**	**1,44**	4,1															0	0	0	0,75	4,10	0,75	2,19	1,91	**53,41**	**2,19**
Nevis	35,00	2020	HCFC-22	0,49	0,18	0,31	**36,73**	**0,18**	0,49	and Nevis	UNDP					Saint Kitts and Nevis		0	0	0	78.648	Nevis	HCFC-22				0,07	0,49	0,07	0,25	0,24	**51,02**	**0,25**
											UNEP				19.097																			
Saint Lucia	35,00	2020	HCFC-22	0,20	0,07	0,13	**35,00**	**0,07**	0,2	Saint Lucia	UNEP		10.396		23.730	Saint Lucia		0	0	0	123.833	Saint Lucia	HCFC-22				0,11	0,20	0,11	0,18	0,02	**90,00**	**0,18**
											UNIDO																							
and the	#####	2025	HCFC-22	0,28	0,28	0,00	**100,00**	**0,28**	0,28	and the	UNEP		116.390									and the	HCFC-22					0,28	0	0,28	0	**100,00**	**0,28**
											UNIDO																							
Samoa	35,00	2020	HCFC-22	0,25	0,09	0,16	**36,00**	**0,09**	0,25	Samoa	UNEP				16.781	Samoa		0	0	0	140.120	Samoa	HCFC-22				0,08	0,25	0,08	0,17	0,08	**68,00**	**0,17**
Principe	35,00	2020	HCFC-22	0,15	0,05	0,10	**33,33**	**0,05**	0,15	and Principe	UNEP		33.900		18.080	Sao Tome and Principe		0	0	0	154.209	Principe	HCFC-22				0,32	0,15	0,32	0,37	-0,22	**246,67**	**0,37**
Serbia	35,00	2020	HCFC-123	0,02	0,00	0,02	**0,00**			Serbia												Serbia	HCFC-123					0,02	0	0	0,02	-	
Serbia	35,00	2020	HCFC-142b	0,59	0,00	0,59	**0,00**			Serbia	UNEP	16.329			8.531							Serbia	HCFC-142b					0,59	0	0	0,59	-	
Serbia	35,00	2020	HCFC-22	7,76	2,94	4,82	**37,89**			Serbia	UNIDO	72.885			27.628	Serbia		0	0	0	137.020	Serbia	HCFC-22				1,65	7,76	1,65	4,59	3,17	**59,15**	
				8,37	2,94	5,43	**35,13**	**2,94**	8,37															0,00	0,00	0,00	1,65	8,37	1,65	4,59	3,78	**54,84**	**4,59**

Seychelles	#####	2030	HCFC-141b	0,02	0,02	0,00	**100,00**			Seychelles												Seychelles	HCFC-141b					0,02	0	0,02	0	**100,00**	
Seychelles	#####	2030	HCFC-22	1,40	1,40	0,00	**100,00**			Seychelles	Germany											Seychelles	HCFC-22					1,40	0	1,4	0	**100,00**	
				1,42	1,42	0,00	**100,00**	**1,42**	1,42															0	0	0	0	1,42		1,42	0	**100,00**	**1,42**
Sierra Leone	35,00	2020	HCFC-22	1,67	0,58	1,09	**34,73**	**0,58**	1,67	Sierra Leone	UNEP		23.730		23.730	Sierra Leone		0	0	0	123.833	Sierra Leone	HCFC-22				0,3	1,67	0,3	0,88	0,79	**52,69**	**0,88**
											UNIDO																						
Islands	35,00	2020	HCFC-22	1,93	0,67	1,26	**34,72**	**0,67**	1,93	Islands	UNEP				22.035	Solomon Islands		0	0	0	175.856	Islands	HCFC-22				0,63	1,93	0,63	1,3	0,63	**67,36**	**1,30**
South Sudan	35	2020	HCFC-22	1,64	0,57	1,07	**34,76**	**0,57**	1,64	South Sudan	UNEP		79.665		33.335	South Sudan		0	0	0	51.000	South Sudan	HCFC-22				0,27	1,64	0,27	0,84	0,8	**51,22**	**0,84**
											UNDP		54.500		43.600																		
Sri Lanka	35,00	2020	HCFC-141b	2,22	1,90	0,32	**85,59**			Sri Lanka	UNDP				33.433							Sri Lanka	HCFC-141b					2,22	0	1,9	0,32	**85,59**	
Sri Lanka	35,00	2020	HCFC-22	11,87	2,86	9,01	**24,09**			Sri Lanka	UNEP				28.137	Sri Lanka		0	0	0	225.929	Sri Lanka	HCFC-22				1,8	11,87	1,8	4,66	7,21	**39,26**	
				14,09	4,76	9,33	**33,78**	**4,76**	14,09															0	0	0	1,8	14,09		6,56	7,53	**46,56**	**6,56**
Suriname	35,00	2020	HCFC-142b	0,04	0,04	0,00	**100,00**			Suriname	UNEP	39.550			15.255							Suriname	HCFC-142b					0,04	0	0,04	0	**100,00**	
Suriname	35,00	2020	HCFC-22	1,94	0,65	1,29	**33,51**			Suriname	UNIDO	31.610			9.810	Suriname		0	0	0	123.833	Suriname	HCFC-22				0,4	1,94	0,4	1,05	0,89	**54,12**	
				1,98	0,69	1,29	**34,85**	**0,69**	1,98															0	0	0	0,4	1,98		1,09	0,89	**55,05**	**1,09**
Swaziland	35,00	2020	141bPolyol	5,60	5,60	0,00	**100,00**			Swaziland	UNDP											Swaziland	141bPolyol					5,60	0	5,6	0	**100,00**	
Swaziland	35,00	2020	HCFC-22	1,70	0,59	1,11	**34,71**		1,7	Swaziland	UNEP			33.900		Swaziland		0	0	0	171.198	Swaziland	HCFC-22				0,95	1,70	0,95	1,54	0,16	**90,59**	
				7,30	6,19	1,11	**84,79**	**6,19**																0	0	0	0,95	7,30		7,14	0,16	**97,81**	**7,14**
Tanzania	35,00	2020	HCFC-22	1,69	0,59	1,10	**34,91**	**0,59**	1,69	Tanzania	UNEP				24.860	United Republic of Tanz		0	0	0	123.833	Tanzania	HCFC-22				0,3	1,69	0,3	0,89	0,8	**52,66**	**0,89**
											UNIDO																						
Timor Leste	10,00	2015	HCFC-22	0,50	0,05	0,45	**10,00**	**0,05**	0,5	Timor Leste	UNDP	11.641				Timor-Leste		121.305	0	0	89.091	Timor Leste	HCFC-22	0,05			0,05	0,50	0,1	0,15	0,35	**30,00**	**0,15**
											UNEP	18.532																					
Tonga	35,00	2020	HCFC-22	0,14	0,05	0,09	**35,71**	**0,05**	0,14	Tonga	UNEP				14.351	Tonga		0	0	0	152.268	Tonga	HCFC-22				0,05	0,14	0,05	0,1	0,04	**71,43**	**0,10**
Turkmenistan	35,00	2020	HCFC-22	6,80	2,38	4,42	**35,00**	**2,38**	6,8	n	UNIDO				35.744	Turkmenistan		0	0	0	132.000	Turkmenistan	HCFC-22				1,5	6,80	1,5	3,88	2,92	**57,06**	**3,88**
Tuvalu	35,00	2020	HCFC-22	0,09	0,03	0,06	**33,33**	**0,03**	0,09	Tuvalu	UNEP				10.396	Tuvalu		0	0	0	172.043	Tuvalu	HCFC-22				0,03	0,09	0,03	0,06	0,03	**66,67**	**0,06**
Uganda	35,00	2020	HCFC-22	0,20	0,07	0,13	**35,00**	**0,07**	0,2	Uganda	UNEP				23.165	Uganda		0	0	0	94.400	Uganda	HCFC-22				0,02	0,20	0,02	0,09	0,11	**45,00**	**0,09**
											UNIDO																						
Vanuatu	35,00	2020	HCFC-142b	0,01	0,00	0,01	**0,00**			Vanuatu												Vanuatu	HCFC-142b					0,01	0	0	0,01	**-**	
Vanuatu	35,00	2020	HCFC-22	0,27	0,10	0,17	**37,04**			Vanuatu	UNEP				16.781	Vanuatu		0	0	0	140.120	Vanuatu	HCFC-22				0,09	0,27	0,09	0,19	0,08	**70,37**	
				0,28	0,10	0,18	**35,71**	**0,10**	0,28															0	0	0	0,09	0,28		0,19	0,09	**67,86**	**0,19**

Zambia	35,00	2020	HCFC-22	4,95	1,70	3,25	**34,34**	**1,70**	4,95	Zambia	UNEP		33.900		33.900
Zimbabwe	35,00	2020	HCFC-22	16,90	5,29	11,61	**31,30**			Zimbabwe					
Zimbabwe	35,00	2020	HCFC-141b	0,94	0,94	0,00	**100,00**			Zimbabwe					
Zimbabwe	35,00	2020	141bPolyol	6,11	6,11	0,00	**100,00**			Zimbabwe	Germany	188.097			62.699
Zimbabwe				23,95	12,34	11,61	**51,52**	**12,34**	23,95			0	0	0	-50850
								246,44	562,48			Approved in principle			
Subtotal LVC										LVC		2.727.688	2.673.150	537.725	2.921.356
Total LVC						**appr.**	**0,438**			LVC					
												2017	2018	2019	2020
Subtotal ALL										ALL		86.731.142	129.760.833	70.023.782	95.755.786
Total ALL					**tot**	**appr**	**0,591**			ALL					
2020															**402.662.268**
												Subtotal	**1903507**	**TOTAL**	**404.565.775**
										Kenya	667080				
										Mauritania	370934				
										Lao's DR	240805				
										Timor Leste	52599				
										Extra funding	572089				
								HPMP Verification			**1765800**			**TOTAL-T**	**406.331.575**

Zambia		0	0	0	122.265
Zimbabwe		0	0	0	0
-50850		Planned			
LVC		833.815	378.260	499.035	9.104.371
LVC		3.561.503	3.051.410	1.036.760	12.025.727
		2017	2018	2019	2020
ALL		14.340.655	34.644.105	24.582.374	47.853.876
ALL		101.127.639	164.082.793	94.606.156	143.973.319
	LVC		16.155.409		
	non-LVC		386.506.859		
	SUM		**402.662.268**		

Zambia	HCFC-22				0,95	4,95	0,95	2,65	2,3	**53,54**	**2,65**
Zimbabwe	HCFC-22					16,90	0	5,29	11,61	**31,30**	
Zimbabwe	HCFC-141b					0,94	0	0,94	0	**100,00**	
Zimbabwe	141bPolyol					6,11	0	6,11	0	**100,00**	
Zimbabwe		0,00	0,00	0,00	0,00	23,95	0	12,34	11,61	**51,52**	**12,34**
											307,99
									%appr.	**0,548**	
107.080.355											
								tot	**appr %**	**0,610**	

Annex 3 Decision XXVIII/2: Decision related to the amendment phasing down hydrofluorocarbons

Recalling decision XXVIII/1, by which the Meeting of the Parties adopted the amendment to the Montreal Protocol set out in annex I to the report of the Twenty-Eighth Meeting of the Parties (hereinafter referred to as the Amendment),

1. That paragraphs 2 and 4 of Article 2J in Article I of the Amendment are applicable to Belarus, Kazakhstan, the Russian Federation, Tajikistan and Uzbekistan;

2. That subparagraphs (b), (d) and (f) of paragraph 8 qua of Article 5 in Article I of the Amendment are applicable to Bahrain, India, the Islamic Republic of Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates (hereinafter referred to as Article 5, group 2, parties);

Elements in paragraph 1 (a) of decision XXVI/9, including intellectual property rights issues in considering the feasibility and ways of managing hydrofluorocarbons

3. To recognize the importance of timely updating international standards for flammable low-global-warming potential (GWP) refrigerants, including IEC60335-2-40, and to support promoting actions that allow safe market introduction, as well as manufacturing, operation, maintenance and handling, of zero-GWP or low-GWP refrigerant alternatives to hydrochlorofluorocarbons and hydrofluorocarbons;

4. To request the Technology and Economic Assessment Panel to conduct periodic reviews of alternatives, using the criteria set out in paragraph 1 (a) of decision XXVI/9, in 2022 and every five years thereafter, and to provide technological and economic assessments of the latest available and emerging alternatives to hydrofluorocarbons;

5. To request the Technology and Economic Assessment Panel to conduct a technology review four or five years before 2028 to consider a compliance deferral of two years from the freeze date of 2028 for Article 5, group 2, parties to address growth above a certain threshold in relevant sectors;

Relationship with the HCFC phase-out

6. To acknowledge the linkage between the hydrofluorocarbon and hydrochlorofluorocarbon reduction schedules relevant to sectors and the preference to avoid transitions from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons and to provide flexibility if no other technically proven and economically viable alternatives are available;

7. To also acknowledge these linkages with respect to certain sectors, in particular industrial process refrigeration, and the preference to avoid transitions from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons and to be willing to provide flexibility, if no other alternatives are available, in cases where:

(a) hydrochlorofluorocarbon supply may be unavailable from existing allowable consumption, stocks as well as recovered/recycled material, and

(b) it would allow for a direct transition at a later date from hydrochlorofluorocarbons to low-GWP or zero-GWP alternatives;

8. To provide, prior to the commencement of the Article 5 hydrofluorocarbon freeze and in the light of the acknowledgement in paragraph 7 above, flexibility measures in relation to the hydrochlorofluorocarbon phase-out relevant to certain sectors, in particular the industrial process refrigeration subsector, in order to avoid double conversions;

Financial issues

Overarching principles and timelines

9. To recognize that the Amendment maintains the Multilateral Fund for the Implementation of the Montreal Protocol as the financial mechanism and that sufficient additional financial resources will be provided by parties not operating under paragraph 1 of Article 5 to offset costs arising out of hydrofluorocarbon obligations for parties operating under paragraph 1 of Article 5 under the Amendment;

10. To request the Executive Committee to develop, within two years of the adoption of the Amendment, guidelines for financing the phase-down of hydrofluorocarbon consumption and production, including cost-effectiveness thresholds, and to present those guidelines to the Meeting of the Parties for the parties' views and inputs before their finalization by the Executive Committee;

11. To request the Chair of the Executive Committee to report back to the Meeting of the Parties on the progress made in accordance with this decision, including on cases where Executive Committee deliberations have resulted in a change in a national strategy or a national technology choice submitted to the Executive Committee;

12. To request the Executive Committee to revise the rules of procedure of the Executive Committee with a view to building in more flexibility for parties operating under paragraph 1 of Article 5;

Flexibility in implementation that enables parties to select their own strategies and priorities in sectors and technologies

13. That parties operating under paragraph 1 of Article 5 will have flexibility to prioritize hydrofluorocarbons, define sectors, select technologies and alternatives and elaborate and implement their strategies to meet agreed hydrofluorocarbon obligations, based on their specific needs and national circumstances, following a country-driven approach;

14. To request the Executive Committee of the Multilateral Fund to incorporate the principle referred to in paragraph 13 above into relevant funding guidelines for the phase-down of hydrofluorocarbons and in its decision-making process;

Guidance to the Executive Committee of the Multilateral Fund with respect to the consumption, production and servicing sectors

15. To request the Executive Committee, in developing new guidelines on methodologies and cost calculations, to make the following categories of costs eligible and to include them in the cost calculation:

(a) For the consumption manufacturing sector:

(i) Incremental capital costs;

(ii) Incremental operating costs for a duration to be determined by the Executive Committee;

(iii) Technical assistance activities;

(iv) Research and development, when required to adapt and optimize low-GWP or zero-GWP alternatives to hydrofluorocarbons;

(v) Costs of patents and designs, and incremental costs of royalties, when necessary and cost-effective;

(vi) Costs of the safe introduction of flammable and toxic alternatives;

(b) For the production sector:

(i) Lost profit due to the shutdown/closure of production facilities as well as production reduction;

(ii) Compensation to displaced workers;

(iii) Dismantling of production facilities;

(iv) Technical assistance activities;

(v) Research and development related to the production of low-GWP or zero-GWP alternatives to hydrofluorocarbons with a view to lowering the costs of alternatives;

(vi) Costs of patents and designs or incremental costs of royalties;

(vii) Costs of converting facilities to produce low-GWP or zero-GWP alternatives to hydrofluorocarbons when technically feasible and cost-effective;

(viii) Costs of reducing emissions of HFC-23, a by-product from the production process of HCFC-22, by reducing its emission rate in the process, destroying it from the off-gas, or by collecting and converting it to other environmentally safe chemicals. Such costs should be funded by the Multilateral Fund to meet the obligations of Parties operating under paragraph 1 of Article 5 specified under the Amendment;

(c) For the servicing sector:

(i) Public-awareness activities;

(ii) Policy development and implementation;

(iii) Certification programmes and training of technicians on safe handling, good practice and safety in respect of alternatives, including training equipment;

(iv) Training of customs officers;

(v) Prevention of illegal trade of hydrofluorocarbons;

(vi) Servicing tools;

(vii) Refrigerant testing equipment for the refrigeration and air-conditioning sector;

(viii) Recycling and recovery of hydrofluorocarbons;

16. To request the Executive Committee to increase in relation to the servicing sector the funding available under Executive Committee Decision 74/50 above the amounts listed in that decision for parties with total hydrochlorofluorocarbon baseline consumption up to 360 metric tonnes when needed for the introduction of alternatives to hydrochlorofluorocarbons with low-GWP and zero-GWP alternatives to hydrofluorocarbons and maintaining energy efficiency also in the servicing/end-user sector;

Cut-off date for eligible capacity

17. That the cut-off date for eligible capacity is 1 January 2020 for those parties with baseline years from 2020 to 2022 and 1 January 2024 for those parties with baseline years from 2024 to 2026;

Second and third conversions

18. To request the Executive Committee to incorporate the following principles relating to second and third conversions into funding guidelines:

(a) First conversions, in the context of a phase-down of hydrofluorocarbons, are defined as conversions to low-GWP or zero-GWP alternatives of enterprises that have never received any direct or indirect support, in part or in full, from the Multilateral Fund, including enterprises that converted to hydrofluorocarbons with their own resources;

(b) Enterprises that have already converted to hydrofluorocarbons in phasing out chlorofluorocarbons and/or hydrochlorofluorocarbons will be eligible to receive funding from the Multilateral Fund to meet agreed incremental costs in the same manner as enterprises eligible for first conversions;

(c) Enterprises that convert from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons, after the date of adoption of the Amendment, under hydrochlorofluorocarbon phase-out management plans already approved by the Executive Committee will be eligible to receive funding from the Multilateral Fund for a subsequent conversion to low-GWP or zero-GWP alternatives to meet agreed incremental costs in the same manner as enterprises eligible for first conversions;

(d) Enterprises that convert from hydrochlorofluorocarbons to high-GWP hydrofluorocarbons with their own resources before 2025 under the Amendment will be eligible to receive funding from the Multilateral Fund to meet agreed incremental costs in the same manner as enterprises eligible for first conversions;

(e) Enterprises that convert from hydrofluorocarbons to lower-GWP hydrofluorocarbons with Multilateral Fund support when no other alternatives are available will be eligible to receive funding from the Multilateral Fund for a subsequent conversion to low-GWP or zero-GWP alternatives if necessary to meet the final hydrofluorocarbon phase-down step;

Sustained aggregate reductions

19. To request the Executive Committee to incorporate the following principle related to sustained aggregate reductions into Multilateral Fund policies: remaining eligible consumption for funding in tonnage will be determined on the basis of the starting point of national aggregate consumption less the amount funded by previously approved projects in future multi-year agreement templates for hydrofluorocarbon phase-down plans, consistent with Executive Committee decision 35/57;

Enabling activities

20. To request the Executive Committee to include the following enabling activities to be funded in relation to the hydrofluorocarbon phase-down under the Amendment:

(a) Capacity-building and training for the handling of hydrofluorocarbon alternatives in the servicing, manufacturing and production sectors;

(b) Institutional strengthening;

(c) Article 4B licensing;

(d) Reporting;

(e) Demonstration projects; and

(f) Development of national strategies;

Institutional strengthening

21. To direct the Executive Committee to increase institutional strengthening support in light of the new commitments related to hydrofluorocarbons under the Amendment;

Energy efficiency

22. To request the Executive Committee to develop cost guidance associated with maintaining and/or enhancing the energy efficiency of low-GWP or zero-GWP replacement technologies and equipment, when phasing down hydrofluorocarbons, while taking note of the role of other institutions addressing energy efficiency, when appropriate;

Capacity-building to address safety

23. To request the Executive Committee to prioritize technical assistance and capacity-building to address safety issues associated with low-GWP or zero-GWP alternatives;

Disposal

24. To request the Executive Committee to consider funding the cost-effective management of stockpiles of used or unwanted controlled substances, including destruction;

Other costs

25. That the parties may identify other cost items to be added to the indicative list of incremental costs emanating as a result of the conversion to low-GWP alternatives;

Exemption for high-ambient-temperature parties

26. To make available an exemption for parties with high ambient temperature conditions where suitable alternatives do not exist for the specific sub-sector of use, as described below;

27. To distinguish and separate this exemption from the essential-use and critical-use exemptions under the Montreal Protocol;

28. To make this exemption effective and available as of the hydrofluorocarbon freeze date, with an initial duration of four years;

29. To apply this exemption for sub-sectors, contained in Appendix I of this decision, in parties with an average of at least two months per year over ten consecutive years with a peak monthly average temperature above 35 degrees Celsius, where the party listed in Appendix II has formally notified the Secretariat of its intent to use this exemption no later than one year before the hydrofluorocarbon freeze date, and every four years thereafter should it wish to extend the exemption;[15,16]

30. That any party operating under this high-ambient-temperature exemption will report separately its production and consumption data for the sub-sectors to which the exemption applies;

31. That any transfer of production and consumption allowances for this high-ambient-temperature exemption will be reported to the Secretariat under Article 7 of the Protocol by each of the parties concerned;

32. That the Technology and Economic Assessment Panel and a subsidiary body of the Panel that includes outside experts on high ambient temperatures will assess the suitability of hydrofluorocarbon alternatives for use where suitable alternatives do not exist based on criteria agreed by the parties that will include, but not be limited to, the criteria listed in paragraph 1 (a) of decision XXVI/9, and recommend sub-sectors to be added to or removed from appendix I to the present decision and report this information to the Meeting of the Parties;

[15] Spatially weighted average temperatures deriving the daily highest temperatures (using the Centre for Environmental Data Archival:
http://browse.ceda.ac.uk/browse/badc/cru/data/cru_cy/cru_cy_3.22/data/tmx.

[16] As listed in Appendix II to the present decision.

33. That the assessment referred to in paragraph 32 above will take place periodically starting four years from the hydrofluorocarbon freeze date and every four years thereafter;

34. To review, no later than the year following receipt of the first report of the Technology and Economic Assessment Panel on the suitability of alternatives, the need for an extension of the high-ambient-temperature exemption for a further period of up to four years, and periodically thereafter, for specific sub-sectors in parties that meet the criteria set out in paragraph 29 above, and that parties will develop an expedited process for ensuring the renewal of the exemption in a timely manner where there are no feasible alternatives, taking into account the recommendation of the Panel and its subsidiary body;

35. That amounts of Annex F substances that are subject to the high-ambient-temperature exemption are not eligible for funding under the Multilateral Fund while they are exempted for that party;

36. That the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol and the Meeting of the Parties should, for 2025 and 2026, defer consideration of the hydrochlorofluorocarbon compliance status of any party operating under a high-ambient-temperature exemption in cases where it has exceeded its allowable consumption or production levels due to its HCFC-22 consumption or production for the sub-sectors listed in appendix I to the present decision, on the condition that the party concerned is following the phase-out schedule for consumption and production of hydrochlorofluorocarbons for other sectors and has formally requested a deferral through the Secretariat;

37. To consider, no later than 2026, whether to extend the compliance deferral referred to in paragraph 36 for an additional period of two years and, if appropriate, to consider further deferrals thereafter, for parties operating under the high-ambient-temperature exemption;

Other exemptions

38. To allow for other exemptions, such as for essential uses and critical uses, for production or consumption that is necessary to satisfy uses agreed by the parties to be exempted uses;

39. To consider mechanisms for such exemptions in 2029, including multi-year exemption mechanisms;

40. To provide information and guidance to the Technology and Economic Assessment Panel for its periodic review of sectors where exemptions may be required;

Appendix I: List of exempted equipment for high ambient temperatures

(a) Multi-split air conditioners (commercial and residential)

(b) Split ducted air conditioners (commercial and residential)

(c) Ducted commercial packaged (self-contained) air-conditioners

Appendix II: List of countries operating under the high-ambient-temperature exemption

Algeria, Bahrain, Benin, Burkina Faso, Central African Republic, Chad, Côte d'Ivoire, Djibouti, Egypt, Eritrea, Gambia, Ghana, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Libya, Mali, Mauritania, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Sudan, Syrian Arab Republic, Togo, Tunisia, Turkmenistan, United Arab Emirates.

Annex 4 Informal consultations on Decision XXVIII/5 on the 2018-2020 replenishment of the Multilateral Fund

A4.1 Overview

Based on the draft questionnaires, members of the TEAP Task Force on Replenishment conducted informal consultations with on Decision XXVIII/5 at the 77th Meeting of the Executive Committee of the Montreal Protocol Multilateral Fund, 28 November to 2 December 2016, Montreal, Canada. Attending were Replenishment Task Force (RTF) co-chairs Lambert Kuijpers, Bella Maranion, and Shiqiu Zhang, as well as members Paulo Altoe, Horace Nelson and Helen Walter. Also attending as observers were TEAP co-chairs Marta Pizano and Ashley Woodcock. In total, the RTF members were able to consult with 17 representatives from parties (Argentina, Australia, Austria, Brazil, Cameroon, Canada, China, Egypt, France, India, Japan, Mexico, Netherlands, Nigeria, Pakistan, Sweden, and United States) in addition to the four implementing agencies (UNEP, UNDP, UNIDO, and World Bank) and the Multilateral Fund Secretariat (MLFS). Key topics emerged during these discussions, and these are highlighted below along with the specific comments from consultees for the information of RTF members. This is only a draft consolidation of notes taken by members during discussions to inform further discussions by the RTF on its approach to the decision on replenishment. A summary of these consultations is planned to be included in an annex to the final report.

In previous replenishment reports, the MLFS has provided consolidated information on HPMPs and status of implementation projects in addition to other support as required to the TEAP RTF. In meetings on the Monday and Tuesday after ExCom-77, the MLFS confirmed its continued support and cooperation to the TEAP RTF. The report of ExCom-77 including the agreements reached on China and India HPMPs stage II should be available shortly and will be important considerations for the RTF.

Decision XXVIII/5: Terms of reference for the study on the 2018–2020 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol

Recalling the parties' decisions on previous terms of reference for studies on the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol,

Recalling also the parties' decisions on previous replenishments of the Multilateral Fund,

1. To request the Technology and Economic Assessment Panel to prepare a report for submission to the Twenty-Ninth Meeting of the Parties, and to submit it through the Open-ended Working Group at its thirty-ninth meeting, to enable the Twenty-Ninth Meeting of the Parties to adopt a decision on the appropriate level of the 2018–2020 replenishment of the Multilateral Fund;

2. That, in preparing the report referred to in paragraph 1 of the present decision, the Panel should take into account, among other things:

(a) All control measures and relevant decisions agreed upon by the parties to the Montreal Protocol and the Executive Committee of the Multilateral Fund, in particular those pertaining to the special needs of low-volume- and very-low-volume-consuming countries, in addition to small and medium-sized enterprises, and the decisions of the Twenty-Eighth Meeting of the Parties and the Executive Committee at its meetings, up to and including its seventy-eighth meeting, insofar as those decisions will necessitate expenditure by the Multilateral Fund during the period 2018–2020;

(b) The need to allocate resources to enable all parties operating under paragraph 1 of Article 5 of the Montreal Protocol (Article 5 parties) to achieve and/or maintain compliance with Articles 2A–2E, 2G, 2H, 2I and 2J of the Protocol;

(c) The need to allocate resources to enable all Article 5 parties to meet compliance obligations relevant in the replenishment period 2018–2020 in respect of Article 2F of the Protocol, providing support for a transition to low-global- warming-potential (GWP) or zero-GWP alternatives in hydrochlorofluorocarbon (HCFC) phase-out, taking into account decision XIX/6 of the Meeting of the Parties and the extended commitments made by Article 5 parties under approved HCFC phase-out management plans;

(d) Rules and guidelines agreed upon by the Executive Committee at all its meetings, up to and including its seventy-eighth meeting, for determining eligibility for the funding of investment projects and non-investment projects, including, but not limited to, institutional strengthening;

3. That the Technology and Economic Assessment Panel should provide indicative figures of the resources within the estimated funding required for phasing out HCFCs that could be associated with enabling Article 5 parties to encourage the use of low-GWP or zero-GWP alternatives and indicative figures for any additional resources that would be needed to further encourage the use of low-GWP or zero-GWP alternatives;

4. The need for additional resources to enable Article 5 parties to carry out initial activities related to the phase-down of HFCs listed under Annex F and controlled under Article 2J;

5. That in preparing the report the Panel should consult widely, including all relevant persons and institutions and other relevant sources of information deemed useful;

6. That the Panel should strive to complete the report in good time to enable it to be distributed to all parties two months before the thirty-ninth meeting of the Open-ended Working Group;

7. That the Panel should provide indicative figures for the periods 2021–2023 and 2024-2026 to support a stable and sufficient level of funding, on the understanding that those figures d in subsequent replenishment studies;

A4.2 Summary of Informal Consultations

Q. What would you expect to be the (average) reduction target of committed HPMPs stage II by January 2020 and how would these be followed up by HPMPs stage III as of 2020, or maybe before?

One consultee mentioned that, in order to create opportunities for funding "HFC Management Plans" (HMPs) for Kigali related projects after 2020-2021, it would be desirable to continue the HPMP approach in an accelerated manner in the next triennium, after which it then could slow down after 2021-2022. This would be acceptable because the main issue after 2020 would be the addressing of the servicing component, which would cover more or less the same issues as the ones in the HMPs (i.e., the servicing of HFC and low GWP alternatives equipment). Certain non-LVC consultees mentioned that a lot could be done and that HCFCs could virtually be phased out via a stage II/III approach during the period 2022-2024. One thing all consultees agreed to, and that is that high GWP HFCs as alternatives should be avoided as much as possible. Consultees mentioned that, as far as technologies is concerned, one should leapfrog to more efficient, possibly to not-in-kind technologies (HFC-32 could be leapfrogged, since it is a more or less "archaic" alternative, one consultee said and he said that e.g., carbon dioxide is not). On the other hand, consultees mentioned that the Fund cannot do everything and has to follow global trends. It can steer to some degree, so that enterprises might not take certain "unwanted" directions for the future. Some consultees said that it needs mentioning that, even with the Fund not doing transitions from HCFC-22 to R-410A, a significant part of the market is using R-410A, and this part is still rapidly expanding (not from a HCFC conversion, but independently, just by growth of the production of HFC based products).

It was generally mentioned that guidelines for stage III HPMPs should not be different from those for stage II HPMPs.

In many HPMPs the SMEs should get a lot of attention, percentages of 20-50% for SMEs in countries were mentioned, where cost effectiveness should not be limited to the usual thresholds. SMEs would be particularly important in the next period and thereafter, also because so many SMEs were involved in the refrigeration servicing sector. Several developing countries said that there is an enormous use of HCFC-22 in the servicing sector, compared to the use in manufacturing. Certain countries did not see a reason to treat SMEs differently, since they should be included in the whole cost effectiveness package (see further below).

Calculation of the amount of funding needed would be relatively easy with the China and India HPMP plans adopted, since it would give insights in alternatives to be applied, sectors addressed and the tranches for funding. With these countries representing 60-70% of the total HCFC consumption, the determination of the funding required in the next triennium would be relatively straightforward.

Where it concerns the paragraphs 2c and 3 in the TOR, many consultees thought they were repetitive and not really different. Others were of the opinion that they were very specific and addressed different aspects of the HCFC phase-out. In that case, paragraph 2c would address the specific HCFC phase-out and the switch to alternatives, paragraph 3 would elaborate on different alternatives and the going the more energy efficient, lower GWP and flammable alternatives for which also the extra 25% in costs could be considered. One consultee mentioned that one could separate two things here, being one step in going from HCFCs to high GWP alternatives, where the second step would then be the transition to low or zero GWP alternatives (each with specific costs). As an extra example, the consultee mentioned the first step of transitioning from HCFC-22 to HFC-32, where the next step would be to continue to transition to lower or zero GWP alternatives. In many cases (and particularly for SMEs) the use of the as costly perceived HFOs was questioned. Some consultees, however, mentioned that the price would definitely go down, the further one goes down the road. The HFC-134a experience (where prices decreased significantly over the years after its introduction) was mentioned as an example that would also hold for HFOs.

Some consultees noted the fact that, in many cases, HPMPs stage I had performed to what was expected, often even better. This was also shown by the fact that total HCFC consumption in Article 5 in 2015 was 23-25% below the baseline, being much better than the 10% below baseline for 2015 as mandated in the Protocol (this even taking into consideration that often stockpiling occurs in a year before a next control step). This would imply a relatively low amount of money or funds to reach the 35% reduction by 2020, as was mentioned by one consultee.

This consultee also said that one would need to critically study the tranche mechanism. A country might reach its target already before that all funds (final tranche) have been released, in other cases progress may be slower than expected. This could imply that certain funding could be moved to the future and in this way the amount needed in a triennium (for which it was originally planned) could be reduced. It was also mentioned said that the amounts given in the business planning were often too high.

One consultee said that it is important to also look at the LVCs that have a 35% reduction agreed for 1 January 2020 (which was already agreed before 2014); he raised the question what would have to happen in this case. For LVCs and non-LVCs the project preparation funding mechanism would have to be analyzed, i.e., when is it that this funding will be needed, in 2019 or 2020.

Whereas several consultees were of the opinion that the HPMP activity should be combined with a start of HMP activity as of 2020-2021, others considered the HCFC phase-out activity via HPMPs as the main priority until 2023-2024.

Q. What are your concerns related to the Kigali Amendment, early conversions, costs and availability of alternatives, SMEs and the servicing sector in relation to the replenishment?

Early transitions to low GWP alternatives

Consultees noted some possible options as well as concerns for fast transitions. Some consultees noted that additional funding may be needed for fast transitions to low GWP alternatives; some even noting that funding for these transitions should be made available as soon as possible, where "as soon as possible" was meant to be after that the Kigali Amendment had entered into force, e.g. starting in the 2018-2020 triennium. While others mentioned that their focus is on compliance with ODP requirements at shorter notice (2018-2022) rather than taking any action to transition to low GWP alternatives.

Concerns were noted that US$27 million was insufficient for a significant number of early conversions and it was also noted that transitions directed enterprise by enterprise. This rather than developing regulations to address the entire market segment which may delay significant conversion opportunities that could move faster with different policies and the removal of barriers.

Consultees mentioned that countries are implementing at different rates and participation in early conversions is uncertain. Countries that may try to transition early may only need to focus on the service sector and the import of products containing high GWP fluids.

One consultee also made the comment that, particularly for the refrigeration sector, it would be helpful to see transitions take place in non-Article 5 countries first, before that they could be initiated and completed in Article 5 countries.

Possible options noted by consultees for a fast transition to low GWP alternatives:

- Domestic appliance refrigeration transition to isobutane

- Mobile air conditioning transitions will mostly be required for multi-national companies (MNCs). Previous transitions had seen very few needed projects for the local companies where it concerns compressors and other equipment.
- Bottle coolers, ice cream makers conversions as well as foam transitions may not be difficult
- Foam and aerosols is expected to come first and MAC and air conditioning will be later.
- Automotive AC transitions in non-Article 5 countries -due to local regulations- could drive transition in Article 5 countries to be earlier as well.

Cost, availability, and selection of alternatives

Some of the consultees mentioned concerns about the cost and availability of low GWP alternatives solutions for both stage II HPMPs and for future HFC transitions.

One concern noted concerned safety equipment related to the use of flammable foam blowing agents like pentanes, in particular for SMEs. It was mentioned here that the funding does not cover the cost of transition, and it is possible that a higher cost effectiveness factor may be needed to address the transitions to be done in SMEs.

It could also be observed that some consultees indicated at much higher costs for alternatives than others.

One consultee noted the concern about the availability of low GWP alternatives in Article 5 countries and that their selection is more complicated because there are more options available. It may be difficult to know which alternative to select for the various (sub-) sectors. In addition, the developed world was already using the alternatives in the past, and it seems that this may not yet the case, which would make it difficult to convince companies to transition to these new alternatives. Another consultee stated that one thinks that the low GWP technology is already available, but it also needs to be commercially available and at an affordable price

Q. Small and Medium Enterprises; are there any specific concerns related to SMEs that need to be taken into account in the replenishment study?

Some consultees noted that transitions could take place very quickly to low GWP alternatives in foams, while others stated that they believe that SME transitions will be very difficult because there are hundreds of SMEs, and particularly the HFOs have so far not been broadly used in some Article 5 countries. System houses will have to support transitions for smaller foam companies, where some of them may not have development laboratories or technical expertise to support the (necessary) blend optimisation. Some sectors have been testing HFCs to meet ODS transition requirements. In addition, conversion funding could be based on low volume consumption years due to economic volatility, where the conversion may be needed in a year when higher volumes will be consumed.

In addition, a concern was noted that HFO technology pricing and availability is of concern; one mentioned that suppliers have reported that HFOs will be available in 2018, but the concern about availability still remains. There is also a concern that the guidelines for projects related to the foam sector have been supported at a rate lower than needed for HFCs and that HFOs transition costs could be higher still. There are some enterprises considering transitioning to high GWP HFCs rather than HFOs because of these issues and that earlier intervention may be needed since it is likely that these transitions will have been completed by 2021. Other consultees focused solely on meeting the compliance goals in the next triennia.

Other consultees noted that the SME language in the Kigali HFC Amendment is similar to earlier used language regarding SMEs. Furthermore, that SMEs get a higher percentage of funds compared to their consumption and that this will continue to be taken into account.

Other comments related to SMEs included concerns that there may be equipment needs for foam transitions in high ambient temperature regions to cool pre-blended polyol drums which may not have been taken into account in HPMP funding calculations.

Q. Where it concerns the refrigeration servicing sector, is there a relationship between the refrigerant servicing sector and the funding required for the next triennia?

One consultee noted the importance of the refrigerant service sector because it is greater than 50% of the total HCFC consumption in many Article 5 countries (note by RTF: this is normally the case). Another consultee ventilated concern about the cost of conversion for refrigerant servicing including the price of alternatives for smaller size packages, necessary training and equipment for servicing the new alternatives, the overall supply chain, and limited funding resources for demonstration projects. The consultee noted that there may be further discussion on these points relative to cost effectiveness threshold discussions in future ExCom meetings.

Q. In the period 2018-2020, what are the initial activities envisioned by Article 5 parties related to the phase-down of HFCs and is there an expected level of the additional resources that would be required?

Most consultees were in agreement that in this period, initial activities could include preparatory activities for which funding has been provided in the past to support implementation of agreed control schedules for Article 5 parties. Consultees considered that activities in this triennium would be preliminary, non-investment type activities with a focus on parties establishing good baseline data, information systems, and considering needed framework for compliance. Typical activities mentioned were ongoing activities already supported such as the HFC surveys; other activities mentioned were funding for institutional strengthening, capacity building, technical assistance, demonstration projects if needed, preparation for projects, support for beginning national plans and considering policy and legal options, preparation for other compliance frameworks such as licensing systems. There is an expectation that there would be no difference in support available to Group I versus Group II parties (as "preliminarily defined in the Kigali Amendment").

A number of consultees noted that since the first freeze date on HFCs does not take place until 2024, there should be limited initiating activities requiring funding. There was also a view expressed that as much as possible the existing HCFC phase out obligations could be used to avoid HFCs by, for example, considering using low-GWP options, and using the existing national HCFC management plans and financial mechanisms available. The view was also expressed that it will be difficult to predict at this point how to include resources for HFC initiating activities in the coming years while maintaining stability of funding which is important. In this regard, a consultee noted that the role of the MLF is to provide some incentives to move enterprises to consider low-GWP options, to look at the global market trend and not necessarily divert but inform its choices, but the MLF cannot do everything.

One consultee expressed that view that there should be sufficient funding to encourage "early starters" and those looking to move to more aggressive reductions of HFCs. Other expressed the view that in this triennium, additional funding may be needed for HFC initiating activities, however the priority for funding

should remain on the approved HPMPs stage II. Until further guidelines on HFC projects are agreed, consultees generally agreed that HPMP guidelines and cost-effectiveness thresholds should be used.

Q. When do you expect that mitigation measures for HFC-23 following the Kigali Amendment could come in as a result of guidelines discussions, which costs do you expect to be incremental and eligible, and which would be the timeframe that HFC-23 emissions would need to be addressed?

HFC-23 mitigation will have to be addressed as of 2020, following the Kigali amendment. Most consultees were of the opinion that this should be via incineration facilities (plasma arc incineration was specifically mentioned). Investment costs for incineration for a typical HCFC-22 plant capacity were said to be in the order of US$ 1 million, with operating costs in the order of US$3-5 per kg of HFC-23; several consultees could not give any cost estimates. Next to incineration it was also mentioned that there exist several means to reduce the emission of HFC-23 from the process, which should all be applied where possible. One consultee mentioned that the various means of reducing HFC-23 emissions still would need to be prioritised. One consultee said that it would need some consideration how to address this issue in the upcoming replenishment period; it could be a combination of costs for destruction facilities, operating costs and leak reduction. One other consultee mentioned that its country would not prefer incineration, but only other means to decrease the HFC-23 emissions to virtually zero. One consultee mentioned that no further funding should be made available if thermal oxidation units would have been installed.

With the decrease in HCFC-22 need for emissive uses, the closure of HCFC-22 plants may be considered, according to many consultees, rather than the installation of HFC-23 incineration units. Some consultees were very outspoken in favor of the closure option, since it would also avoid the monitoring of HFC-23 streams. Closure would apply specifically to those countries that do not manufacture feedstock. This could then apply to plants in Argentina, Mexico, Venezuela and perhaps in India, although India also manufactures feedstock. In India there is or will be a regulation for incineration to avoid HFC-23 emissions to the atmosphere, which apparently applies to 4 of the 5 plants in the country at present.

The HCFC-22 plants (for HCFC-22 production for emissive uses) in the countries mentioned are all HCFC-22 swing plants. Where there had not been closure funding available for swing plants in the past, several consultees said that it would be likely with the issue of HFC-23 incineration being considered, the closure of swing plants would become eligible for (compensation) funding. One consultee mentioned an amount of US$ 50-60 million for plant closure. It should be noted that worldwide incineration of HFC-23 from HFC-22 production would also have operational costs in the order of US$ 10-30 million per year.

The largest capacity of HCFC-22, both for emissive uses and for feedstock is in China. Several consultees mentioned a number of plants, which varied from 14 to 17 (or maybe 19) for China. The amount of plants that was assumed to have incineration units or other means to mitigate HFC-23 also varied according to several consultees. One consultee mentioned that, according to verification reports, 13 of the 14 production units in China are equipped with destruction technology. Two consultees mentioned that all plants in China had been provided with incineration units.

Where certain HCFC-22 plants could be considered for closure, there was agreement that this would not apply for plants producing HCFC-22 for feedstock. Even when the total amount of HCFC-22 for feedstock (as reported following Article 7) has decreased slightly from 2014 to 2015, most consultees said that the feedstock trend would continue to be upwards for the next one or two decades. If eligible, this would imply significant amounts of funding for operational costs for units dealing with this part of the HCFC-22 production.

No concrete suggestions were made by consultees how (and in which timeframe) eligible costs for HFC-23 mitigation (e.g., investments in incineration plants and other means, operational costs (during how many years)) would have to be taken into account for 2020 and for later years. One consultee raised the question that it still needs to be established which costs are incremental. Several consultees said that this issue was addressed in the production working group but that no definite guidelines had yet been developed (this would then also apply to the closure funding for HCFC-22 swing plants). The issue may also be discussed and perhaps decided in the next ExCom (ExCom-78 and -79) meetings in April and July 2017 (Note: in the latter case, the RTF report has to make certain balanced assumptions).

Q. What would you expect regarding the funding needs in the two subsequent triennia 2021-2023 and 2024-2026?

Generally, consultees expect an increase in funding requirement because in these years, investment projects related to the Kigali Amendment would come in. In order to keep the funding profile somewhat stable, some consultees mentioned that HPMPs should be accelerated in the triennium 2018-2020, after which efforts could be somewhat reduced to give more room for Kigali related investments. Some consultees mentioned that also in the triennium 2021-2023 the HCFC phase-out would be first priority for them, and no investments for Kigali related projects would be important. One consultee also mentioned that the first reduction step for Group I under the Kigali Amendment would be in 2028, which would therefore imply that not much funding for HFC related investment projects ("apart from fast track countries") would be needed in the two subsequent triennia. Generally, consultees agreed that the Replenishment Report should consider funding consequences of existing and future HCFC HPMPs and future HFC HMPs separately. The consultees could not provide many concrete "first" ideas of activities and related issues regarding the level of funding that might be required in upcoming triennia.