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**Open-ended Working Group of the Parties to  
the Montreal Protocol on Substances that  
Deplete the Ozone Layer  
Forty-second meeting  
Online, 14–16 July 2020\***

## **Report of the forty-second meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer**

### **Introduction**

1. Owing to the ongoing coronavirus disease (COVID-19) pandemic, it was not possible to convene the forty-second meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer as planned in Montreal, Canada, from 13 to 17 July 2020. Instead, the meeting took the form of online work, comprising an online forum for the submission of comments on the Technology and Economic Assessment Panel reports on (a) the replenishment of the Multilateral Fund for Implementation of the Montreal Protocol for the period 2021–2023, and (b) nominations for critical-use exemptions for methyl bromide, and an online meeting composed of three technical sessions held at different times on 14, 15 and 16 July 2020 in order to facilitate the participation of parties in the different world time zones. The online meeting, which was dedicated to the replenishment of the Multilateral Fund for the period 2021–2023, was co-chaired by Mr. Alain Wilmart (Belgium) and Mr. Obed Baloyi (South Africa).

### **I. Opening of the meeting**

2. The three technical sessions of the online meeting of the forty-second meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer were opened at 6 p.m. (Nairobi time (UTC+2)) on Tuesday, 14 July 2020 by Mr. Wilmart; at 12 noon (Nairobi time (UTC+2)) on Wednesday, 15 July 2020, by Mr. Baloyi; and at 8 a.m. (Nairobi time (UTC+2)) on Thursday, 16 July 2020, by Mr. Wilmart. An opening statement was delivered by Ms. Tina Birmpili, Executive Secretary of the Ozone Secretariat, at each of the three sessions.

3. In her statement, Ms. Birmpili welcomed participants, acknowledging that the present situation amid an ongoing pandemic was a strange and difficult time for everyone and expressing the hope that all the participants in the technical sessions and those whom they held dear were safe and well. The pandemic had hit the world hard, with hundreds of thousands of deaths and many more people falling ill, jobs lost and economies flagging. She extended the sympathies of the Ozone Secretariat to all those had suffered directly from COVID-19 or had endured the illness or passing of loved ones.

4. In such bleak times, the latest ratifications of the Kigali Amendment provided a source of inspiration. In June and July 2020, the Holy See, Liberia, Romania and Sierra Leone had ratified the amendment, bringing the number of parties that had done so to the milestone of 100. The Montreal

\* Owing to the coronavirus disease (COVID-19) pandemic, some agenda items were deferred to a later date.

Protocol and its amendments had a clear and obvious role to play in ensuring a healthy environment for all of humanity, both at present and in the future; it was crucial, therefore, to maintain the momentum.

5. Recalling the letter on the contingency plan for meetings of the ozone treaties in 2020 and 2021 that she had sent to parties outlining the possibilities for the subsequent round of meetings and that a decision would be taken in September 2020 after a thorough evaluation of the pandemic situation and consultations with parties and ozone bodies, she emphasized the importance of finding a reasonable and mutually agreeable way of continuing to work together. The Ozone Secretariat had striven to maintain its support to parties, including by ensuring that all the parties could take part in the discussions in the online technical sessions on an equal basis.

6. Turning to the business of the day, Ms. Birmpili thanked the replenishment task force of the Technology and Economic Assessment Panel for finalizing, against the backdrop of the pandemic, the report on the funding requirement for the replenishment of the Multilateral Fund for the period 2021–2023 and for its continuous commitment to supporting the parties. The task force would provide answers to any questions already posed through the online forum and participants would be able to ask further questions during the sessions.

7. She stressed the importance of the replenishment in a post-COVID-19 era. Many economies were expected to shrink as the result of the lockdowns and recovery was likely to take a long time. Nevertheless, the parties had a duty to “build back better” in the aftermath of the pandemic with robust and green cold chains in the food and medical sectors. That meant putting all efforts both into tackling climate change and into protecting and restoring the ozone layer, while providing opportunities for those who had been hardest hit to recover. The Secretary-General of the United Nations had been clear that investments in pandemic recovery should promote green and inclusive development, particularly through reducing greenhouse gas emissions. The provision of support to parties to reduce their consumption and production of HCFCs and HFCs was one such investment.

8. In closing, Ms. Birmpili thanked participants for their flexibility and willingness to adapt. If everyone continued in that spirit, the Montreal Protocol would continue to sit at the heart of humanity’s efforts to lead, to innovate and to create a better future.

## **II. Organizational matters**

### **A. Attendance**

9. The following parties to the Montreal Protocol were represented: Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belgium, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Cabo Verde, Cambodia, Canada, Chile, China, Colombia, Comoros, Costa Rica, Cuba, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Eswatini, European Union, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guyana, Honduras, Hungary, India, Indonesia, Iran (Islamic Republic of), Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Lao (People’s Democratic Republic of), Latvia, Lebanon, Lesotho, Libya, Lithuania, Madagascar, Malawi, Malaysia, Maldives, Mauritius, Mexico, Micronesia (Federated States of), Mongolia, Montenegro, Morocco, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Republic of Moldova, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Saudi Arabia, Serbia, Sierra Leone, Singapore, Somalia, South Africa, Sri Lanka, Suriname, Sweden, Switzerland, Syrian Arab Republic, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of), Viet Nam, Zambia, Zimbabwe.

10. The following United Nations entities, organizations and specialized agencies were represented: Secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol, the World Bank, the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO), the United Nations Environment Programme (UNEP).

11. The following intergovernmental, non-governmental and industry bodies and organizations were represented as observers: AGC Chemicals, Alliance for an Energy Efficient Economy, Alliance for Responsible Atmospheric Policy, Arkema Innovative Chemistry, Carrier Global Corporation, Centro Studi Galileo, CLASP, Daikin, Daikin Industries Ltd., Daikin United States Corporation, Environmental Investigation Agency, European Association of Refrigeration and Air Conditioning

Installers, Global Policy Associates, Gluckman Consulting, Halotron, HEAT International, ICF International, Institute for Governance and Sustainable Development, International Electrotechnical Commission, International Pharmaceutical Aerosol Consortium, Japan Refrigeration and Air Conditioning Industry Association, Manitoba Ozone Protection Industry Association, MEBROM, Mexichem UK Ltd., National Aeronautics and Space Administration Goddard Space Flight Centre, Natural Resources Defense Council, Nolan Sherry and Associates Ltd., PETRA, SHECCO, The Energy and Resources Institute, Topten International Services.

## **B. Adoption of the agenda**

12. The Working Group adopted the following agenda for the online technical sessions on the basis of the full provisional agenda for the forty-second meeting of the Open-ended Working Group set out in document UNEP/OzL.Pro.WG.1/42/1 and the shortened provisional agenda specific to the online meeting, applicable to the three sessions, set out in document UNEP/OzL.Pro.WG.1/42/2.Add.2:

1. Opening of the meeting.
2. Organizational matters:
  - (a) Adoption of the agenda;
  - (b) Organization of work.
3. Replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the period 2021–2023:
  - (a) Presentation of the Technology and Economic Assessment Panel task force report on the replenishment of the Multilateral Fund;
  - (b) Question and answer session.
4. Closure of the meeting.

## **C. Organization of work**

13. The Working Group agreed to the organization of work proposed by the Co-Chair for the technical sessions as outlined in document UNEP/OzL.Pro.WG.1/42/2.Add.2.

14. The Co-Chair recalled that the online forum had been opened on 8 June 2020 to enable parties to submit comments and questions relating to the report of the Technology and Economic Assessment Panel on the replenishment of the Multilateral Fund for the period 2021–2023. The comments received by 6 July 2020 had been shared with the Panel's task force on replenishment so that they could be addressed during the three technical sessions of the online meeting. During the technical sessions, the parties would have the opportunity to pose additional questions, make further comments and receive oral responses. The representatives of the task force would respond to questions posed via the online forum and the online chat, and by representatives during the meeting.

15. After the online meeting, parties would be able to submit, by 1 August 2020, further comments, requests for clarification or suggestions for additional information to be provided by Panel. The Co-Chairs of the Open-ended Working Group would consolidate that information in a document, which would be made available to the parties. The parties would have a week to review the document before it was passed on to the task force. If there were pending issues relating to the report that needed further clarification, the Panel would provide a response in the form of a note. The task force would not prepare its usual supplementary report until the parties had had the opportunity to negotiate and agree on its content.

16. The compilation prepared by the Co-Chairs would be the basis for the discussions by the parties at their next face-to-face meeting, when they would also address the need for the Panel to provide any supplementary scenarios or further information.

## **III. Replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the period 2021–2023**

17. Introducing the item, the Co-Chair recalled that, by decision XXXI/1, the Thirty-First Meeting of the Parties had requested the Technology and Economic Assessment Panel to prepare a report for submission to the Thirty-Second Meeting of the Parties, and to submit it through the Open-ended Working Group at its forty-second meeting, to enable the Thirty-Second Meeting of the Parties to

adopt a decision on the appropriate level of the 2021–2023 replenishment of the Multilateral Fund. Accordingly, the Panel’s replenishment task force had produced a report entitled “Assessment of the funding requirement for the replenishment of the Multilateral Fund for the period 2021–2023”, available as volume 3 of the Panel’s May 2020 report. A corrigendum had been issued to address some of the matters raised in the online forum following its initial publication, including to make factual corrections. The full report was available in English only, but the executive summary had been made available in the six official languages of the United Nations in the annex to document UNEP/OzL.Pro.WG.1/42/2/Add.1, which also provided a brief summary of the main findings of the report, in paragraphs 4 to 11.

18. A presentation on the report was made by Ms. Bella Maranion, Ms. Suely Carvalho and Ms. Shiqiu Zhang, co-chairs of the 14-member replenishment task force, comprising members of the Technology and Economic Assessment Panel, its technical options committees and outside experts. The presentation gave an overview of the report and estimated the funding requirements for the Multilateral Fund for the triennium 2021–2023 and for future trienniums, and provided responses to certain comments and questions received via the online forum prior to 6 July 2020. It was noted that any proposals to expand the scope of the terms of reference or modify the analysis, scenarios or assumptions would first need to be discussed and agreed by the parties. Other members of the task force, namely Mr. Omar Abdelaziz; Mr. Bassam Elassaad; Ms. Elisa Rim and Ms. Helen Walter-Terrinoni, also responded to questions as appropriate. All the representatives who took the floor thanked the Panel and the task force for their excellent report.

19. Ms. Maranion began by thanking the Ozone Secretariat, the Multilateral Fund Secretariat, the implementing agencies, bilateral agencies and all the parties for their support in the preparation of the report. Recalling the terms of reference for the report, as set out in decision XXXI/1, she outlined the approach to its preparation and the consultations that had taken place. Two representatives expressed regret that insufficient consultations had been carried out in their region to complement the analysis of challenges faced by low-volume-consuming (LVC) countries. Ms. Maranion took note of the comment and invited them to submit any additional information that they thought useful.

20. Ms. Maranion explained that the estimates in the report were based on the consolidated business plan of the Multilateral Fund for the period 2020–2022 (UNEP/OzL.Pro/ExCom/84/26), relevant decisions taken by the Executive Committee at its eighty-fourth meeting (UNEP/OzL.Pro/ExCom/84/75) and other available information. Where issues were still under discussion by the Executive Committee, such as cost guidelines for hydrofluorocarbon (HFC) phase-down activities, the review of institutional strengthening support and parallel or integrated implementation of the hydrochlorofluorocarbon (HCFC) phase-out and HFC phase-down activities, the task force had relied on existing cost guidelines under the Multilateral Fund.

21. The report comprised substantive sections on funding for HCFC phase-out; estimated funding for HFC phase-down; the HFC production sector and HFC-23 by-product mitigation; and funding requirements for institutional strengthening and standard activities. It also looked at indicative funding requirements for future trienniums. Ms. Maranion stressed the importance and successful nature of the Multilateral Fund in supporting activities by parties operating under paragraph 1 of Article 5 of the Protocol (Article 5 parties). Since its inception, the Multilateral Fund had supported 148 parties in achieving the phase-out of over 283,000 ozone-depleting-potential (ODP) tonnes of ozone-depleting substances in consumption and some 190,000 ODP tonnes in production. Replenishment had already occurred nine times.

## **1. Funding for HCFC phase-out**

22. Recalling the HCFC control measures for Article 5 parties and the HCFC phase-out management plan (HPMP) as the tool through which they would achieve them, Ms. Maranion presented an overview of the estimated funding requirement for HCFC phase-out for the period 2021–2023 in the consumption and production sectors. She then gave indicative figures for the transition to alternatives with low-global-warming potential (low-GWP) or zero-global-warming potential (zero-GWP).

### **(a) HCFC consumption**

23. The estimates for the consumption sector funding took into account: funding for approved HPMPs; funding for project preparation costs; funding for planned HPMPs; estimated funding for additional HPMPs that would be needed if reduction targets were to be reached; funding for verification; and funding for technical assistance. With regard to the potential additional HPMPs, the task force had calculated reductions based on the incremental reduction targets for each country, as

described in annex 5 to the report, based on its baseline, starting point, cumulative reductions and remaining eligible tonnage to supplement projects not in the business plan that would affect compliance. Given the 35 per cent reduction target in 2020 and the 67.5 per cent reduction target in 2025, there was a 32.5 per cent reduction to be achieved over the following five years, which equated to 6.5 per cent per year. The lower funding estimate showed what would be required for certain parties to achieve a 54.5 per cent reduction by 2023 and the higher estimate showed what would be needed to enable certain parties to achieve the 67.5 per cent reduction target by 2023 instead of 2025. The overall estimate for HCFC consumption ranged from \$178,045,000 to \$289,809,000 for the triennium 2021–2023.

24. Responding to a number of questions, Ms Maranion said the \$36.9 million estimated to be required for planned HPMPs in the triennium 2021–2023, which had been taken from the 2020–2022 business plan of the Multilateral Fund, could indeed be broken down by year. The total comprised: \$14.4 million for 2021; \$11.6 million for 2022 and \$10.8 million for 2023. The amounts in the business plan attributed to “after 2022” had been included in the task force’s estimates for 2023. She also said that the task force had estimated the cost requirement for the achievement of the 67.5 per cent reduction in 2023 as opposed to 2025 in order to provide some variation. She confirmed that was not obligatory for parties to achieve the 67.5 per cent target early.

25. In response to a request for more information regarding why it was expected that HCFC consumption in the refrigeration servicing sector would not be a focus of the triennium 2021–2023, but seemed to be expected in stages III and IV of HPMPs, Ms. Maranion explained that the reductions in consumption in the report were not broken down by sector. The calculations were based on the overall compliance targets. The bulk of the estimated HPMP costs came from approved agreements between the country and the Executive Committee, while figures relating to tranches and planned HPMPs were taken from the 2020–2022 consolidated business plan.

26. Several representatives, recalling that HCFC reduction targets were to be met by 1 January of the target year, suggested that the task force’s calculation of funding requirements would be more accurate if they planned for the target to be met by the end of the previous year. Ms. Maranion said that the task force’s approach could indeed be modified if parties so wished and she acknowledged that it would change the estimates. Giving an example of a potential impact, she said that the estimated funding required for HPMPs to ensure a reduction from the baseline of 61.5 per cent rather than 54.5 per cent by 2023 would be approximately \$79.7 million as opposed to \$24 million. As the funding was distributed evenly across the years, this amount was calculated by adding to the \$24 million half of the additional amount required to meet the reduction target of 67.5 per cent.

27. In response to questions about why, in annex 5 to the report, on estimation of the HCFC reduction needed, some countries appeared to have cumulative reductions of far greater than 100 per cent, Ms. Maranion and Ms. Rim explained that, using the best available information at the time, the task force had calculated residual consumption in relation to the baseline, which included reductions from the starting point and the difference between starting point and baseline. The amounts had been calculated using a formula in order to apply a consistent methodology across all countries. The task force had revised annex 5 in the corrigendum to its report based on newly available data, in particular for LVC countries. One representative said that what was lost in the methodology was information about the progress already made by parties towards their reduction targets.

28. Regarding the large difference between the lower and higher estimates of the funding requirements for additional HPMPs, Ms. Rim said that it was essentially due to the difference between the targets that had been used in the calculations, namely 54.5 per cent and 67.5 per cent, respectively.

29. In response to a question about why technical assistance had been included in the higher estimate only, Ms. Rim said that the task force had understood from the consolidated business plan of the Multilateral Fund that the regional project to promote low-global-warming-potential refrigerants for air-conditioning sectors in high-ambient-temperature countries (PRAHA-III) had not been approved only because of the lack of a funding window for such a demonstration project in the triennium 2018–2020. The task force had therefore added it to the higher estimate on the understanding that it could be considered again in the triennium 2021–2023. One representative expressed the hope that the project would receive funding given its potential usefulness for more than 35 countries.

**(b) HCFC production**

30. A total of 7 Article 5 parties produced HCFCs, with the total production reported as some 23,000 ODP tonnes in 2018. The estimates for the HCFC production sector funding requirement took into account: project preparation, which was nil according to the business plan; and the two HCFC

production phase-out management plans (HPPMPs) for China and India in the business plan, including verification. For China, for the lower end of the estimated funding range, the task force had divided the remaining project envelope into 11 equal tranches over the period 2020–2030. For the higher end of the range, the task force had assumed that no funding would be disbursed in 2020 and that same amount had been divided into 10 equal tranches over the period 2021–2030.

31. The overall estimate for HCFC production ranged from \$71,158,000 to \$77,739,000 for the triennium 2021–2023.

32. Responding to comments and questions received, Ms. Maranion acknowledged that it was hard to make an exact prediction about HCFC production as the HCFC production sector subgroup of the Executive Committee had yet to take a decision on stage II of the HPPMP for China. In the absence of further information, the task force had based its estimates on the proposed funding envelope. In response to the suggestion that funding for a potential HPPMP for India should have been included in the higher-end estimate only, owing to the lack of a final decision on eligibility, Ms. Maranion said that it was not for the task force to pass judgement on issues of eligibility and that it would follow the evolution of the related Executive Committee discussions on the topic.

**(c) Indicative figures for a transition to alternatives with low or zero global-warming potential**

33. Ms. Maranion explained that the task force had noted a lack of information on conversion costs making it difficult to develop scenarios and provide indicative figures of the resources that could be associated with enabling Article 5 parties to transition directly to the use of low- or zero-GWP alternatives. As such, it had focused on studying some sample projects that had resulted in a transition towards low- or zero-GWP alternatives in a medium-sized manufacturing country (Egypt); a small manufacturing country (Morocco); and an LVC country (Costa Rica). The cost-effectiveness values that had come to light varied among countries, among sectors and even among manufacturing lines within the same sector.

34. One representative, speaking on behalf of a group of parties, emphasized the need for more in-depth analysis in general of cost-effective options for leapfrogging HFCs when replacing HCFCs with low- and zero-GWP alternatives. Ms. Maranion said that, following the publication of the report, the task force had received additional information about the refrigeration and air-conditioning sector and was of the view that it could construct more comprehensive scenarios to estimate the indicative figures for the resources needed in a potential supplementary report. That could be helpful in providing relevant information to the parties on avoiding a costly two-step transition. One representative confirmed the need for additional information about chillers and large refrigeration distribution systems, including the potential use of hydrofluoroolefins. Another representative proposed that information about production facilities that had been able to convert from HCFCs to cyclopentane be made available so as to share expertise and possibly improve efficiency.

**2. Estimated funding requirement for HFC phase-down**

**(a) Modelling**

35. Recalling the elements of decision XXXI/1 that related to HFC phase-down and parties' obligations in that regard, Ms. Carvalho explained the five-step methodology that the task force had used to calculate the total estimated funding required for HFC phase-down, given that HFC cost guidelines were still under discussion by the Executive Committee and that the HFC baseline would be available only after 2022.

36. The first step was to group countries into brackets according to their baseline HCFC consumption in metric tonnes (MT). One representative sought clarification of why the countries had been grouped according to their HCFC consumption in MT as opposed to carbon dioxide equivalence (CO<sub>2</sub>-eq) or the distribution of consumption in the manufacturing and servicing sectors.

37. The second step was to use the formula specified in the Kigali Amendment to calculate the HFC baseline. The HCFC portion of the HFC baseline was calculated by converting the HCFC baseline of 2009 and 2010 average consumption into GWP in CO<sub>2</sub> equivalent. The data to calculate the HFC portion of the HFC baseline was taken from the 2016 report of the Technology and Economic Assessment Panel and two methods were used to verify the appropriateness of the data. The first verification method used the HCFC baseline and applied a growth rate of 3 per cent from 2009 on the basis of the International Monetary Fund GDP, including the influence of exports of products containing refrigerant. The second method used the fluorocarbon consumption and refrigerant growth rate of 7.8 per cent from the 2017 IHS Markit report. Ms. Carvalho clarified that the IHS Markit report was not detailed enough to enable the task force to break the consumption down into sectors. The

conclusion of the two validations was that the 2016 Technology and Economic Assessment Panel methodology provided a reasonable approximation of the HFC portion of the baseline. In response to a query from several parties, she also said that the task force had not created a baseline estimate that took into account the effects of the COVID-19 pandemic.

38. The third step was for the task force to apply assumptions about HFC usage by market type for each country bracket and sector. These related to the transition from HCFCs to HFCs and other products; HFC consumption in markets where HCFCs were not used; market growth; differentiation between country brackets; differentiation between group 1 Article 5 parties and group 2 Article 5 parties; and 3 per cent growth in all markets each year from 2009. In terms of sector-related HFC-consumption assumptions, it was assumed that HCFC-22 converted to one-third HFCs for commercial refrigeration and two-thirds HFCs for air conditioning. The air-conditioning sector was assumed to convert to 90 per cent R-410A and 10 per cent R-32. The servicing of HCFC-22 replacements was also estimated for each country bracket. It was assumed that HFC-134a consumption in domestic appliances and mobile air conditioning was 2 and 6 per cent of the total HFC baseline, respectively, not a percentage of total consumption as queried by some representatives. The estimate relating to mobile air conditioning included servicing and refrigerant used in the manufacture of new vehicles. In relation to a question about the accuracy of the assumption regarding conversion of HCFC-22 in the air-conditioning sector, given the rapid uptake of R-32 in certain parts of the world, Ms. Walter-Terrinoni said that the task force had chosen to be conservative in its estimates and realized the percentage of R-32 could be higher.

39. In response to requests for further clarification, Ms. Carvalho and Ms. Walter-Terrinoni explained that, using the above assumptions, the total HFC consumption and the associated GWP had been estimated for each sector for each country. The sector totals for all the countries in each bracket had been added together and a weighted average calculated. The average units of CO<sub>2</sub> equivalent for each sector for each bracket had been used to create a percentage of the total CO<sub>2</sub> equivalent units used for that bracket of countries. The assumptions aimed to create an indicative figure of the total transition cost per bracket rather than a precise representation for each country in the bracket. Estimates were, however, available by country on the basis of their HCFC baselines, if needed.

40. The fourth step of the methodology was to apply cost-effectiveness factors to group 1 and group 2 parties. The task force had developed estimates informed by cost-effectiveness factors for HCFCs because there were as yet no HFC guidelines with agreed cost-effectiveness thresholds. A number of representatives expressed concern about or sought further clarification of the use of HCFC cost-effectiveness values. They raised questions about the validity of the conversion between units and its applicability to individual sectors. Ms. Carvalho said that the task force was happy to be given more guidance with a view to improving the modelling.

41. The final step was the calculation of the results. Table 3-6 of the report provided indicative figures not for the triennium 2021–2023, but of the total cost of HFC phase-down for all countries for the consumption sector by 80 per cent for group 1 parties and by 85 per cent for group 2 parties. That included deductions for exports, foreign/multinational ownership of enterprises, cut-off dates and adjusted servicing sector costs for the LVC countries in bracket E, as detailed in annex 8 to the report. Ms. Carvalho clarified that the figures in the last column of table 3-6, in \$/MT of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>-eq), were not cost-effectiveness values or cumulative benefit costs, but were a calculation of the average cost per MTCO<sub>2</sub>-eq of the amount phased down in that bracket and group.

42. In response to comments on table 3-6 and the custom of measuring phase-out in MT and the environmental effect in MTCO<sub>2</sub>-eq, Ms. Carvalho said that the task force had not had readily available figures relating to metric tonnage, but she proposed that the task force make estimates in a potential supplementary report. She stressed that they would indeed be estimates only, as the quantities included the HCFC portion of the baseline were not actual HFCs. The CO<sub>2</sub>-eq amount was based on the conversion of the HCFCs into GWP values.

43. In response to questions about the overall total in table 3-6 of 1,217 million MTCO<sub>2</sub>-eq of HFC to be phased down in relation to the baseline figures in table 3-2, Ms. Carvalho and Ms. Rim explained that the task force had taken the group 1 proportion (1,014 million MTCO<sub>2</sub>-eq) of the total 2020–2022 HFC baseline (1,161 million MTCO<sub>2</sub>-eq) and had added to it 65 per cent (461 million MTCO<sub>2</sub>-eq) of the group 1 proportion (709 million MTCO<sub>2</sub>-eq) of the HCFC portion of the baseline (812 million MTCO<sub>2</sub>), as converted into CO<sub>2</sub> equivalent. The total baseline for group 1 Article 5 parties thus amounted to 1,476 million MTCO<sub>2</sub>-eq. As the group 1 parties were to phase down by 80 per cent, the task force had taken 80 per cent of the baseline, deducting 15 per cent for ineligible consumption from the bracket A, B and C countries. The final amount came to 1,018 million

MTCO<sub>2</sub>-eq. The task force had conducted the same exercise for group 2 Article 5 parties, reaching 199 million MTCO<sub>2</sub>-eq. The overall total was thus 1,217 million MTCO<sub>2</sub>-eq as per table 3-6.

44. Answering a number of requests for clarification regarding the figures for estimated Kigali HFC phase-down management plans (KPMs), Ms. Carvalho said that the task force had based its calculations on a 10 per cent reduction in HFC consumption. For group 1, with its deadline of 2029, that 10 per cent had been divided evenly over the years 2021 to 2028, amounting to a reduction of 1.25 per cent per year and thus 3.75 per cent in the triennium 2021–2023. For group 2, the 10 per cent reduction was to occur by 2032, so the 10 per cent had been divided evenly over the years 2024 to 2031, also equalling 1.25 per year, but without incidence for the triennium 2021–2023. Ms. Carvalho said that the task force was open to suggestions for alternate methods, if parties so wished. One representative questioned the validity of calculating HFC reductions in years prior to the setting of the baseline.

45. She also queried the need for support or funding during the triennium 2021–2023 to help Article 5 parties to meet the future HFC freeze and 10 per cent reduction target, given how generous the baseline would be, boosted by HCFC portion. Ms. Marañon said that the task force considered that some funding would be needed during the triennium for activities to develop the baseline and work towards the freeze.

46. Another representative, while noting that HFC phase-down in non-Article 5 parties was not of direct relevance to the replenishment process, asked for the figures relating to the components of the baselines for those parties.

**(b) Ratification scenarios of the Kigali Amendment**

47. Recalling that, in its decision XXXI/1, the Thirty-First Meeting of the Parties had asked the Technology and Economic Assessment Panel to develop three scenarios representing different potential levels of ratification of the Kigali Amendment when estimating the funding requirement for the phase-down of HFCs, Ms. Carvalho explained that the task force had considered a business-as-usual scenario, based on the consolidated business plan of the Multilateral Fund and the task force's consumption and production sector estimates, and three other scenarios. The first additional scenario involved only countries that had ratified the Kigali Amendment; the second involved countries that had ratified the Kigali Amendment or submitted a letter of intent to do so; and the third involved all countries, implying that all 144 Article 5 parties would have ratified the Kigali Amendment by 2023.

48. In response to questions regarding the small difference between the second and third additional scenarios in terms of the number of countries and the estimates of final costs, Ms. Carvalho said that the single largest consuming Article 5 country (China, in bracket A) was included in both scenarios. She welcomed guidance from the parties if they wanted to define other scenarios.

**(c) Ratification assistance**

49. Recalling that countries that had ratified the Kigali Amendment or provided letters to the Multilateral Fund Secretariat indicating their intention to do so had been eligible to receive funds for enabling activities in the triennium 2018–2020, the task force had provided indicative figures of the funding required to assist the parties that had not yet applied for funds, should they wish to do so in the triennium 2021–2023. Ms. Carvalho noted that an additional request by an LVC country submitted to the Executive Committee for consideration at its eighty-fifth meeting had not been taken into consideration in the report.

50. Regarding the special situation of very-low-volume-consuming (VLVC) countries, following informal consultations with such countries, as set out in annex 2 to the report and on the basis of Executive Committee decision 79/46, the task force had estimated the total amount required for a one-time supplementary funding to 21 VLVC countries at the level of \$50,000 (plus support costs) to be \$1.01 million to enable stakeholder consultations in the preparation of national strategies.

**(d) HFC-related stand-alone projects**

51. In decision XXXI/1, the Thirty-First Meeting of the Parties had requested the task force to provide the cost of supporting a limited number of stand-alone projects to transition out of HFCs, in accordance with paragraph 4 of decision XXX/5. The task force had estimated that \$14 million would be needed for a limited number of stand-alone projects to be considered for under-represented regions and sectors, prioritizing the stationary air-conditioning, commercial refrigeration and mobile air-conditioning sectors in accordance with Executive Committee decision 84/53. The estimate was

based on the funding levels of stand-alone projects approved in the triennium 2018–2020. During informal consultations with parties, the task force had been advised that a limited number of projects meant up to 10 projects. Ms. Carvalho clarified that the \$14 million had been deducted from the funds calculated for KPMPs to avoid double counting. One representative proposed that the task force provide a range of possible funding levels, with \$14 million as the upper limit.

**(e) Opportunities for early activities addressing the high growth rate of HFCs**

52. In considering early activities in the servicing/end-user sector in order to comply with the Kigali Amendment by addressing the high growth rate in HFC consumption, in accordance with decision XXXI/1, the task force had looked at funding precedents by the Executive Committee. It estimated that between \$0 and \$50 million would be needed to accelerate project submission in sectors with a high growth rate in the use of high-GWP HFCs in manufacturing conversion. Ms. Carvalho clarified that that funding would be in addition to the requirement for KPMP preparation and implementation presented in the model. She proposed that the funding for such projects could be brought forward from future trienniums and deducted from the eligible consumption to be agreed upon in the future. In addition, there was a potential funding window of \$0 to \$15 million for activities to foster market transformation to low-GWP products at the end-user stage.

53. Several representatives, including one speaking on behalf of a group of parties, noted the importance of focusing on funding for compliance-related activities. One mentioned specifically the buyers' clubs and market transformation programmes and queried their inclusion in the funding estimates. Ms. Carvalho said that the task force had noted that there were many situations in which policy, conversion and consumer programmes needed to be run in conjunction to transform the market for the use of low-GWP and energy-efficient products. It was also important to draw on the lessons learned from those experiences when considering such interventions in the future.

54. One representative requested more information about the methodology for and the assumptions used in the calculations, while another representative requested alternative scenarios that illustrated the possible impact and benefits of an accelerated transition to low- or zero-GWP alternatives under the HPMP, thus fostering an early sustained reduction of demand for HFCs. Another representative said that the potential challenges to the phase-down of HFCs were more complicated than those experienced in the phase-out of HCFCs, requiring the allocation of sufficient funding. He highlighted historical delays in implementation in the phase-out of chlorofluorocarbons (CFCs) in the chiller sector, which he attributed to a low level of funding.

55. One representative noted that energy efficiency was discussed extensively in the report by the task force, but that there appeared to be no specific funding provision for this critical element. Another representative recalled, however, that energy efficiency was not an eligible incremental cost under the Multilateral Fund.

**(f) Cost effectiveness factors and the special needs of LVC and VLVC countries in bracket E**

56. Ms. Carvalho said that, during the implementation of their HPMPs, the countries in bracket E, where consumption was based only on refrigerant servicing, had learned some specific lessons, namely that there was insufficient financing for most projects; implementation often created problems that had then to be addressed in subsequent stages; and capacity-building needed to be repeated and reinforced. They experienced challenges relating to new technology, safety and energy efficiency; policy- and market-related actions, including end-user incentive programmes and coordination on minimum energy performance standards; training, awareness-raising and educational programmes to create a sustainable sales force; disposal/destruction strategies; and sectors that had converted from CFCs to HFCs and were not included in the HPMP. One representative, speaking on behalf of a group of parties, expressed appreciation for the documentation of some of the challenges facing Article 5 parties and implementing agencies and requested more information in that regard.

57. To resolve some of the issues faced, the task force was proposing to work on the chain for the proper supply and use of tools and equipment delivered under the investment projects; reinforce the project management units to ensure that projects were implemented effectively and on time; strengthen reporting and verification schemes; and develop sustainable training and technician certification schemes. The task force had concluded that funding for HFC phase-down would need to increase as support for HCFC phase-out declined so that LVCs would be able to develop and maintain best practices in all areas. An estimated \$57.5 million would be required for the triennium 2021–2023 to support the activities shown in annex 8 to the report.

58. In response to comments about the “maintain and build” concept, Ms. Carvalho and Mr. Elassaad said that it was not a new policy, but rather a description of the activities that the task

force considered to be necessary to enable LVC countries to maintain stable infrastructure funding. One representative expressed concern about the nature of the projects proposed by the task force in table 3-7, which were not typical projects funded by the Multilateral Fund and did not always focus directly on compliance with control measures. Furthermore, they might imply collaboration among multiple ministries or also necessitate funding from other sources. Another representative expressed the view, however, that \$57.5 million should be the minimum allocation. A third representative expressed support for the concept of centres of excellence and the tailoring of support to the subregional level.

59. Responding to a question about the dumping of used products and equipment using old technologies in Article 5 parties, Ms. Carvalho said that the issue was usually tackled in end-user activities, but it could be that a strengthening of legislation and law enforcement would be required too.

**(g) Summary of the estimated funding requirement for the HFC consumption sector**

60. In summary, the estimated funding requirement for the phase-down of HFCs in the consumption sector for the triennium 2021–2023 ranged from \$9 million to \$293 million, taking into account approved projects or KPMPs (of which there were currently none in any scenario); project preparation costs; planned KPMPs in the consolidated business plan for the period 2020–2022; task-force-estimated KPMPs; stand-alone projects; ratification assistance; verification (which was also zero as there were as yet no approved KPMPs); and early activities addressing the high growth rate of HFCs.

61. Several representatives, including one speaking on behalf of a group of parties, made comments and posed questions about the limited utility of the consolidated business plan for the period 2020–2022 for estimating the funding needed for planned KPMPs in the triennium 2021–2023. One representative, speaking on behalf of a group of parties, said that the HFC funding scenarios did not sufficiently take into account the time needed from ratification of the Kigali Amendment, through project preparation, to submission of the KPMP. The entire process could take several years. She also said that the business-as-usual scenario in table 3-10 should be a mid-cost scenario as there could be a lower-cost one that took into account savings from negotiations and unused funds due to project delays. She stressed the importance of using resources wisely on the basis of a thorough analysis of real funding needs. Another representative said, however, that it was her view that the business-as-usual estimate was too low and that the other scenarios were more accurate.

62. Responding to the comment on a potential lower amount, Ms. Rim said that the task force had not gathered information on the average length of tranche submission delays under approved HPMPs and average reductions in the cost of projects and tranches between submission and their final approval. Another representative commented on the unrealistic nature of the project implementation estimates in the report, stating the average time taken was much greater.

63. Ms. Carvalho said that on the basis of experience of HCFC phase-out, the first few phase-out projects were often more like demonstration projects with higher cost-effectiveness values, but they did not seem to have a major impact on the overall funding requirements. The KPMPs in the business plan amounted to about \$7.3 million, which was not a high proportion of any of the scenarios. The task force was open to reconsidering that element if the parties so wished.

64. One representative requested further information about the difference between the amounts estimated for KPMPs and for activities undertaken to avoid growth in the use of HFCs. In the case of HCFC phase-out, he said that early investment projects had been approved a couple of years before the plans themselves, whereas for HFCs, the parties might be considering early activities and KPMPs concurrently, possibly for the same countries.

**3. HFC production sector and HFC-23 by-product emission mitigation**

65. Ms. Carvalho and Ms. Zhang recalled that there were six parties that produced HCFC-22 and HFC-23 by-product. Given that there were no related guidelines, and that only three of the six parties had ratified the Kigali Amendment, the task force had presented a wide range of possible funding requirements relating to HFC production and HFC-23 by-product mitigation. These included costs related to project preparation.

66. In terms of project preparation, although the consolidated business plan did not contain estimates of the costs relating to the HFC production sector, the task force had estimated a funding requirement of between \$0 and \$2 million for the conduct of production sector audits in a few countries. Project preparation relating to HFC-23 by-product mitigation was estimated to require up to

\$0.2 million. In response to a question, Ms. Zhang said that the task force had considered HFC-23 by-product mitigation preparation costs for the Democratic People's Republic of Korea because it was a party to the Kigali Amendment; it had not taken into account the resolutions of the United Nations Security Council and the feasibility of implementing the activities in the country.

67. In terms of the investment and operational costs of HFC-23 by-product mitigation, Ms. Zhang clarified that, constrained by available information, the task force had based its estimation on proposals submitted by Argentina and Mexico to the Executive Committee at its eighty-fourth meeting and on the assessment by the Multilateral Fund Secretariat of the proposal by Mexico, which was due for consideration by the Executive Committee at its eighty-fifth meeting. The task force had divided the costs into eight equal annual tranches from 2021 to 2029, estimating a cost range from \$6.4 million to \$26.1 million, and had then used the figures pertaining to the triennium 2021–2023. In response to a query about why the task force had not used information from the most recent Executive Committee document relating to the project in Argentina (UNEP/OzL.Pro/ExCom/85/65), to estimate the cost of plant closure, Ms. Zhang said that only the initial project proposal had been available to the task force at the time of the preparation of the report. As the discussions on Argentina and Mexico would continue at the eighty-fifth meeting of the Executive Committee, the task force would update its estimation on the basis of any new decisions or information that became available. As China and India had yet to ratify the Kigali Amendment and had made their own commitments to control HFC-23 by-product emissions, the cost of their HFC-23 by-product mitigation had not been included in the report.

68. Ms. Zhang also clarified that the task force had considered funding for sustained reductions only. She said that, in the discussions on the HFC-23 by-product mitigation, there were still many important policy issues to be resolved, including the sustainability of funding for HFC-23 by-product mitigation and other relevant effects of policies and best practice examples that might not only lower the emissions but also provide economic benefits.

69. Making a factual correction to the report, she said that, according to document UNEP/OzL.Pro/ExCom/84/74, in 2018 a total of 99.8 per cent 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 per cent had been vented. One representative said that she too had submitted written corrections to the information on HCFC-22 production lines and relevant data on incineration of HFC-23 in her country and hoped that the corrections could be made in a future iteration of the report.

70. Several representatives expressed regret at the lack of consideration of destruction and disposal projects, both of unwanted substances and of equipment containing them, in the triennium 2021–2023, and the deferral thereof to a future triennium. One representative proposed that the replenishment allow for some kind of activity in the triennium 2021–2023, be it only a desk study. Another representative suggested that, as HCFC investment activities declined, the level of funding should be maintained and used for HFC phase-down and disposal. Ms. Rim said that the issue of disposal could be discussed further if the parties so wished.

#### **4. Funding requirements for institutional strengthening and standard activities for the 2021–2023 replenishment period**

##### **(a) Institutional strengthening**

71. Ms. Carvalho and Ms. Zhang said that the task force had looked at two scenarios for institutional strengthening in the funding estimates. The first was a business-as-usual scenario based on the approved levels of funding in the consolidated business plan for the period 2020–2022. They explained that institutional strengthening typically followed a pattern of funding that recurred every two years, meaning that the estimates for 2021 and 2023 were the same and the estimate for 2022 was based on 2020. The second scenario considered projections for the triennium 2021–2023 based on a 28 per cent increase on the first scenario.

72. The task force had also presented two more hypothetical scenarios giving indicative figures, but they had not been included in the final funding estimate. The first additional scenario was based on a 50 per cent increase on the business-as-usual scenario, in reaction to feedback from country interviews and the additional workload in countries due to parallel implementation of tasks related to the Kigali Amendment and ongoing HCFC phase-out activities. Several representatives confirmed the increased workload for national ozone units. The second additional scenario was a 100 per cent increase on the business-as-usual scenario for the same reasons.

73. Several representatives said that the hypothetical scenarios should be included as real alternatives in the calculations, with some of them favouring a substantial increase in support. Ms. Carvalho pointed out that funding for the strengthening of national ozone units in LVC countries was included in the estimates that aimed to meet the special needs of countries in bracket E, in annex 8.

74. In response to a question about delays to approval of renewal of institutional strengthening, Ms. Carvalho said that the task force was unable to comment on matters specific to the internal workings of the Executive Committee.

**(b) Standard activities**

75. Ms. Carvalho and Ms. Zhang said that standard activities were those related to the costs of the UNEP Compliance Assistance Programme, the core unit costs of UNDP, UNIDO and the World Bank, the operation of the Multilateral Fund Secretariat and the services of the treasurer. The task force had used the funding levels in the consolidated business plan for the years 2021 and 2022, and the estimate for 2023 was based on the normal United Nations incremental increase according to the trend in the business plan. Ms. Zhang clarified that there was no absolute increase in the Multilateral Fund Secretariat costs, just an incremental increase per year for each activity. The total funding requirement for standard activities stood at approximately \$80 million.

76. One representative proposed that there be an increase for the Compliance Assistance Programme as it faced challenges in assisting Article 5 parties with their HCFC and HFC compliance obligations. Another representative, speaking on behalf of a group of parties, asked for more information on how the task force had ensured that there was no overlap between activities under HPMPs and KPMPs, for LVC/VLVC countries and under the Compliance Assistance Programme.

**5. Total funding requirement for the triennium 2021–2023**

77. The total funding requirement for the triennium 2021–2023, covering the cost for HCFC- and HFC-related activities, institutional strengthening and standard activities, was estimated to be between \$377 million and \$809 million.

78. In general comments, one representative said that provision should be made to strengthen the Montreal Protocol by increasing monitoring to forestall situations similar to the unexpected increase in emissions of CFC-11. Another representative, speaking on behalf of a group of parties, was concerned that the cost calculations were not sufficiently linked to the expected impact and the environmental benefit and whether the impact could be sustained. She stressed the importance of transparent analysis, proposing that the information in the report could be usefully divided into what was required for compliance, what related to extended commitments and what were additional accompanying options.

**6. Indicative funding requirements for the trienniums 2024–2026 and 2027–2029**

79. In order to estimate the funding requirement for future trienniums, the task force had based its calculations on the continuation of HCFC phase-out activities, following the same methodology as for the triennium 2021–2023. For HFC activities, it had used the same methodology as for the triennium 2021–2023 and had also taken into account the third additional ratification scenario in which all countries had ratified the Kigali Amendment, by 2023 and by 2025. The calculations also included estimates for institutional strengthening and standard activities using the same methodology as for the upper range in the triennium 2021–2023.

**IV. Closure of the meeting**

80. Following the customary exchange of courtesies, the three technical sessions of the online meeting of the forty-second meeting of the Open-ended Working Group of the Parties to the Montreal Protocol were declared closed at 9.30 p.m. (Nairobi time (UTC +2)) on Tuesday, 14 July 2020; at 3.30 p.m. (Nairobi time (UTC +2)) on Wednesday, 15 July 2020; and at 11.05 a.m. (Nairobi time (UTC +2)); on Thursday, 16 July 2020.