

Study on the 2021-2023 Replenishment of the Multilateral Fund for Implementation of the Montreal Protocol

**Suely Carvalho, Bella Maranion, Shiqiu Zhang
Co-chairs, TEAP Decision XXXI/1 Replenishment
Task Force**



T E A P

**14-16 July
2020**

Decision XXXI/1: Terms of reference for the study on the 2021–2023 replenishment of the Multilateral Fund

1. To request the TEAP to prepare a report to enable the Parties to adopt a decision on the appropriate level of the 2021–2023 replenishment of the Multilateral Fund (MLF);
2. TEAP 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 (ExCom) of the MLF, including decision XXVIII/2 and the decisions of the 31st Meeting of the Parties and the ExCom at its meetings, up to and including its 85th meeting, insofar as those decisions will necessitate expenditure by the MLF during the period 2021–2023;
 - b. The need to consider the special needs of low-volume-consuming (LVC) and very-low-consuming countries;

Decision XXXI/1 (2)

- c) The need to allocate resources to enable all parties operating under paragraph 1 of Article 5 of the Montreal Protocol (Article 5 or A5 parties) to achieve and/or maintain compliance with Articles 2A–2J of the Protocol, taking into account decision XIX/6 of the Meeting of the Parties, and the reductions and extended commitments made by Article 5 parties under approved hydrochlorofluorocarbon (HCFC) phase-out management plans and decision XXVIII/2, and noting that the Panel in its supplementary report shall provide any information or clarification as requested by any party relating to the allocation of resources;
- d) Decisions, rules and guidelines agreed by the ExCom at all its meetings, up to and including its eighty-fifth meeting, in determining eligibility for the funding of investment and non-investment projects;

Decision XXXI/1 (3)

- e) The need to allocate resources for Article 5 parties to comply with the Kigali Amendment to the Montreal Protocol, including the preparation and, if needed, the implementation of phase-down plans for hydrofluorocarbons (HFCs) that could include early activities in the servicing/end users sector in order to comply with the Kigali Amendment by addressing the high growth rate in HFC consumption;
- f) The need to allocate resources to the low-volume-consuming countries for the introduction of zero-global-warming-potential or low-global-warming-potential alternatives to HFCs and to maintain energy efficiency in the servicing/end users sector, in line with any relevant decisions of the ExCom;
- g) Three scenarios representing different potential levels of ratification of the Kigali Amendment when estimating the funding requirement for the phase-down of HFCs;
- h) The cost of supporting a limited number of stand-alone projects transitioning out of HFCs, in accordance with paragraph 4 of decision XXX/5;

Decision XXXI/1 (4)

3. That the Panel should provide indicative figures of the resources within the estimated funding required for phasing out HCFCs that could be associated with enabling A5 parties to directly transition from HCFCs to the use of low-global-warming-potential (GWP) or zero-GWP alternatives, taking into account global warming potential, energy use, safety and other relevant factors. The indicative figures should be provided for a range of typical scenarios, including a LVC country, a small manufacturing country and a medium-sized manufacturing country;
4. That, in preparing the report, the Panel should consult widely, including all relevant persons and institutions and other relevant sources of information deemed useful;
5. 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 42nd meeting of the OEWG;
6. That the Panel should provide indicative figures for the periods 2024–2026 and 2027–2029 to support a stable and sufficient level of funding, on the understanding that those figures and in subsequent replenishment studies.

TEAP Replenishment Task Force (RTF)

Co-chairs	Affiliation
Suely Carvalho	Brazil, TEAP Senior Expert
Bella Maranion	USA, TEAP Co-chair
Shiqiu Zhang	China, TEAP Senior Expert
Members	
Omar Abdelaziz	Egypt, RTOC Co-chair
Daniel Colbourne	UK, RTOC member
Bassam Elassaad	Lebanon, RTOC member
Marco Gonzalez	Costa Rica, TEAP Senior Expert
Keiichi Ohnishi	Japan, MCTOC Co-chair
Elisa Rim	USA, US EPA
Rajendra Shende	India, TEAP Senior Expert
Sidi Menad Si-Ahmed	Algeria, TEAP Senior Expert
John Telesford	Grenada, Independent consultant
Helen Walter-Terrinoni	USA, FTOC Co-chair
Ashley Woodcock	UK, TEAP Co-chair

Approach

- TEAP established a Replenishment Task Force (RTF):
 - December 2019 (Montreal) – attended 84th ExCom meeting (ExCom-84) and conducted consultations
 - January 2020 (Montreal) – held RTF meeting and consultations with MLF Secretariat
 - February-June 2020 – held virtual meetings, presented to TEAP, additional consultations
- Estimates based on the “Consolidated BP of the Multilateral Fund for 2020-2022,” relevant decisions of ExCom-84, and information available through the MLF Secretariat.
- Relied on existing cost guidelines under the MLF, if available, where these remained under discussion in the ExCom (i.e., cost implications of parallel or integrated implementation of HCFC phase-out, cost guidelines for HFC phase-down activities and review of Institutional Strengthening).
- Estimates and tables cover the period to 2050, where available. NOTE: all tables and figures totals may not sum due to rounding.
- Presentation is based on May 2020 Final Report (posted 8 June) & Corrigendum (posted 6 July)

Outline of the Report

- Executive Summary and Intro (Ch. 1)
- Estimated Funding for HCFC Phase-out (Ch. 2)
- Estimated Funding for the HFC Phase-down (Ch. 3)
 - Methodology
 - Special Needs of LVC- and Very-Low-Consuming Countries
 - Kigali HFC Phase-Down Management Plan (KPMP) Preparation and Implementation
 - Stand-alone Projects
 - Ratification Scenarios of the Kigali Amendment
 - Opportunities for Early Activities to avoid growth of HFCs
- HFC Production Sector and HFC-23 By-product Emission Mitigation (Ch. 4)
- Institutional Strengthening (IS) and Standard Activities (Ch. 5)
- Estimate of Total Funding Requirement for 2021-2023 (Ch. 6)
- Indicative Funding Requirement for Future Triennia (Ch. 7)
- References & Annexes

Overview of the Multilateral Fund

- The Multilateral Fund for the Implementation of the Montreal Protocol was set up by the parties to the Montreal Protocol to assist developing countries to comply with the terms of the Montreal Protocol which sets out a timetable for the phase-out of ozone-depleting substances (ODS) in both developed and developing countries. The MLF provides assistance to A5 parties.
- Since its inception, the MLF has supported 148 A5 parties by providing US\$ 3.73 billion (including support costs) in project funding and capacity building to phase out over 283,000 ODP-tonnes in consumption and 188,920 ODP-tonnes in production of ODS.
- The total income received by the Fund by December 2019 was US\$ 4.07 billion.
- The MLF has also received additional voluntary contributions amounting to over US\$ 25.5 million from a group of donor countries to finance fast-start activities for the implementation of the HFC phase-down.

Replenishments of the MLF (US\$)

Triennium	Approved	Carry-over	Interest accrued	Total MLF Budget
1994-1996	\$ 455,000,000	\$ 55,000,000	N/A	\$ 510,000,000
1997-1999	\$ 466,000,000	\$ 74,000,000	N/A	\$ 540,000,000
2000-2002	\$ 440,000,000	\$ 35,700,000	N/A	\$ 475,700,000
2003-2005	\$ 474,000,000	\$ 76,000,000	\$ 23,000,000	\$ 573,000,000
2006-2008	\$ 400,400,000	\$ 59,600,000	\$ 10,000,000	\$ 470,000,000
2009-2011	\$ 400,000,000	\$ 73,900,000	\$ 16,100,000	\$ 490,000,000
2012-2014	\$ 400,000,000	\$ 34,900,000	\$ 15,100,000	\$ 450,000,000
2015-2017	\$ 437,500,000	\$ 64,000,000	\$ 6,000,000	\$ 507,500,000
2018-2020	\$ 500,000,000	\$ 34,000,000	\$ 6,000,000	\$ 540,000,000

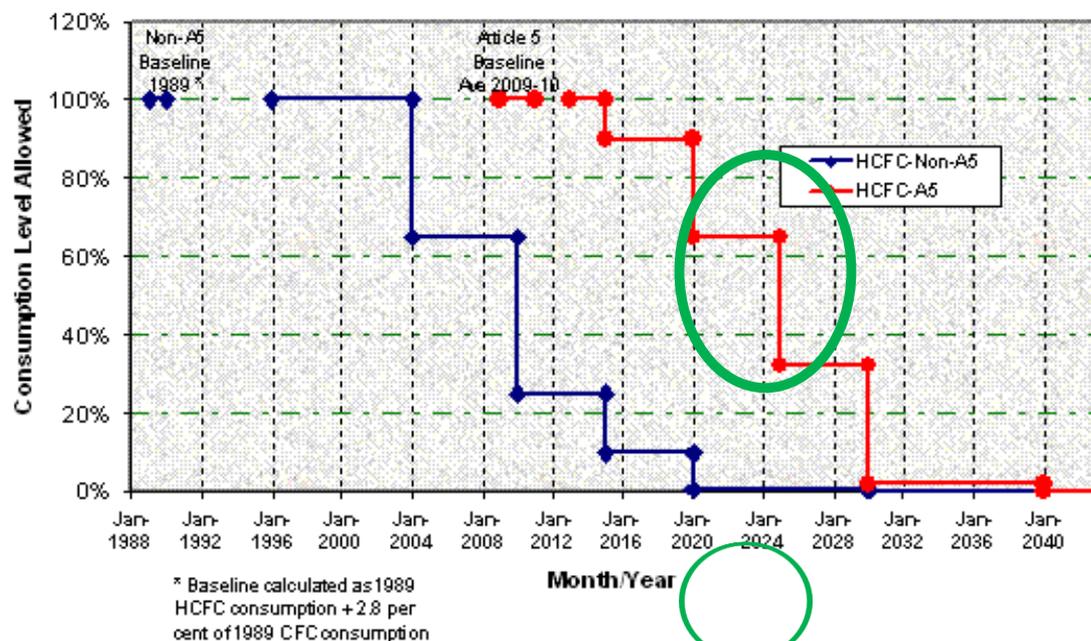


ESTIMATED FUNDING REQUIREMENT FOR HCFCs

HCFC Control Measures

Article 5(1) Parties: Consumption	
Base level:	Average 2009-10.
Freeze:	January 1, 2013.
10% reduction	January 1, 2015.
35% reduction	January 1, 2020.
67.5% reduction	January 1, 2025.
	January 1, 2030.
100% reduction	Allowance of 2.5% of base level consumption when averaged over ten years 2030-40 until January 1, 2040 for servicing of refrigeration and air conditioning equipment existing on 1 January 2030.

HCFCs (Annex C/I) Consumption Reduction Schedule



HCFC Phase-out Management Plans (HPMPs)

- To meet the compliance schedule, the HCFC Phase-out Management Plans (HPMP) guidelines set out a staged approach to the phase-out of a country's HCFCs within the framework of an overarching strategy.
- The ExCom set out the criteria for funding available for A5s and agreed on a structure for determining funding levels which considers, among other things, funding for preparation of HPMPs, overarching strategy, investment projects, sector specific cost effectiveness thresholds, the needs of small and medium-sized enterprises, and the concerns of Low Volume Consuming Countries (LVCs) and Very Low Volume Consuming Countries VLVCs.
- HPMP Key Concepts:
 - Baseline
 - Remaining eligible consumption
 - Cost effectiveness
 - Non-eligible consumption
 - LVCs (and VLVCs)

OVERVIEW OF HCFC FUNDING REQUIREMENT

HCFC consumption sector funding estimates include:

- Funding for approved HPMPs;
- Funding for project preparation costs;
- Funding for planned HPMPs;
- Estimated funding for additional HPMPs that will be needed if reduction targets are to be reached;
- Funding for verification; and
- Funding for technical assistance, if any.

HCFC production sector funding estimates include:

- Funding for project preparation, including audit and
- Funding for HPPMPs, including verification.

HCFC Methodology

- **Funding for Approved HPMPs:** approved funding tranches in 2021-2023 of US\$ 113.1 million.
- **Funding for Project Preparation:** estimated total of US\$ 1,954,050 for project preparation in this triennium (US \$1,729,050 plus approx. US\$ 225,000 for additional projects)
- **Funding for Planned HPMPs:** estimated funding requirement for planned HPMP of US\$36.9 million for this triennium based on the business plans. Amounts expected “beyond 2022” were estimated in 2023.
- **Funding for Additional HPMPs to Reach Target Reduction Percentages:** Reductions calculated based on the incremental reduction targets for each country (taking into account its baseline, starting points, cumulative reductions, and remaining eligible tonnage) to supplement projects not in the business plan that would impact compliance
 - Lower end: based on approved/planned HPMPs and the supplemental estimate for minimum amount calculated for certain parties to reach 54.5% reduction target by 2023
 - Higher end: based on approved/planned HPMPs and the supplemental estimate for minimum amount calculated for certain parties to achieve the 67.5% reduction target by 2023 instead of 2025
- **Verification and Technical Assistance**
 - HPMP Verification: A total of US\$ 589,000 per year of the triennium
 - Technical Assistance: The RTF has estimated range of zero to US\$ 1 million (PRAHA-III)

HCFC Consumption Sector Results

2021-2023 Triennium	LOW END	HIGH END
HCFC Consumption Sector		
HCFC Approved HPMPs	\$ 113,098,000	\$ 113,098,000
HCFC Prep Costs	\$ 1,954,000	\$ 1,954,000
HCFC Planned HPMPs	\$ 36,914,000	\$ 36,914,000
HCFC RTF Estimated HPMPs	\$ 24,313,000	\$ 135,077,000
HCFC Verification	\$ 1,766,000	\$ 1,766,000
HCFC Technical Assistance	\$ -	\$ 1,000,000
Subtotal - HCFC Consumption Sector	\$ 178,045,000	\$ 289,809,000

HCFC Production Sector

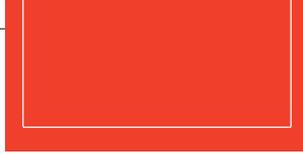
- Seven A5 parties produce HCFCs, with the total production reported as 23,227.9 ODP tonnes in 2018
- RTF estimated funding requirement for the HCFC production sector includes:
 - **Funding for Project Preparation:** Estimated zero in this triennium
 - **Funding for HPPMPs:** Two parties (India and China) need to address the funding requirements for HCFC production phase out during 2021-2023.
- The total funding requirement for the 2021-2023 triennium for the production sector is estimated to range from US\$ 71.2 million to US\$ 77.7 million

Estimated Funding Requirement: HCFCs

2021-2023 Triennium	LOW END	HIGH END
HCFC Consumption Sector		
HCFC Approved HPMPs	\$ 113,098,000	\$ 113,098,000
HCFC Prep Costs	\$ 1,954,000	\$ 1,954,000
HCFC Planned HPMPs	\$ 36,914,000	\$ 36,914,000
HCFC RTF Estimated HPMPs	\$ 24,313,000	\$ 135,077,000
HCFC Verification	\$ 1,766,000	\$ 1,766,000
HCFC Technical Assistance	\$ -	\$ 1,000,000
Subtotal - HCFC Consumption Sector	\$ 178,045,000	\$ 289,809,000
HCFC Production Sector		
HCFC Production Sector Prep	\$ -	\$ -
HCFC Production Sector HPPMPs	\$ 71,158,000	\$ 77,739,000
Subtotal - HCFC Production Sector	\$ 71,158,000	\$ 77,739,000

Indicative Figures for Transition to Low- or Zero-GWP Alternatives

- In response to Paragraph 3 of Decision XXXI/1, the RTF focused on providing examples of HCFC phaseout projects that transitioned to low- or zero-GWP alternatives
- Medium-Sized Manufacturing Country Example: Egypt
 - HCFC-141b to Cyclopentane **7.12 US\$/kg ODS**
 - HCFC-141b to HFO-1234ze/DME (60/40) blend **4.42 US\$/kg ODS**
- Small Manufacturing Country Example: Morocco
 - HCFC-141b to Cyclopentane: **5.32 US\$/kg ODS**
- Low-Volume Consuming Country Example: Costa Rica
 - Pilot for the “Replacement of a HCFC-22 refrigeration system by a R-717/R-744 (NH₃/CO₂) system in cold storage warehouse with a cooling capacity of 176 kW (50 TR) → **19.27 US\$/kg ODS [assuming 20 year life]**
 - Recovered 909 kg of HCFC-22 and avoided annual leaks of 1,314 kg of HCFC-22
 - Better temperature control with 10% reduction in the energy bill (first two months of operation)



ESTIMATING FUNDING REQUIREMENT FOR HFCS

MOP Decision XXXI/1: HFC Costs

- d) Decisions, rules and guidelines agreed by the Executive Committee at all its meetings, up to and including its eighty-fifth meeting, in determining eligibility for the funding of investment and non-investment projects;
- e) The need to allocate resources for Article 5 parties to comply with the Kigali Amendment to the Montreal Protocol, including the preparation and, if needed, the implementation of phase-down plans for hydrofluorocarbons (HFCs) that could include early activities in the servicing/end users sector in order to comply with the Kigali Amendment by addressing the high growth rate in HFC consumption;
- f) The need to allocate resources to the low-volume-consuming countries for the introduction of zero-global-warming-potential or low-global-warming-potential alternatives to HFCs and to maintain energy efficiency in the servicing/end users sector, in line with any relevant decisions of the Executive Committee;
- g) Three scenarios representing different potential levels of ratification of the Kigali Amendment when estimating the funding requirement for the phase-down of HFCs;
- h) The cost of supporting a limited number of stand-alone projects transitioning out of HFCs, in accordance with paragraph 4 of decision XXX/5;

Annex F: Hydrofluorocarbons

Applicable to production and consumption.

Non-Article 5 parties		Article 5 parties – Group 1		Article 5 parties – Group 2	
Baseline	Average HFC for 2011–2013 + 15% of HCFC baseline*	Baseline	Average HFC for 2020–2022 + 65% of HCFC baseline	Baseline	Average HFC for 2024–2026 + 65% of HCFC baseline
Freeze	–	Freeze	January 1, 2024	Freeze	January 1, 2028
10* per cent reduction	January 1, 2019	10 per cent reduction	January 1, 2029	10 per cent reduction	January 1, 2032
40* per cent reduction	January 1, 2024	30 per cent reduction	January 1, 2035	20 per cent reduction	January 1, 2037
70 per cent reduction	January 1, 2029	50 per cent reduction	January 1, 2040	30 per cent reduction	January 1, 2042
80 per cent reduction	January 1, 2034	80 per cent reduction	January 1, 2045	85 per cent reduction	January 1, 2047
85 per cent reduction	January 1, 2036				

* For Belarus, Kazakhstan, the Russian Federation, Tajikistan and Uzbekistan, 25% HCFC component of baseline and different initial two steps (1) 5% reduction in 2020 and (2) 35% reduction in 2025

Group 1: Article 5 parties not part of Group 2

Group 2: Bahrain, India, the Islamic Republic of Iran, Iraq, Kuwait, Oman, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates

Steps to Calculate HFC Indicative Figures

- Step 1: Establish Country Brackets (A through E)*
- Step 2: Calculate HFC Baseline using the 2016 TEAP Report**
- Step 3: Apply transition assumptions to HCFC Baseline to determine HFC Sector Distribution
- Step 4: Apply Cost Effectiveness Factors

*HFC consumption estimated separately for Group 1 and Group 2 Countries

** (Decision EX.III/1 Working Group Report: On the climate benefits and costs of reducing HFCs under the Dubai Pathway)

Step 1: Establish Country Brackets

Bracket (mt HCFCs)	Countries
A: >25,001	China
B: 10,001 – 25,000	Brazil, <i>India</i> , Mexico, <i>Saudi Arabia</i> , Thailand
C: 2,001 – 10,000	Argentina, Colombia, Egypt, Indonesia, <i>Iran</i> , <i>Kuwait</i> , Malaysia, Nigeria, <i>Pakistan</i> , Philippines, South Africa, Turkey, Venezuela, Vietnam, Yemen
D: < 2,000 non LVC	Afghanistan, Algeria, <i>Bahrain</i> , Bangladesh, Benin, Cameroon, Chile, Cote d'Ivoire, Dominican Republic, Gabon, Ghana, Guinea, <i>Iraq</i> , Jordan, Kenya, DPR Korea, Lebanon, Libya, Madagascar, Mauritania, Morocco, Nepal, Niger, <i>Oman</i> , Panama, Peru, <i>Qatar</i> , Senegal, Somalia, Sudan, Syria, Togo, Trinidad and Tobago, Tunisia, Uruguay
E: LVC	Albania, Angola, Antigua and Barbuda, Armenia, Bahamas, Barbados, Belize, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Congo, Congo DR, Cook Islands, Costa Rica, Cuba, Djibouti, Dominica, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Fiji, Gambia, Georgia, Grenada, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Jamaica, Kiribati, Kyrgyzstan, Lao PDR, Lesotho, Liberia, Macedonia FYR, Malawi, Maldives, Mali, Marshall Islands, Mauritius, Micronesia, Moldova Rep, Mongolia, Montenegro, Mozambique, Myanmar, Namibia, Nauru, Nicaragua, Niue, Palau, Papua New Guinea, Paraguay, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Serbia, Seychelles, Sierra Leone, Solomon Islands, South Sudan, Sri Lanka, Suriname, Tanzania, Timor Leste, Tonga, Turkmenistan, Tuvalu, Uganda, Vanuatu, Zambia, Zimbabwe

Group 2 parties highlighted in blue

Step 2: Calculate HFC Baseline

- HFC Baseline Formulas:

- Group 1 = $\left(100\% \times \frac{HFC\ 2020 + HFC\ 2021 + HFC\ 2022}{3}\right) + (65\% \times HCFC\ Baseline)$

- Group 2 = $\left(100\% \times \frac{HFC\ 2024 + HFC\ 2025 + HFC\ 2026}{3}\right) + (65\% \times HCFC\ Baseline)$

- Two methods were used to validate the HFC consumption in the 2016 TEAP report.
- The first method used the HCFC baseline in 2009/2010 and a growth rate of 3% from 2009 based on the International Monetary Fund Gross Domestic Product including the influence of exports of products containing refrigerant.
- The second method used the 2017 “IHS Markit” report fluorocarbon usage and refrigerant growth rate (7.8%) from 2017.
- The Task Force concluded that the 2016 TEAP methodology provided a reasonable approximation of the HFC portion of the baseline based on two validations.
- The Task Force did not create a baseline estimate based on the pandemic.

Step 3: Sector Distribution

RTF's sector distribution is estimated based on:

- Transition assumptions from HCFCs to HFCs and other products.
- HFC consumption in markets where HCFCs were not used.
- Market growth assumptions.
- Differentiation between country brackets.
- Differentiation between Group 1 and Group 2 countries.
- 3% growth in all markets per year from 2009.

Sector HFC Consumption Assumptions

- **HCFC-22 was assumed to convert to 1/3 HFCs for commercial refrigeration and 2/3 HFCs for AC.**
 - The AC sector was assumed to convert to 90% R-410A and 10% R-32.
- **Servicing of HCFC-22 replacements was also estimated by country bracket.**

HCFC-22 Conversion by Bracket	Refrigeration and Stationary AC Servicing	Industrial Commercial Refrigeration	Stationary Air Conditioning
Bracket A	25%	25%	50%
Bracket B	50%	17%	33%
Bracket C	50%	17%	33%
Bracket D	75%	8%	17%
Bracket E	100%	0%	0%

Sector HFC Consumption Assumptions (2)

- **The assumption for HFC-134a in domestic appliances and mobile air conditioning (MAC) are based on a percentage of the total HFC baseline.**
 - Domestic appliances: HFC-134a consumption estimated at 2% of HFC baseline.
 - MAC: HFC-134a consumption estimated at 6% of total baseline (HFC-134a).

Servicing

- MAC estimate includes servicing and refrigerant used in manufacturing new vehicles.

Bracket and Group Sector Percentage

	Servicing	Domestic Ref	ICR	Stationary A/C	MAC*	Foam XPS	Foam PUR	Aerosol	Fire Sup.	Solvents
Bracket A	20.8%	3.0%	31.5%	31.2%	9.0%	1.6%	1.3%	1.5%	0.0%	0.1%
Bracket B	42.5%	2.8%	21.4%	21.2%	8.5%	0.1%	1.9%	1.4%	0.1%	0.2%
Bracket B Group 2	40.9%	3.1%	20.6%	20.4%	9.4%	1.9%	1.9%	1.6%	0.1%	0.2%
Bracket C	42.2%	2.9%	21.3%	21.0%	8.7%	0.8%	1.5%	1.4%	0.1%	0.1%
Bracket C Group 2	40.6%	3.2%	20.5%	20.3%	9.5%	2.1%	2.1%	1.6%	0.0%	0.2%
Bracket D	65.0%	2.7%	10.9%	10.8%	8.1%	0.3%	0.7%	1.4%	0.0%	0.1%
Bracket D Group 2	65.4%	2.7%	11.0%	10.9%	8.0%	0.7%	0.0%	1.3%	0.0%	0.0%
Bracket E	87.7%	2.6%	0.1%	0.1%	7.8%	0.1%	0.1%	1.3%	0.0%	0.0%

* MAC includes MAC servicing

Step 4: Cost-Effectiveness Factors Groups 1 & 2

- Because there are no HFC Guidelines with agreed cost-effectiveness thresholds, the RTF based estimates on informed cost-effectiveness factors from HCFCs.

Bracket	Servicing	Domestic Ref	ICR	Stationary A/C	MAC	Foam XPS	Foam PUR	Aerosol	Fire Suppression	Solvents
Bracket A	\$4.80	\$9.00	\$9.50	\$8.00	\$7.00	\$4.75	\$4.75	\$5.00	\$5.00	\$20.00
Bracket B, C, D	\$4.80	\$11.00	\$12.00	\$9.50	\$8.50	\$5.00	\$5.00	\$5.00	\$5.00	\$20.00

- Servicing sector cost-effectiveness factor
 - Non-LVCs: \$4.80/kg
 - LVCs : Two methodologies were used to estimate costs for bracket E countries (discussed later).

Step 5: Calculation Results

- The Table below provides indicative figures for the **total cost of an HFC Phasedown for all countries** for the Consumption Sector to 80% (Group 1 countries) and 85% (Group 2 countries):
 - Includes deduction for exports, foreign/multinational ownership of enterprises & cutoff date,
 - Includes adjusted servicing sector costs for bracket E (Annex 8).

Unit	MMTCO ₂ eq	% of Volume	(US Dollars \$)	% of Funding	\$/mtCO ₂ eq
GRAND TOTAL	1,217	100%	\$ 4,120,800,000	100%	\$ 3.39
Bracket A	681	56%	\$ 2,205,500,000	54%	\$ 3.24
Bracket B	106	9%	\$ 356,800,000	9%	\$ 3.37
Bracket B Group 2	134	11%	\$ 457,000,000	11%	\$ 3.42
Bracket C	135	11%	\$ 455,000,000	11%	\$ 3.37
Bracket C Group 2	45	4%	\$ 153,100,000	4%	\$ 3.43
Bracket D	68	6%	\$ 193,900,000	5%	\$ 2.87
Bracket D Group 2	21	2%	\$ 58,300,000	1%	\$ 2.83
Bracket E	28	2%	\$ 241,300,000	6%	\$ 8.54

Calculation results for the 2021-2023 Triennium

- The Table below provides indicative figures (US\$) for the **total cost of an HFC Phase-down for all countries** for the Consumption Sector to 80% (Group 1 countries) and 85% (Group 2 countries) **for the 2021-2023 Triennium:**
 - Includes deduction for exports, foreign/multinational ownership of enterprises & cutoff date,
 - Includes adjusted servicing sector cost-effectiveness factor for bracket E

	2021	2022	2023	Total
Estimated %	Group 1: 1.25% Group 2: 0%	Group 1: 1.25% Group 2: 0%	Group 1: 1.25% Group 2: 0%	Group 1: 3.75% Group 2: 0%
Estimated Tonnage	18 MMTCO ₂ eq	18 MMTCO ₂ eq	18 MMTCO ₂ eq	55 MMTCO ₂ eq
Estimated Project Costs	Group 1: \$54 M Group 2: \$0	Group 1: \$54 M Group 2: \$0	Group 1: \$54 M Group 2: \$0	Group 1: \$162 M Group 2: \$0
Estimated Support Costs	Group 1: \$4 M Group 2: \$0	Group 1: \$4 M Group 2: \$0	Group 1: \$4 M Group 2: \$0	Group 1: \$12 M Group 2: \$0
Estimated Total Costs	Group 1: \$58 M Group 2: \$0	Group 1: \$58 M Group 2: \$0	Group 1: \$58 M Group 2: \$0	Group 1: \$174 M Group 2: \$0

HFC Ratification Scenarios

- **BAU**

- Based on business planning and RTF estimate for HCFC production and consumption sectors

- **Scenario 1: Ratified**

- Only countries that have ratified the Kigali Amendment

(62 A5 Parties as of April 3, 2020)

- **Scenario 2: Ratified + Letters of Intent**

- Countries that have ratified or submitted a letter of intent to ratify (139 A5 Parties as of April 3, 2020)

- **Scenario 3: All Countries**

- All 144 countries under Article 5 ratify the Kigali Amendment by 2023

Ratification Assistance (Enabling)

RTF considerations

a) Five A5 countries that **ratified and/or sent letters of intent to ratify** but did not get funding, could still apply for funding in the 2021-2023 triennium.

b) Five A5 countries that **did not ratify or send letters or send letters of intent** may ratify and/or send letters of intent and, therefore, qualify to apply for funding in the 2021-2023 triennium.

Range: US\$ 0.1- US\$ 1.9 million

Situation of VLVCs

Based on the TOR, RTF held informal consultations including with VLVCs (Annex 2). ExCom decision 79/46 : US\$ 50,000 for countries with less than 1 tonne. 21 VLVCs received this funding level. All other LVCs received US\$ 100,000.

RTF estimated as US\$1.01 million the total amount for **a one-time supplementary** funding to VLVCs at the level of US\$ 50,000 (plus support costs), to enable stakeholder consultation.

Total for Ratification Assistance (Enabling) based on Ratification Scenarios:

US\$ 1.1 million to US\$ 2.9 million

Stand-Alone Projects

The RTF estimated US\$ 14 million for a limited number of stand-alone projects, for the 2021-2023 triennium to consider under-represented regions and sectors, prioritizing stationary air conditioning, commercial refrigeration and mobile air conditioning sectors (decision 84/53).

In 2017 and 2018, a total of US\$ 14.4 million, including support costs, was approved in nine countries, for ten investment projects for the conversion from HFCs

The US\$14 million estimated figure in this Report is based on levels for stand-alone projects approved in the 2028-2020 Replenishment period, and was deducted from the funds calculated for KPMPs to avoid double counting.

Early Activities to Avoid HFC Growth

RTF looked at ExCom funding precedents to tackle this request, as follows:

1. Accelerating conversion projects/ sector plans in high-growth sectors

A total of US\$ 48.2 million (including support costs) was approved for 33 investment projects, for 18 A5 parties, 2 years after the accelerated HCFC phaseout was agreed upon in 2007.

The RTF considered **0-US \$ 50 million** as a range for different scenarios when suggesting advancing/ accelerating project submission in sectors with high growth of high-GWP HFCs used in manufacturing conversion.

2. Fostering Market Transformation at End-User- Potential Funding Window

- RTF looked at past experience in MLF funding window in the Chillers sector. It allowed for innovative programmes and co-funding partnerships. A funding window of US\$ 15.2 million was established by ExCom in 2005 for CFC-chillers replacement.
- The RTF considered a range of **0-US\$ 15 million** as example of a potential funding window levels to be considered in the 2021-2023 triennium for different scenarios.

Challenges and Considerations of the Servicing Sector for LVCs

Lessons Learnt from HPMP Implementation

Informal Consultations: There was an identified need to develop sustainable infrastructure to maintain high-quality servicing in an evolving work environment

Challenges:

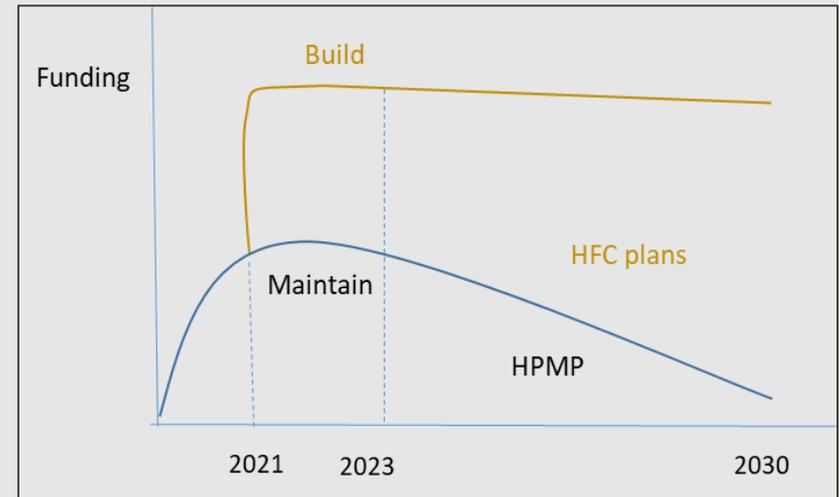
- **New Technology**
- **Policy and Market related activities**
- **Training/Awareness**
- **Strategy for Disposal/ Destruction**
- **New sectors**

Considerations:

- **Building the supply chain**
- **Reinforcing the Project Management Units (PMUs)**
- **Strengthen reporting and verification schemes**
- **Develop sustainable training and technician certification schemes**

“Maintain & Build” Activities for LVCs

- The HFC funding would need to build on the remaining portion of HPMPs in order to maintain the stability of infrastructure funding into the future;
- LVCs will be able to develop and maintain best practices in all areas,
 - Supply chain management;
 - reporting, project monitoring;
 - certification and standards;
 - Training; and,
 - integrating energy and climate programmes.



- The funding requirement for HFC phase-down in the **2021-2023 triennium** is estimated at **US\$ 11.3 million** based on the methodology with compliance targets.
- In order to support the “maintain and build” concept in the servicing sector, the RTF estimated **US\$ 57.5 million** in this triennium based on activities as shown in Annex 8.

Estimated Funding Requirement Summary – HFC Consumption Sector

2021-2023 Triennium	BAU / Business Planning	SCENARIO 1: RATIFIED	SCENARIO 2: RATIFIED + LETTERS	SCENARIO 3: ALL COUNTRIES
HFC Consumption Sector				
HFC Approved KPMPs	\$ -	\$ -	\$ -	\$ -
HFC Prep Costs	\$ 2,454,000	\$ 2,500,000	\$ 27,500,000	\$ 29,500,000
HFC Planned KPMPs	\$ 7,290,000	\$ 7,300,000	\$ 7,300,000	\$ 7,300,000
HFC RTF Estimated KPMPs	\$ -	\$ 23,300,000	\$165,300,000	\$174,000,000
HFC Stand Alone Projects	\$ -	\$ 14,000,000	\$ 14,000,000	\$ 14,000,000
HFC Ratification Assistance	\$ -	\$ 1,100,000	\$ 2,900,000	\$ 2,900,000
HFC Verification	\$ -	\$ -	\$ -	\$ -
HFC Early Activities to Avoid Growth	\$ -	\$ 10,000,000	\$ 65,000,000	\$ 65,000,000
Subtotal - HFC Consumption Sector	\$ 9,744,000	\$ 58,200,000	\$282,000,000	\$292,700,000

Funding Requirements for HFC Production Sector and HFC-23 Mitigation

- Six Parties produce HCFC-22 and HFC-23 by-product; three Parties ratified the Kigali Amendment.
- Argentina and Mexico had submitted their project proposals to ExCom.
- The HCFC-22 production facilities in the DPR Korea and the BR Venezuela have not built destruction facilities.
- In 2018, 99.8% of the HFC-23 generated at all HCFC-22 production plants, including the integrated facilities, had been incinerated or collected, stored and sold, and 0.22% had been vented.
- As China and India did not ratify the Kigali Amendment, and have their own country commitments to control HFC-23 by-product emissions, their cost for HFC-23 mitigation are not included in this RTF report.

Estimated Funding Requirement Summary – HFC Production Sector and HFC-23 mitigation

2021-2023 Triennium	LOW END	HIGH END
HFC Production Sector		
HFC Production Sector Prep	\$ -	\$ 2,000,000
HFC Production Sector KPPMP	\$ -	\$ -
HFC Production Sector Verification	\$ -	\$ -
HFC-23 Mitigation Prep	\$ -	\$ 200,000
HFC-23 Mitigation	\$ 6,400,000	\$ 26,100,000
Subtotal – HFC-23 mitigation and HFC Production Sector	\$ 6,400,000	\$ 28,300,000

Institutional Strengthening (IS)

Two scenarios included in the funding estimates

- **BAU** based on approved levels of funding, as of the ExCom-84 (**US\$ 31.5 million**).
- **Scenario A** considers projections for the 2021-2023 period based on **28% increase** from BAU and minimum values as per ExCom Decision 74/51 (**US\$ 40.3 million**).

Two scenarios NOT included in the funding estimates

In A5 interviews, parties all identified their need for additional funding to manage the increased workload due to the parallel implementation of Kigali Amendment related tasks, together with ongoing HCFCs phase-out activities. RTF provides estimates for two percentage increases over BAU to provide indicative figures:

- **Hypothetical Scenario B: 50% increase on BAU** - minimum of US\$ 63,750 per year (**US\$ 47.2 million**),
- **Hypothetical Scenario C: 100% increase on BAU** - minimum of US\$ 100,000 per year (**US\$ 62.9 million**).

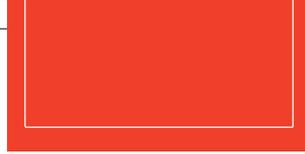
Standard Activities

The MLF Sec Costs, CAP, and Core Unit Costs are the same as in the 2020-2022 Business Plan, except for the estimate for 2023, which uses the same ExCom calculated increase based on the normal trend in the BP.

UNEP Compliance Assistance Programme	US\$ 36,383,000
UNDP, UNIDO, World Bank Core Unit	US\$ 18,153,000
MLF Secretariat Costs	US\$ 23,857,000
Treasurer	US\$ 1,500,000
Total (US\$)	79,893,000

Estimated Funding Requirement 2021-2023 – IS and Standard Activities (US\$)

2021-2023 Triennium	LOW END	HIGH END
Institutional Strengthening and Standard Activities		
Institutional Strengthening	\$ 31,457,000	\$ 40,265,000
UNEP Compliance Assistance Programme	\$ 36,383,000	\$ 36,383,000
UNDP, UNIDO, World Bank Core Unit	\$ 18,153,000	\$ 18,153,000
MLF Secretariat Costs	\$ 23,857,000	\$ 23,857,000
Treasurer	\$ 1,500,000	\$ 1,500,000
Subtotal - IS & Standard Activities	\$ 111,350,000	\$ 120,158,000



OVERALL ESTIMATE FOR 2021-2023 TRIENNIUM

Estimated Funding Requirement Results 2021-2023

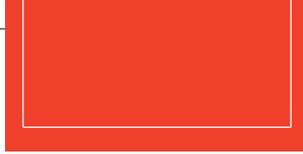
2021-2023 TRIENNIUM	LOW END WITH HFC BAU	LOW END WITH HFC SCENARIO 1	LOW END WITH HFC SCENARIO 2	HIGH END WITH HFC SCENARIO 3
SUBTOTAL - HCFC Activities	\$ 249,203,000	\$ 249,203,000	\$ 249,203,000	\$ 367,548,000
SUBTOTAL - HFC Activities	\$ 16,144,000	\$ 64,600,000	\$ 288,400,000	\$ 321,000,000
SUBTOTAL - IS & Standard Activities	\$ 111,350,000	\$ 111,350,000	\$ 111,350,000	\$ 120,158,000
GRAND TOTAL	\$ 376,697,000	\$ 425,153,000	\$ 648,953,000	\$ 808,706,000



FUTURE TRIENNIA ESTIMATES

Future Triennia MLF Replenishment Estimates

Triennia	Range	
	All countries ratify by 2023	All countries ratify by 2025
2024-2026	\$ 942,000,000	\$ 801,000,000
2027-2029	\$ 861,000,000	\$ 1,063,000,000



RESPONSES TO ONLINE COMMENTS

Approach

- 11 parties submitted comments to the online forum available for the replenishment report: Canada, UK, Norway, China, Australia, Japan, USA, Germany (on behalf of EU Member States), Mexico, Nigeria, and Switzerland.
- The RTF reviewed written comments over a very short time-frame.
- The RTF considered the need for consistency in its responses across three technical sessions.
- RTF considered categories of comments:
 - Corrections – addressed in supplementary report;
 - **Clarifications – provided in presentation, where possible;**
 - Beyond TOR or a requested change to analysis - requires discussion by parties; and
 - Statements/comments – noted.
- RTF approach is to respond to those requests for clarification in the presentation, where possible.

Overview of topics

HCFCs

- Modeling/methodologies for HCFCs Assessment of Funding
- HPMPs
- HCFC production sector

HFCs

- Modeling/ methodologies for HFCs Assessment of Funding
- HFCs ratification scenarios
- KPMPs
- Stand Alone projects/Ratification (Enabling) Assistance
- LVCs/ Servicing sector
- Early Activities to Avoid HFCs Growth
- HFC-23 mitigation

Institutional Strengthening and standard activities

HCFC Modeling

- What would be the impact on the funding requirement for HCFCs if each target used by the RTF was addressed by the MLF in the year previous to the target rather than during the year of the target itself?
- Some countries appear to have cumulative reductions far greater than 100%. Could the RTF explain why?
- In addition, more information regarding why it is expected that HCFC consumption in the refrigeration servicing sector are not in focus for the coming triennium, but seems to be expected in HPMP stage III and IV (as stated on page 11), would be appreciated.
- Is it necessary to be in rush to achieve 67.5% reduction target by 2023 instead of 2025?
- RTF estimate of \$36.9 is based on the information from the 2020-2022 adjusted MLF BP. Can the breakdown be provided for each year of 2021-2023?

HCFC Production Sector

- The HCFC production sector sub-group of ExCom has still not decided on the stage II HPPMP. This makes an exact prediction difficult. The figure given by the RTF for China, the single largest recipient, is indicated at a maximum of 71 million USD, which has not yet been negotiated.
- Would it be more appropriate to include a funding requirement for HPPMP of India only as part of the high end estimate for HCFC production? (regarding the final confirmation of the eligibility project)

HFC Modeling

- Could the RTF please elaborate on its assumptions regarding sector distribution of HFC consumption by each bracket and country group and rationale for selecting?
- Could the task force elaborate in detail how it calculated the costs of KPMPs for the 2021-2023 triennium?
- What are the quantities of HFCs (in metric tonnes and CO₂ eq) that would be funded for phase-down under KPMPs under each of the three scenarios, in total and for each bracket of countries, and differentiated among Kigali Group I and Group II countries?
- Assumptions for validation methods?

HFC Modeling (2)

- Table 3-6 - Not clear where 1217 million tonnes CO₂ comes from. In Table 3-2, estimated Kigali baseline = 1747 million tonnes CO₂. Ratio 1217 / 1747 is 69%. Phase-down target 80% for Group 1 and 85% for Group 2. That would give a 1411 million tonnes CO₂ cut based on data in Table 3-2. Also the figures in the MMTCO₂eq column total 1218 not 1217?
- Also in relation to the planned KPMPs, why did the RTF use the estimates in the Business plan instead of using the same methodology for estimating the other KPMPs?
- How did the RTF estimate the deductions for exports, foreign/multinational ownership of enterprises, and cutoff dates from the HFC Baseline?

HFCs Ratification Scenarios

- Request explanation on difference between scenario 2 and 3.
- Request more differentiation between scenario 2 (137 A5 parties) and 3 (144 A5 parties).
- Suggest alternate scenarios:
 - a) between scenarios 1 and 2; and
 - b) scenario where not all countries that sent a letter of intent ratified during the replenishment period.
- Consider timing for preparation and approval of the HFC Phasedown plan in the triennium.

Stand Alone/Ratification Assistance

◦ **Stand Alone Projects**

- How did you assess the need for an additional 14mIn USD for stand-alone HFC investments projects in the next triennium? Are these Stand Alone Projects duplicative of the KPMPs?
- How did RTF consider decision 84/53 and the fact that many projects have already been funded?
- How will these stand-alone projects be different and contribute short term, highly relevant information for the cost guidelines and to sustain HFC-reductions?
- Why did the RTF assume that stand-alone projects would be approved at the same rate as they have been, considering that KPMPs will start to be approved in the next triennium?
- Can the RTF provide a range of possible funding with \$14 million or less at the upper end?

◦ **Ratification Assistance (HFC Enabling Activities)**

- Could TEAP better clarify assumptions related to the chapter on “Kigali Ratification Assistance”
- And what is the relation in the TEAP assumption between the “additional support for VLVCs and the activities under discussion regarding operationalization of Decision XXX/5?

HFC Early Activities to Avoid Growth

- Would funding for early activities be additional to the total funding that would be eligible under KPMPs or would it substitute part of the funding for future KPMPs?
- Provide an explanation and the methodology for how the costs for these activities were estimated, including information specific to the individual activities identified.
- Reason for the difference in the estimated amount among three scenarios.
- Request alternative scenarios that illustrate the possible impact and benefits resulting from accelerated transitions to low or zero GWP alternatives under the HPMP, thus fostering an early sustained reduction of demand for HFCs in the A5.
- Why activities, such as buyers' clubs and market transformation programs, that do not have a bearing on compliance chosen to be included in these estimates?
- Expected outcome which will be brought by the early activities to avoid HFC growth. Present early activities on HFCs with regard to their impact on sustainability, environmental benefits and climate gains and costs for next 10-20 years.

HFC-23 Mitigation

- Did the RTF take into account that project submissions are estimates and projects are typically funded at a lower amount than originally submitted?
- For the HFC production sector in Argentina, why did the RTF use the high end figure of \$59m for closure when the last ExCom document (85/65) suggested the high end figure could be around \$6m instead?
- Could the RTF kindly clarify what funding activities are included as HFC-23 Mitigation costs in the Low-end and High-end estimates for the triennium 2021-2023?
- In relation to HFC production sector, clarification on the inclusion of DPRK for HFC-23 mitigation preparation cost on scenario 2 and 3 (High End).
- Did TEAP allocate the amount for DPRK because TEAP assessed that the activity in DPRK could be feasible while taking the compliance with the UN resolution into account?
- Whether RTF considered the “funding for sustained reductions only”?

IS and Standard Activities

◦ Institutional Strengthening

- Hypothetical Scenarios: word “hypothetical” somewhat prescriptive, and would rather see them included as alternatives aligned with the rest of the information in Table 5.2.
- What is the justification for the variation of scenarios, apart from increasing the amount of funding by 50% or 100%?

◦ Standard Activities

- Explain why costs of the MLF-Secretariat show an increase of 18%.
- What type and how much funding is provided through the UNEP CAP for LVCs and VLVCs for ratification?
- Has RTF ensured in its calculation that there are no overlaps between activities proposed under the HPMP, KPMP, LVC/VLVC and the CAP?

THANK YOU!



TEAP

14-16 July
2020