

Volume 7: Supplement to the May 2023 TEAP Replenishment Task Force Report

“Assessment of the Funding Requirement for the Replenishment of the Multilateral Fund for the Period 2024–2026”

October 2023

Suely Carvalho, Bella Maranion, and Shiqiu Zhang, co-chairs
on behalf of
TEAP Replenishment Task Force Members

Decision XXXIV/2: Terms of reference (TOR) for the Study on the 2024–2026 Replenishment of the Multilateral Fund (MLF)

To request the TEAP to prepare a report for the 35th MOP, and to submit it through the 45th OEWG to enable MOP-35 to adopt a decision on the appropriate level of the 2024–2026 replenishment of the MLF



That, in preparing the report, the Panel should take into account, among other things:

All control measures and relevant decisions agreed upon by the parties to the Montreal Protocol including MOP-34 and the Executive Committee (ExCom) of the MLF, **up to and including its 92nd meeting;**

The **special needs of low-volume-consuming (LVC) and very-low-consuming (VLVC) countries;**

The need to **allocate resources to enable all A5 parties to comply with Articles 2A–2J of the Protocol**, and the reductions and extended commitments made by A5 parties **under approved HPMPs and KIPs**

2023 Supplementary Report TEAP RTF Members

Suely Carvalho, Brazil, Bella Maranion, USA, Shiqiu Zhang, China (Co-chairs)

Omar Abdelaziz, Egypt

Jitendra Bhambure, India

Rick Cooke, Canada

Gabrielle Dreyfus, USA

Bassam Elassaad, Lebanon

Ray Gluckman, UK

Marco Gonzalez, Costa Rica

Mary Najjuma, Uganda

Keiichi Ohnishi, Japan

Philip Owen, UK

Marta Pizano, Colombia

Fabio Polonara, Italy

Elisa Rim, USA

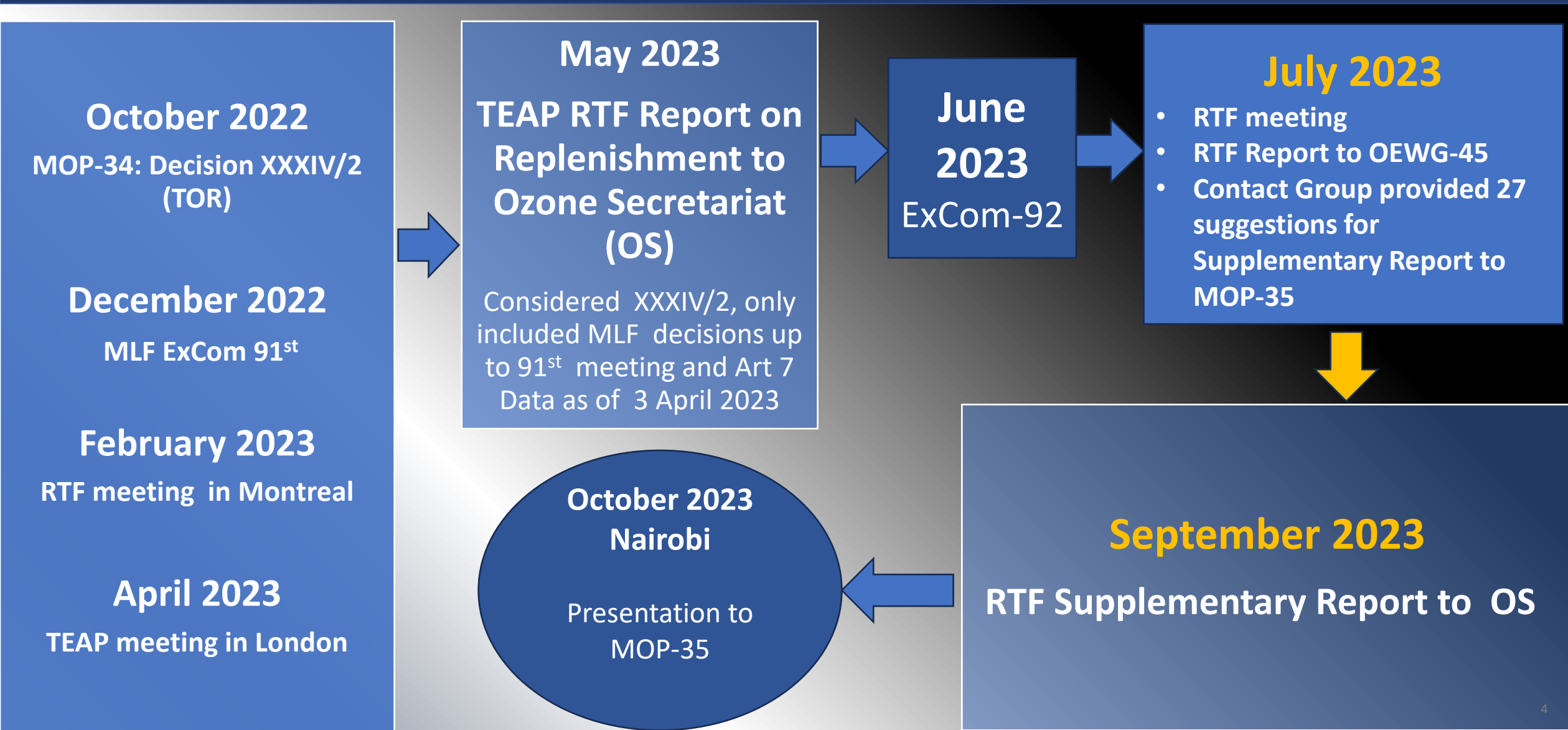
John Telesford, Grenada

Helen Tope, Australia

Helen Walter-Terrinoni, USA

CONSULTING EXPERTS: Brian Holuj (USA), Ana Maria Carreno Hoyos (Colombia), and Nihar Shah(India)

TEAP Replenishment Task Force (RTF) Reports and Timelines 2022 and 2023



HCFC and HFC Control Measures 2024-2026, and 2027-2029 and 2030-2032

Article 5(1) Parties: HCFC 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.
100% reduction	<p>January 1, 2030.</p> <p>Allowance of 2.5% of base level consumption when averaged over ten years 2030-40 until January 1, 2040, for equipment existing on 1 January 2030.</p>

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

TEAP RTF September 2023 Supplementary Report

CHAPTER 1: Introduction

CHAPTER 2: Updates the estimated funding based on

- 92nd ExCom decisions, guidance, and discussions
- new Article 7 data up to 7 August 2023
- **CHAPTERS 3-7: Responds to list of 27 items*** suggested by parties at the OEWG-45
- **ANNEXES**

* <https://ozone.unep.org/meetings/45th-meeting-open-ended-working-group-parties/post-session-documents>

Chapter 2: The RTF Approach to the Supplementary Report

- Chapter 2 of the **September 2023 RTF Report** presents the **updated estimated funding** requirements by considering
 - relevant decisions taken at the 92nd meeting of the ExCom
 - new baselines from 70 parties that reported data by 7 August 2023
 - assumed all parties ratify the Kigali Amendment by 2026.

This “**Updated Estimated Funding**” was then used as the basis to consider the 27 items suggested by parties at OEWG-45

RTF Country “Brackets” are the same as in May 2023 report

Country Bracket	Countries
A	China
B	Brazil, India , Mexico, Saudi Arabia , Thailand
C	Argentina, Colombia, Egypt, Indonesia, Iran , Kuwait , Malaysia, Nigeria, Pakistan , Philippines, South Africa, Turkey, Venezuela, Vietnam, Yemen
D	Afghanistan, Algeria, Bahrain , Bangladesh, Cameroon, Chile, Cote d'Ivoire, DPR Korea, Dominican Republic, Ghana, Guinea, Iraq , Jordan, Kenya, Lebanon, Libya, Mauritania, Morocco, Oman , Panama, Peru, Qatar , Senegal, Somalia, Sudan, Syria, Trinidad and Tobago, Tunisia, Uruguay
E (LVCs)	Albania, Angola, Antigua and Barbuda, Armenia, Bahamas, Barbados, Belize, Benin , Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cook Islands, Costa Rica, Cuba, DR Congo, Djibouti, Dominica, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Fiji, Gabon , Gambia, Georgia, Grenada, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Jamaica, Kiribati, Kyrgyzstan, Lao PDR, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Marshall Islands, Mauritius, Micronesia, Mongolia, Montenegro, Mozambique, Myanmar, Namibia, Nauru, Nepal, Nicaragua, Niger , Niue, North Macedonia, Palau, Papua New Guinea, Paraguay, Republic of Moldova, 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, Timor-Leste, Togo , Tonga, Turkmenistan, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Zambia, Zimbabwe

Chapter 2: Countries in Bracket A to D (non-LVCs)

HFC Cost Effectiveness Factors for Different Sectors

Sectors	C.E. based on:	US\$/kg
Refrigeration and Air Conditioning (RAC) Servicing	Agreed CE	\$ 5.10
Domestic Refrigeration	Agreed CE	\$ 13.76
Industrial Commercial Refrigeration (ICR)	HPMP	\$ 15.21
Stationary Air Conditioning	Avg. TEAP	\$13.00
Mobile Air Conditioning (with Servicing)	Avg. TEAP	\$ 5.00
Foam XPS (extruded polystyrene)	HPMP	\$ 8.22
Foam PUR (polyurethane)	Agreed CE	\$ 9.00
Aerosol	Avg. TEAP	\$ 5.00
Fire Suppression	Avg. TEAP	\$ 4.00
Solvents	Avg. ODS Phaseout Plans	\$ 29.12

Chapter 2: Countries in Bracket E - LVCs

Applying Decision 92/37 as at 92nd ExCom

Average HFC consumption in servicing in baseline years (metric tonnes)	Funding for meeting the 10 per cent Montreal Protocol HFC reduction target (US\$)*
>0 <15	135,000
15 <40	145,000
40 <80	158,000
80 <120	170,000
120 <160	180,000
160 <200	190,000
200 <300	325,000
300 <360	360,000

*Plus 20 per cent funding for countries committing to reduce consumption by 10 per cent of the average HFC consumption in the baseline years.

RTF estimated funding for a 10% reduction from the HFC baseline, spanning over five years of implementation.

Chapter 2: HFC Baseline updated by additional A7 data (as of 7 Aug 2023)

HFC Baseline (May and September 2023 Update)

Country Bracket	May 2023 HFC BASELINE (MMTCO ₂ e)	Sept 2023 HFC BASELINE (MMTCO ₂ e)
Total All	1,643	1,840

Chapter 2: Updated Estimated Funding for HCFCs (million US\$)

HCFCs	May 2023	Sept 2023 Update	Change
HCFC Consumption Sector			
HCFC Approved HPMPs	116.7	123.2	6.4
HCFC Prep Costs	0.17	2.8	2.7
HCFC Estimated HPMPs (including LVCs/VLVCs)	205.4	195.6	(9.8)
HCFC Verification	1.8	1.8	No change
HCFC Energy Efficiency Special Funding	11.1	10.2	(0.87)
Subtotal – HCFC Consumption Sector	335.2	333.6	(1.6)
HCFC Production Sector			
HCFC Production Sector Stage I PRP	0.15	0.15	No changes in HCFC Production Sector
HCFC Production Sector Stage I HPPMP	5.4	5.4	
HCFC Production Sector Stage II HPPMP	23.2	23.2	
Subtotal – HCFC Production Sector	28.7	28.7	
SUBTOTAL - HCFC Activities	363.9	362.3	(\$1.6M)

Chapter 2: Updated Estimated Funding for HFCs (million US\$)

HFCs	May 2023	September 2023	Change
HFC Consumption Sector			
HFC Approved KIPs	-	0.434	0.434
HFC Prep Costs (including gender)	16.8	20.5	3.6
HFC RTF Estimated KIPs	449.4	569.6	120.2
HFC Enabling Activities	1.01	1.01	No change
HFC Energy Efficiency Funding Window	20	19.9	(0.3)
HFC Technical Assistance	-	0.678	0.678
Subtotal – HFC Consumption Sector	487.2	612.1	124.9
HFC Production Sector			
HFC Production Sector Prep	2	2	No changes
HFC Production Sector KPPMP RTF Estimated	20	20	
HFC-23 Mitigation Prep	0.19	0.19	
HFC-23 Mitigation Approved	1.7	1.6	(0.1)
HFC-23 Emissions Control	8	8	
Subtotal – HFC Production/HFC-23	31.9	31.8	(0.1)
SUBTOTAL - HFC Activities	519.1	643.9	\$125M

SUMMARY: Updated Estimated Overall Funding Requirement for 2024-2026 (million US\$)

Activities	May 2023 RTF Estimate	Sept 2023 RTF Update	Change
SUBTOTAL - HCFC Activities	363.9	362.3	(1.6)
SUBTOTAL - HFC Activities	519.1	643.9	125
SUBTOTAL - EOL/Disposal	13.6	13.6	0
SUBTOTAL - IS & Standard Activities	121.6	121.6	0
TOTAL	1,018	1,141	\$123M

Additional Information and Scenarios as Suggested by OEWG-45 List of 27 Items

Supplementary Report Chapter 3

Overall suggestions/methodological approach

- Where methodology was the same as used in RTF May Report, the updated funding presented in the September Supplementary Report was used as the basis
- Where parties suggested new methodologies, RTF addressed them item- by- item.
- When data were insufficient, a qualitative assessment was provided.
- The range of funding for this triennium depends on which scenarios parties may wish to use, combine, or discard.
- In this short presentation, the focus is on items with the largest funding impact and those that may need additional clarification

OEWG-45 List of 27 Items: Scenarios Impacts on Funding

List Item	Suggestions/ Scenarios	US\$ Impact / change for Suggested Item
Item 1	Where the RTF uses cost estimates for specific activities drawn from the MLF business plan, include a scenario with a discounting approach...	(\$ 3.71 million)
Item 2	2 scenarios estimating the funding for the HCFC phase-out and HFC phase-down based on the actual consumption...	(\$ 168.5 million)
Item 3	Adjust the funding estimated for the HCFC phase-out and HFC phase-down by taking into account submissions at the 93rdExCom...	No adjustment. Only information that \$ 146 million could be potentially approved at ExCom93
Item 4	Adjust all elements of the funding requirements based on any relevant decisions taken at the 92nd ExCom;	Updated in September Report \$ 123 million increase
Item 5	Scenario, wherein some A5 parties submit proposals to phase down HFCs in advance of applicable compliance targets...	\$4.9 million increase (forward shift from future triennia)
Item 6	Estimate funding for new HPMPs, identifying sectors based on remaining HCFC consumption, and apply CE factors to calculate funding need	\$ 420 million (different methodology to estimate funding)
Item 7	Consider scenario removing the HCFC production phase-out plan for India, not included in consolidated BP of ExCom	(\$ 5.48 million)
Item 8	Review the funding requirement for HPMP prep funding to account for all the countries identified to require new HPMPs in the 2024–2026 triennium;	Updated September Report \$ 2.84 million
Item 9	Develop a scenario estimating funding for KIPs for Group 1 and Group 2 countries which have ratified KA, assuming that 90% of Group 1 and 30% of Group 2 countries request funding;	(\$124 million)

OEWG-45 List of 27 Items: Scenarios Impacts on Funding (cont.)

List Item	Suggestions/ Scenarios	US\$ Impact / change for Item
Item 10	A scenario for frontloading funding for KIPs during 2024–2026, taking lessons learned from the implementation of HPMPs;	\$ 30.7 million
Item 11	Reviewing KIPs preparation funding to account for all the countries identified to require KIPs in the 2024–2026 triennium;	Updated in September Report \$ 3.56 million increase
Item 13	When estimating the funding for KIPs, apply CE for manufacturing sectors [based on MLF historical experience and/or a technical assessment of the costs to transition to alternatives..]	(\$ 106 million)
Item 14	Review funding for phase-down HFC production and HFC-23 by-product mitigation, [based on a technical assessment of the costs to the extent possible..]	(\$10.3 million - \$11.7million)
Item 15	A scenario for funding 10 to 15 individual investment projects;	\$21 million
Item 16	A scenario to address the challenges for SMEs including safety issues, including in the installation and assembly sectors in KIP implementation	\$114 to \$228 million (Manuf.) (\$68 to \$203 million (A&I)
Item 17	Evaluate cost implications of leapfrogging and/or taking early action to phase down HFCs in advance of compliance targets	\$4.9 million
Item 27	Scenario for EOL activities under ExCom decision 91/66 where only 30 % of countries request funding during this replenishment.	(\$9.15 million) reduction

OEWG-45 List of 27 Items: Qualitative and/or quantitative assessment and information provided

List Item	Suggestions/ Scenarios	Remarks
Item 12	A scenario prioritizing the manufacturing sectors for non-LVCs;	Qualitative info provided
Item 18	A scenario for funding 10 to 15 energy efficiency pilot projects;	Only examples to fit existing EE funding window of 20 million.
Item 19	Include a scenario wherein incentive is provided ...to enhance EE while phasing down HFCs in accordance with ExCom decision 92/38;.	Incentive examples provided with cost range for different sectors.
Item 20	Consider activities to support SMEs in design and development of EE technology and their implementation;	Examples and Cost information provided
Item 21	Consider EE related policies and regulations capacity building;	Information provided
Item 22	Consider additional costs for energy efficient foam products;	Qualitative Information provided and some cost info in Annex
Item 23	Consider regional testing centers for monitoring and verification of energy efficiency;	Information provided
Item 24	Analyse additional costs for including EE as an incentive for... HFC-phase down and leapfrogging HFCs in the frame of the HPMPs and KIPs;	information on incentive approach provided.
Item 25	Provide cost estimates of potential support for systemic approaches to EE in KIPS, beyond the pilot window;	Scenarios varied (ranging from conversion pilots to national policies and regional centres with suggested costs
Item 26	Provide estimates of costs of managing ...[EOL]	Information provided

Item 1: Scenario with Discount Approach

Item 1: “Where the RTF uses cost estimates for specific activities drawn from the MLF business plan, include a scenario with a discounting approach as applied by previous replenishment reports.”

Change to 2024–2026 Triennium Estimated Funding		Applied 24% discount
Activities Drawn from BP by RTF (million US\$)		
HFC Prep Costs (including gender mainstreaming)	20.4	18.7
HFC Technical Assistance	0.68	0.52
HFC-23 Emissions Control	8.0	6.1
SUBTOTAL	29.0	25.3
CHANGE (REDUCTION) IN ESTIMATED FUNDING		(\$3.7M)

Item 2: Scenarios for Estimating Funding Based on Actual Consumption

Item 2: “Include [two] new scenarios for estimating the funding for the HCFC phase-out and HFC phase-down that are based on the actual consumption (or estimates of such consumption when not reported) to be reduced for countries to meet compliance targets including both the freeze target and the 10% reduction target for the HFC phase-down and ranges for the respective funding requirements to account for uncertainties.”

2024–2026 Triennium Estimated Funding in September RTF Report (million US\$)		Item 2 Scenario (million US\$)
HCFC Consumption Sector		
HCFC Estimated HPMPs (including LVCs/VLVCs)	195.6	191.6
HFC Consumption/ Sector		
HFC RTF Estimated KIPs (65% HCFC portion deducted from HFC baseline)	569.6	405.1
SUBTOTAL	765.2	596.7
CHANGE (REDUCTION) IN ESTIMATED FUNDING		(\$ 168.5M)

Item 3: Adjust Funding Estimates Based on Potential Approvals at ExCom-93

Item 3: “[Adjust] the funding estimated for the HCFC phase-out and HFC phase-down by taking into account potential approvals of projects and project preparation requests at the 93rd meeting of the ExCom.”

To provide parties with very preliminary estimates, RTF :

- Applied 24% discount to the 2023 BP activities according to Table 3-4 of the Supplementary Report (= US\$ 175.6 million)
- Deducted 92nd ExCom Approvals (- US\$ 29.2 million)

Estimated funding for potential approvals at ExCom-93: US\$ 146 million

Chapter 4

Additional Information and Scenarios : HCFCs

Item 6: Estimate funding in sectors likely to be addressed by new HPMPs

Item 6: “When estimating the funding requirement for new HCFC Phaseout Management Plans (HPMPs), identify the sectors that would likely be addressed by these HPMPs, based on remaining HCFC consumption per sector, and apply cost effectiveness factors to calculate funding for these sectors that are based on historical experience under the MLF;”

Substance	Remaining Metric tonnes	Cost effectiveness - US\$/kg	Total phaseout US\$ Million	This Triennium US\$ Million (without SC)
HCFC-22 (non-LVCs)	123,344	11- Manufacturing 4.8 - Servicing	783.0	336.0
HCFC-22 (LVCs)	1,401	Based on ExCom Dec 74/50	14.0	14.0
HCFC-141b	1,321	10.13 - Solvent 7.83 – Foam Manufacturing	10.49	4.5
HCFC-142b	7,633	8.22- XPS Foam	62.74	26.89
HCFC-123	544	4.8 - RAC servicing	2.61	1.12
HCFC-124	495	4.8– RAC servicing/fire suppression	2.38	1.02
HCFC-225 (ca/cb)	57	10.13 – assumed solvent	0.58	0.25
Total	134,795		\$ 875.8 M	\$383.5 M (\$420 M with sup.. costs)

Chapter 5

Additional Information and Scenarios : HFCs

Item 5: Scenario for Some A5 Parties to Submit Proposals in Advance of Compliance Targets

Item 5: “Include a scenario, wherein some Article 5 parties submit proposals to phase down HFCs in advance of applicable compliance targets in accordance with ExCom decisions 92/44 and 92/37;”

- RTF used its previous RTF methodology and analysed the HFC baseline and average 2020-2022 HFC consumption per country and by country brackets.
- Estimated room for growth that countries may have before reaching the 10% reduction compliance target by 1 January 2029
- Estimated 2028 consumption using a 3% growth rate compounded for 7 years (= 23% growth). And compared to an accelerated 2028 compliance target of 80% of the baseline (20% reduction), which advances the phase down by 10%.
- RTF then assumed that Group 1 countries who's projected 2028 consumption is 50% lower than the accelerated 2028 compliance target of 80% of baseline, might pursue a KIP in support of advanced phase-down. Group 2 countries were excluded based on these criteria. **Fourteen (14) countries fit under this scenario**, mainly LVCs (12).

With an estimated forward shift of KIP funding from future triennia- for these 14 countries, the increase within the 2024–2026 triennium is approximately US\$ 4.9 million .

Item 9: Scenario assuming 90% of Group 1 and 30% of Group 2 request funding

Item 9: “Develop a scenario estimating funding for KIPs for Group 1 and Group 2 countries which have ratified the Kigali Amendment assuming that 90% of Group 1 and 30% of Group 2 countries request funding”;

2024–2026 Triennium Estimated Funding (September 2023 updated estimates) in million US\$		Item 9 Scenario In million US\$ (%)
HFC RTF Estimated KIPs: Group 1	569.6	476.9 (90%)
HFC RTF Estimated KIPs: Group 2	0	11.6 (30%)
SUBTOTAL	569.6	488.5
		(\$123.9M)

This scenario reduces the updated estimated funding for the 2024–2026 triennium by about US\$ 124 million (inc. support costs)

Item 13: Funding requirement for KIPs applying CE factors for manufacturing

Item 13. Item 13: “When estimating the funding requirement for KIPs, apply cost effectiveness factors for manufacturing sectors that are based on historical experience under the MLF and/or a technical assessment of the costs to transition to alternatives, taking into account any available information from MLF documents, previous TEAP reports and other sources and ExCom agreed cost guidelines.”

- RTF considered the historical experience of economies of scale for Brackets A and B countries with manufacturing sectors and the average CE factors for Stage I and Stage II HPMPs; Applied a 25% CE factor adjustment across for manufacturing sector for brackets A and B countries.
- For servicing, used the CE value agreed at ExCom-92.

Item 13 Scenario	Cost in million US\$
Total KIP calculation (Sept 2023)	569,6
Total KIP applying 25% CE factor adjustment to brackets A & B	464
This scenario reduces the 2024-2026 updated estimated funding by US\$ 105.6 million	(\$105.6M)

Item 16 Addressing Challenges for SMEs

Item 16. “A scenario to address the challenges for SMEs including safety issues, including in the installation and assembly sectors in implementation of KIPs”

- Challenges in manufacturing and assembly & Installation (A&I) a subsector of servicing: lack and cost of R&D, lack of testing facilities, limited access to financing. Factors affecting SMEs: level of custom duties, MEPS, and market conditions allowing growth;
- Insufficient data on A&I and no clear definition of SMEs in manufacturing yet.

Sector	% of SMEs in Sector	Additional % needed	Funding at requested addition (million US\$)	Additional as % of sector funding
Manufacturing	20%	40%	399.1	8%
Manufacturing	40%	40%	798.3	16%
Assembly & installation (SVC)	10%	50%	203.1	5%
Assembly & installation (SVC)	30%	50%	609.4	16%

Item 19: Scenario Providing Incentive for KIPs to Enhance EE

Item 19: “Include a scenario wherein an incentive is provided as part of the funding for KIPs to enhance EE while phasing down HFCs in accordance with ExCom decision 92/38;”

Product	EE improvement	Incentive	Range [1] US\$	Units/Lines
Split AC	23% (CSPF 3.4 to 4.4)	19%	\$6-220M	25 million units 82 lines @ 300k units/line
	30% (CSPF 3.1 to 4.4)	43%	\$14-582M	
Domestic Refrigerators	16% savings in annual kWh	18%	\$17-130M	21 million units 112 lines @ 188k units/line
	21% savings	47%	\$44-340M	
Self-contained commercial refrigeration equipment	20% savings in annual kWh	22%	\$9-34M	2.2 million units 56 lines @ 39k units/line
	23% savings	47%	\$19-72M	

[1] Lower number is for factory upgrades only (additional capital costs); high number in range includes factory upgrade and two years of support for higher additional manufacturing production costs (additional operating costs).

Item 20: Activities to Support SMEs in EE Design and Development

Item 20: “Consider activities to support SMEs in design and development of energy efficient technology and their implementation;”

Additional costs for SME EE technology design and development (US\$)

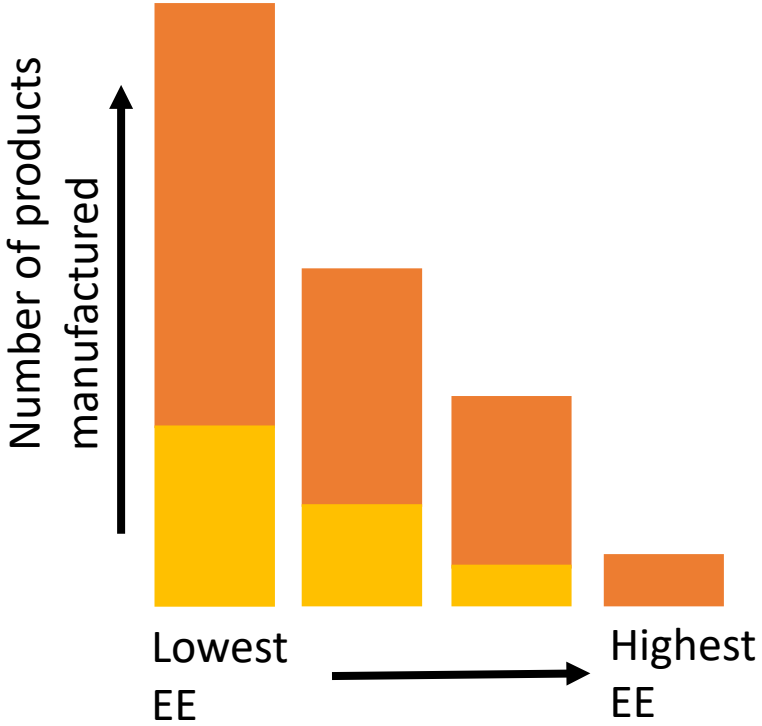
Activity/component	Adding EE to a new regional centre of excellence, US\$	Adding EE to an existing regional centre of excellence, US\$
Equipment modelling tools (software and hardware)	\$25,000	\$25,000
Training of trainer for product development process	\$35,000	\$35,000
Regional EE consultant	\$50,000/year	\$50,000 /year
Regional supply chain consultant	\$25,000/year	\$25,000/year
High RACHP training module with variable speed compressor	\$50,000	\$60,000
Testing Laboratory – RAC	\$1,000,000**	\$1,200,000**
Testing Laboratory – Refrigeration	\$600,000**	\$720,000**

Item 24 Leapfrogging in KIPs EE Example on Room AC

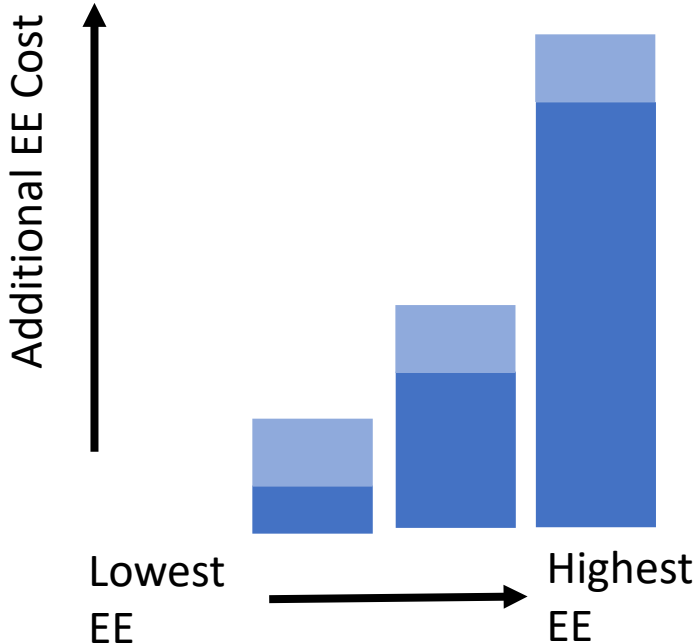
Item 24: “Analyze additional costs for including EE as an incentive for enhancing ambitious HFC-phasedown and leapfrogging HFCs in the frame of the HPMPs and KIPs”

EE improvement brackets	Example	Incentive Ratio	Market Distribution	Additional \$ for EE as incentive while leapfrogging / kg of refrigerant
More than 60%	Moving from a CSPF = 2.8 to 4.5	100%	5%	33.83
50 - 60%	Moving from a CSPF = 2.9 to 4.5 Or CSPF = 2.8 to 4.34	70%	10%	23.70
40 – 50 %	Moving from a CSPF = 3.1 to 4.5 Or CSPF = 2.8 to 4.06	50%	25%	16.92
30 – 40%	Moving from a CSPF = 3.3 to 4.5 Or CSPF = 2.8 to 3.8	30%	35%	10.15
20 – 30%	Moving from a CSPF = 3.6 to 4.5 Or CSPF = 2.8 to 3.5	15%	25%	5.07
Average additional costs for EE as incentive while leapfrogging (\$ for EE per kg of				13.11

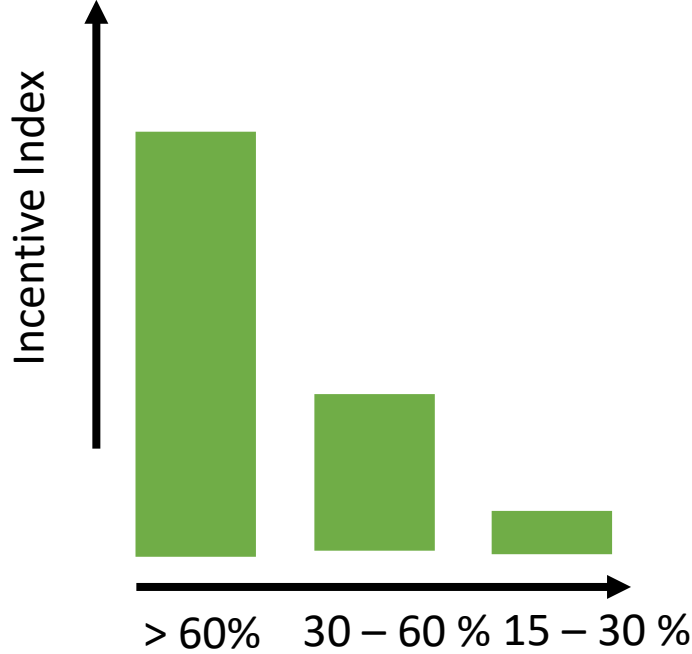
Panel A. Number of equipment units produced by EE level and enterprise EE capability



Panel B. Additional capital and operating costs by EE level



Panel C. Incentive as a function of EE improvement



Products made by higher capability enterprises
 Products made by lower capability enterprises

Additional capital costs
 Additional operating costs

EE bracket improvement

OEWG-45 Suggestions/Scenarios: Items 26 and 27

List Item	Suggestions/Scenarios	Change/ Impact of Scenario (US\$)	Report Section/ Remarks
End of Life, EOL			
Item 26	Provide estimates of costs of managing, reclamation, recycling, and cost effective destruction of banks	N/A	Supplementary Report provides scoping framework/ indicative costs that could be applied to estimating funding in future triennium once activities/ plans are prepared
Item 27	Consider a scenario for EOL activities under ExCom decision 91/66 where only 30 % of countries request funding during this replenishment.	(US\$ 9,2M)	Reduction of the updated estimated funding for 2024-2026 by \$9.2 million

THANK YOU FOR YOUR ATTENTION!

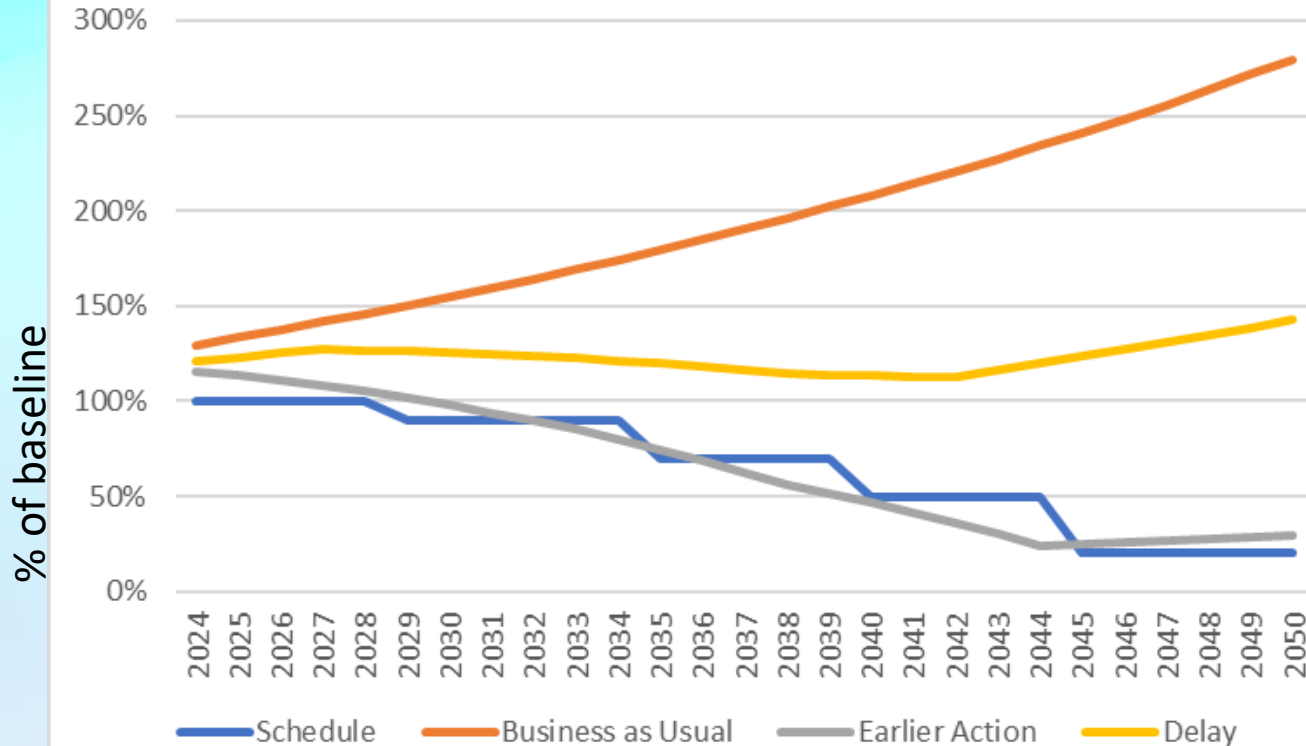
Backup slides

China's New HFC Baseline and Implications on Impact of the Overall Funding Estimation

HFC Estimated Funding for KIPs	2024-2026 Triennium/ Overall HFC Phasedown Costs (million US\$)		China HFC Baseline (MMTCO ₂ eq) TEAP RTF	Total Baseline (MMTCO ₂ eq)
	(includes support costs)			
Change to Overall Total				
HFC Estimated Funding for KIPs in RTF September Report	570	7,526	1,001	1,840
HFC Estimated funding for KIPs including new China official baseline	533	7,078	905	1,744
Difference	36,8	447,6	96	96
% Reduction	6%	6%	10%	5%

Item 5: Transition Priorities for Low-volume, Bracket E Parties

Bracket E - Example
AC GWP <500; 15-year lifetime



- “Delay” is a consumption estimate associated with replacement of higher GWP refrigerants in stationary AC and commercial refrigeration starting in 2028 and spanning 15 years.
- “Earlier Action” provides an estimate of average consumption if replacements start in 2024 and span 15 years.

Parties with significant servicing requirements and a baseline that is lower than or close to 2022 consumption may wish to consider incorporating refrigerant conversion in their KIPs. Parties may also wish to consider including equipment replacement projects in KIPs.

Item 7: Scenario removing HPPMP for India

Item 7: “Consider scenario removing the HCFC production phase-out plan for India that is not included in the consolidated BP of ExCom”

2024–2026 Triennium Estimated Funding: HCFC Production Sector		
	September 2023 Estimate (unchanged from May 2023)	Item 7 Scenario without India HPPMP (US\$)
HCFC Production Sector Stage I PRP	\$ 148,400	\$ 20,000
HCFC Production Sector Stage I HPPMP	\$ 5,351,600	\$ -
HCFC Production Sector Stage II HPPMP	\$ 23,232,000	\$ 23,232,000
Subtotal – HCFC Production Sector (including support costs)	\$ 28,732,000	\$ 23,252,000
REDUCTION IN ESTIMATED FUNDING BASED ON ITEM 7 SCENARIO		(\$ 5,480,000)

Item 8: Review of funding requirements for HPMP preparation

Item 8: “Review the funding requirement for HPMP preparation funding to account for all the countries identified to require new HPMPs in the 2024–2026 triennium;”

Total phase-out	HPMP prep US\$	Manufacturing in US\$	Total Cost US\$ (excluding support cost)
27 countries*	1,840,000	750,000	2,590,000

Increase in funding based on Item 8 is US\$2.84 million (inc. 9.6% support costs)

***31 out of 58 countries already have project preparation approved.**

Item 10: Frontloading Funding for KIPs

Item 10. “Add scenario for frontloading funding for KIPs during 2024–2026, taking into account the lessons learned from the implementation of HPMPs”

- HPMPs were frontloaded by 15% to achieve 10% reduction in consumption in stage I.
- RTF assumed LVCs need to be frontloaded by 50% in stage I and 50% of the stage in tranche 1 coinciding with the triennium.

	Total KIP Funding (Sept 2023) US\$	Stage I funding = 50% of total KIP US\$	Tranche 1 funding = 50% of stage I US\$
LVCs	174,833,000	87,416,000	43,708,000
Updated Estimates for LVCs in 2024-2026 triennium (Sept 2023 RTF Report)			13,002,000
This scenario <i>increases</i> the updated estimated funding for the 2024–2026 triennium by US\$ 30,706,000 .			30,706,000

Item 11: Review funding requirements for KIP preparation

Item 11. “Reviewing funding requirement for KIPs preparation funding to account for all the countries identified to require KIPs in the 2024–2026 triennium”

KIP Preparation		
Total Funding for KIP Preparation all countries (Sept 2023) US\$	Less for Countries already received KIP prep/ or to receive at ExCom 93rd (US\$)	KIP prep plus Investment project preparation Funding for the triennium, without support cost (US\$)
US\$ 8,565,000	US\$ 3,385,000	5,185,000 + 900,000* = US\$ 6,185,000 +9.6% agency support cost = \$ 6,778,760 <i>*Preparation of investment projects</i>
Gender Mainstreaming Action Plan preparation (as part of KIP prep)		
US\$ 13,590,000, detailed in the May report, was added to the KIP preparation requirement.		

The total revised for KIP prep (including gender mains.) is US\$ 20.4 million (rounded). An increase of US\$ 3.6 million as compared to May estimate , which was \$16.8 million)

Item 12: Scenario prioritising manufacturing sectors

Qualitative Assessment

Item 12. “A scenario prioritizing the manufacturing sectors for non-LVCs”

Sector	Benefit to Party	Benefit to other Parties
Non-refrigerant sectors (foams, aerosols excluding MDIs)	Reducing consumption for party	Minimum
AC manufacturing to low-GWP refrigerants	Reducing consumption for Party	<ul style="list-style-type: none"> ➤ Reduces new demand at other parties, example LVCs; ➤ Reduces HFCs phase-in from HCFC phase-out
MAC, domestic & commercial refrigeration	Ease of implementation due to availability of alternatives	Same as AC

Item 14: Review funding requirement for HFC production and HFC-23 mitigation

Item 14. “Review funding requirement for phase-down HFC production and HFC-23 by-product mitigation, [based on a technical assessment of the costs to the extent possible”

- Projects to phase-down HFC production considered on case-by-case (UNEP/OzL.Pro/ExCom/92/56);
- RTF drew from the experiences from the HCFC production sector phase-out and the HPPMP for CE values which ranged from US\$ 0.8/kg to 1.5/kg; but could be as low as US\$ 0.3/kg;
- By converting the CE of HFC production in \$/kg to CE in \$/CO₂eq tonnes of HFC production, the RTF derived a CE for China of approximately US\$ 0.44/ton of CO₂eq tonnes, and US\$ 0.78/ton of CO₂eq tonnes for DPRK and India;

	September 2023 RTF Report Updated (US\$)	Item 14 Scenario Estimates (US\$)	Potential change to updated funding requirement 2024– 2026 US\$
HFC Production Sector Prep	2,000,000	2,000,000	0
HFC Production Sector KPPMP	20,000,000	13,650,076	(6,349,924)
HFC-23 Mitigation Prep	193,000	150,000 – 193,000	(43,000 – 0)
HFC-23 Mitigation Approved (Argentina and Mexico)	1,613,571	1,613,571	0
HFC-23 investment project (India)	8,000,000	2,724,053 – 4,082,828	(5,275,947 – 3,917,171)
Subtotal – HFC Production and HFC-23 Sector	31,806,571	20,137,700 – 21,539,475	(11,668,871 – 10,267,095)

Item 15 Scenario for Funding 10-15 Investment Projects

Item 15: “A scenario for funding 10-15 individual investment projects;”

RTF proposed same sectors as in Item 18 (on EE pilot projects in Section 6.2) to respond to this request without computing energy efficiency additional costs

Sector	Total per Sector excluding preparation and support costs (US\$)
Residential and commercial AC/ HP sector	Up to 4 (large and small and medium ACHP enterprises (\$11 million))
Domestic refrigeration and/or stand-alone CR	Up to 2 large enterprises (\$ 4 million)
Stand-alone commercial refrigeration sector	Up to 2 SME and large enterprises (\$ 3 million)
TA for assembly and installation of large commercial and industrial refrigeration and/or ACHP	Up to 4 Regional projects (\$ 2 million)
[industrial refrigeration] TA for assembly and installation of large industrial refrigeration and/or ACHP	Up 2 regional projects (\$ 1 million)
TOTAL	\$ 21 million

Item 17 Evaluating the Potential Cost Implications of Leapfrogging and/or Early Action

Item 17: “Evaluate the potential cost implications of leapfrogging and/or taking early action to phase-down HFCs in advance of compliance targets”

Leapfrogging

- There is insufficient data available to evaluate cost implications, challenges and benefits of leapfrogging from high-GWP HFCs to low-GWP alternatives.
- Can be estimated when more data exist ; more KIPs are approved and implemented.

Early Action

- RTF analysed portion related to “early action” **exactly as in Item 5**, which requested RTF to *“Include a scenario, wherein some Article 5 parties submit proposals to phase down HFCs in advance of applicable compliance targets in accordance with ExCom decisions 92/44 & 37”*

There would be an estimated shift forward of KIP funding from future triennia to **increase the 2024–2026 triennium is approximately US\$ 4,861,000 for 14 countries (12 LVCs)**

Item 18: Scenario for Funding EE Pilot Projects

Item 18: “A scenario for funding 10 to 15 energy efficiency pilot projects;”

Pilot project sector	Cost per project (excluding support costs)	Total cost
Residential and commercial AC and HP sector conversions from HFCs to A3 that enhance EE by 5-10% (assumes conversion to A3)	<ul style="list-style-type: none"> Large ACHP enterprises with project cost of up to \$2,000,000 including additional capital and operating cost for product development, factory upgrades, and operating cost support. Small and medium ACHP enterprises with project cost of less than \$1,000,000 including additional capital and operating cost for product development and operating cost. 	\$9.0 M (5 projects)
Domestic refrigeration and/or SCCR conversions from HFCs to A3 that enhance EE by 5–10%	Large enterprises with project cost of up to \$1,500,000 including additional capital and operating cost for product development, factory upgrades, and operating cost support.	\$5.0 M (3 projects)
Stand-alone commercial refrigeration sector conversions from HFCs that enhance EE by 5–10%	SME and large enterprises with project cost of up to \$1,000,000 including additional capital and operating cost for product development, factory upgrades, and operating cost support.	
Technical assistance for assembly and installation of large commercial and industrial refrigeration and/or ACHP	<ul style="list-style-type: none"> \$50k per country for policy & awareness \$45k-150k for study tours \$200-800k (for non-LVC with multiple enterprises) to upgrade capacity to develop higher EE systems and install properly 	\$2.0 M (3 regional projects)

Funding Requirements for End-of-Life Management and Disposal

- TOR: “The need to **allocate resources for a funding window for activities to support end-of-life management and disposal of controlled substances in an environmentally sound manner**, in accordance with any relevant decisions by the ExCom”.
- The 91st ExCom decided to establish a funding window for the preparation of national inventories of banks of used or unwanted controlled substances and a plan for the collection, transport and disposal of such substances, and agreed on maximum funding levels for project preparation. consideration of recycling, reclamation and cost-effective destruction (Decision 91/66);

Funding Requirements for End-of-Life Management and Disposal (cont')

- RTF considered:
 - That e funding window criteria are applicable to all controlled substances and all sectors
 - That countries that have received funding are still eligible.
 - The historic period in which the previous projects were implemented under decision 58/19,
 - The input from IAs.

Funding Window Established for the Preparation of National Inventories of Banks of Used or Unwanted Controlled Substances and Action Plans

HCFC baseline (ODPt) Group	Decision 91/66 Funding (US\$)	Total No. of countries by Group	Total Funding by Group (US\$)
Below 1	\$ 70,000	22	\$ 1,540,000
Between 1 and 6	\$ 80,000	36	\$ 2,880,000
Above 6 and up to 100	\$ 90,000	62	\$ 5,580,000
Above 100	\$ 100,000	24	\$ 2,400,000
Total without support costs (US\$)		144	\$ 12,400,000
TOTAL with support cost of 9.6% average estimated by TEAP (US\$)			\$ 13,590,000

Future Triennia MLF Replenishment Funding Estimates: HCFCs

- Estimated funding for HCFC consumption 2027-2029 and 2030-2032:
 - The next HCFC phase-out compliance target is a 97.5% reduction from baseline by 1 January 2030.
 - 60 projects are estimated at US\$ 264 million over 3 years or US\$ 88.1 million per year in the years 2027, 2028, and 2029.
 - Support costs are estimated to be an additional US\$ 43.4 million.
 - RTF estimated a total of **US\$ 495 million for full phase-out of remaining HCFC consumption** through 2040 beyond what is already approved.
- Estimated funding for HCFC production in the next two triennia:
 - To achieve 100% target by 2030, additional efforts are needed for three countries (China, India and DPRK) to address their reduction and phasing-out of the production.
 - No agreements and decisions for funding for DPRK and India
 - Based on agreements and disbursements for China, a maximum funding requirement for HCFC production sector (China only, excluding India and DPRK) for the year of 2027-2029 amounts to **US\$ 195 million.**

Future Triennia MLF Replenishment Funding Estimates: HFCs

- HFC phase-down funding requirement estimates for the next two triennia consider the following:
 - Group 1 parties: a 30% reduction from baseline by 1 January 2035.
 - Group 2 parties: a freeze of production and consumption by 1 January 2028 and a 10% reduction from baseline by 1 January 2032.
 - Does not include possible funding requirements for HFC production in China, DPRK and India due to limited information, audits in process and pending issues.
 - Include the HFC-23 mitigation funding approved for Argentina and Mexico only.

Indicative Funding Requirement for Future Triennia: 2027-2029; 2030-2032

Triennium	ESTIMATED RANGE	
	Low-end	High-end
2024-2026	\$ 974,573,000	\$ 1,018,224,000
2027-2029	\$ 933,000,000	\$ 992,000,000
2030-2032	\$ 820,000,000	\$ 893,000,000