

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
<i>Non-investment</i>	
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
<i>Subtotal non-investment activities</i>	<i>39.78-49.78</i>
<i>Supporting activities</i>	
UNEP CAP	34.80
Agency Core Unit costs	17.84
Secretariat and ExCom	20.16
Treasurer	1.50
<i>Subtotal supporting activities</i>	<i>74.30</i>
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;