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Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer
Thirty-eighth meeting
Vienna, 18–21 July 2016

Report of the thirty-eighth meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer

I. Opening of the meeting

1. The thirty-eighth meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer was held at the Vienna International Centre, Vienna, from 18 to 21 July 2016. The meeting was co-chaired by Mr. Paul Krajnik (Austria) and Mr. Leslie Smith (Grenada).

2. The meeting was opened at 10.10 a.m. on Monday, 18 July 2016, by Mr. Smith.

3. Ms. Tina Birmpili, Executive Secretary of the Ozone Secretariat, made an opening statement in which she expressed appreciation to all parties for the flexibility, leadership and spirit of compromise that they had exhibited during the resumed thirty-seventh meeting of the Open-ended Working Group, at which they had achieved a positive outcome with solutions to challenges identified under the Dubai pathway on hydrofluorocarbons (HFCs). She invited representatives to continue working in the same spirit at the current meeting as they considered the four amendment proposals on HFCs in preparation for the Third Extraordinary Meeting of the Parties.

4. Recalling two great successes of the Montreal Protocol – the near phase-out of methyl bromide, which not long before had been widely used in agriculture, commodities and structures, and the phase-out of chlorofluorocarbons (CFCs) in metered-dose inhalers – she invited the parties to consider the experience gained in achieving those successes as they discussed how to manage HFCs under the Protocol. Methyl bromide and CFCs had been phased out without certainty that alternatives for all uses would be available, so the parties had agreed to exemptions for certain uses in order to regulate the market and protect the needs of individual countries. Based on that experience, the parties were addressing possible exemptions early on in the discussions on how to manage HFCs under the Protocol, and at their request the Technology and Economic Assessment Panel had produced considerable work on alternatives.

5. She turned next to the study on the funding required for the 2018–2020 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol. Given the current discussions on phasing down high-global-warming-potential (GWP) HFCs in certain sectors, she suggested that the parties might want to define terms of reference for the replenishment study broader than those used for the previous study.

6. In closing, she urged the parties to focus on their common commitment to deliver on the Dubai pathway on HFCs and thereby further strengthen the Montreal Protocol, to seize the momentum generated by the successful resumed thirty-seventh meeting of the Open-ended Working Group and,

guided by the principle of precaution that underlay the treaty, to pool their individual powers for the sake of the global environment, the people of the world, the ozone layer and the climate.

II. Organizational matters

A. Attendance

7. The thirty-eighth meeting of the Open-ended Working Group was attended by representatives of the following parties: Afghanistan, Albania, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Belarus, Belgium, Belize, Benin, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Canada, Chad, Chile, China, Colombia, Comoros, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, Czechia, Democratic People's Republic of Korea, Democratic Republic of the Congo, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Eritrea, Estonia, Ethiopia, European Union, Fiji, Finland, France, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guyana, Haiti, Holy See, Honduras, Hungary, India, Indonesia, Iran (Islamic Republic of), Ireland, Italy, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Lebanon, Lesotho, Libya, Lithuania, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia (Federated States of), Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Russian Federation, Rwanda, Saint Vincent and the Grenadines, Samoa, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Somalia, South Africa, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Thailand, the former Yugoslav Republic of Macedonia, Timor-Leste, Togo, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Uruguay, Venezuela (Bolivarian Republic of), Viet Nam and Zimbabwe.

8. Representatives of the following United Nations bodies and specialized agencies also attended: International Maritime Organization, secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol, secretariat of the United Nations Framework Convention on Climate Change, Secretariat of the United Nations, United Nations Development Programme, United Nations Environment Programme, United Nations Industrial Development Organization and World Bank.

9. The following intergovernmental, non-governmental, industry, academic and other bodies and individuals were also represented or present: ADC3R, Air-conditioning, Heating and Refrigeration Institute, Alliance for Responsible Atmospheric Policy, Arkema, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Bitzer SE, California Citrus Quality Council, Center for Climate and Energy Solutions, Centre for Science and Environment, the Chemours Company, China Association of Fluorine and Silicone Material Industry, China Household Electrical Appliances Association, China National Petroleum and Chemical Planning Institute, Christian Aid, Climate Action Network International, Climalife, Climate Advisers, Climate and Clean Air Coalition, Council on Energy, Environment and Water, CYDSA Corporativo, S.A. de C.V., Daikin Europe N.V., Daikin Industries, Ltd., Daikin U.S. Corporation, Danfoss A/S (Denmark), Dongyang Chemical Co. Ltd., Embraco Europe S.r.l., Emergent Ventures India, Environmental Investigation Agency, European Air-conditioning and Refrigeration Association, European Chemical Industry Council, European Partnership for Energy and the Environment, GIZ GmbH, GIZ Proklima, Gluckman Consulting, Gujarat Fluorochemicals Limited, HEAT International, Honeywell, Hudson Technologies, ICF International, IN Consult (Pvt.) Ltd., India Habitat Centre, Ingersoll Rand Inc., Institute for Governance and Sustainable Development, International Institute of Refrigeration, International Pharmaceutical Aerosol Consortium, Institute of Energy and Environment, Japan Fluorocarbon Manufacturers Association, Japan Refrigeration and Air-Conditioning Industry Association, Jiangsu Blue Star Co., Ltd., Johnson Controls, Kulthorn Group, Lawrence Berkeley National Laboratory, League of Arab States, Lennox International Inc., Mahle Behr Troy Inc., Mebrom, Matthias Meier Technical Consulting, Mexichem (UK) Limited, Mitsubishi Electric Europe B.V., Natural Resources Defense Council, Nolan Sherry and Associates Ltd., Northwest Horticultural Council, Oak Ridge National Laboratory, Oeko-Recherche GmbH, Pyc Edition, Quimobásicos S.A. de C.V., Refrigeration and Air-Conditioning Manufacturers Association of India, Refrigerants Australia, Shecco, Sinochem Lantian Co., Ltd., SRF Limited, Sun Yat Sen University School of Engineering, Tata Motors Limited, TERRE Policy Centre, TICA Air-conditioning, Transfrig, Trans-Mond Environment Ltd., United Technologies Corporation, Victorian Strawberry Industry Certification Authority, Westfalen France S.a.r.l, Xi'an Jiaotong University, Zhejiang Sanmei Chemical Industry Co., Ltd., Zhejiang Yonghe Refrigerant Co. Ltd. and independent consultants.

B. Adoption of the agenda

10. The Working Group adopted the following agenda on the basis of the provisional agenda set out in document UNEP/OzL.Pro.WG.1/38/1:

1. Opening of the meeting.
2. Organizational matters:
   (a) Adoption of the agenda;
   (b) Organization of work.
3. Report by the Technology and Economic Assessment Panel on updated and new information on alternatives to ozone-depleting substances (decision XXVII/4).
4. Dubai pathway on hydrofluorocarbons (HFCs) (decision XXVII/1).
5. Technology and Economic Assessment Panel 2016 report.
6. Issues related to exemptions under Articles 2A–2I of the Montreal Protocol:
   (a) Nominations for essential-use exemptions for 2017;
   (b) Nominations for critical-use exemptions for 2017 and 2018.
7. Issues related to the phase-out of hydrochlorofluorocarbons (decision XXVII/5).
8. Availability of recovered, recycled or reclaimed halons (decision XXVI/7).
9. Terms of reference for the study on the 2018–2020 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol.
10. Report by the Technology and Economic Assessment Panel and the Scientific Assessment Panel on analysis of the discrepancies between observed atmospheric concentrations and reported data on carbon tetrachloride (decision XXVII/7).
11. Destruction of banks of ozone-depleting substances (UNEP/OzL.Pro.27/13, para. 114).
12. Technology and Economic Assessment Panel: organizational matters.
13. Other matters.
14. Adoption of the report.
15. Closure of the meeting.

11. The representative of China announced that his Government would submit a conference room paper setting out a proposal for the establishment of an ad hoc coordination group on safety criteria or standards applicable to alternatives to HFCs. The Working Group agreed that it would consider the proposal under item 13, “other matters”.

C. Organization of work

12. The Working Group adopted a proposal on the organization of work presented by the Co-Chair, agreeing to establish contact and informal groups and to hold night sessions as necessary to finalize its work; to avoid holding contact group meetings in parallel with each other or with plenary meetings; and to avoid, to the extent possible, the holding of simultaneous informal group meetings.

13. During discussion of the proposal, representatives raised several issues that they said should be taken into account in the organization of the current meeting. It was said that parallel sessions of various groups should be avoided; that time should be allocated for regional consultations; that evening sessions should be avoided or, if that proved impracticable, limited in length and not allowed to run late into the night; that contact group co-chairs should allow time for breaks; that contact groups be given firm deadlines for the completion of their work; and that all meeting rooms should be sufficiently spacious and comfortable. The Co-Chair said that the Secretariat and the Co-Chairs had taken note of the concerns expressed and would do their best to address them.

III. Report by the Technology and Economic Assessment Panel on updated and new information on alternatives to ozone-depleting substances (decision XXVII/4)

14. Introducing item 3 of the agenda, the Co-Chair of the Open-ended Working Group recalled that in decision XXVII/4 the Meeting of the Parties had requested the Technology and Economic Assessment Panel to prepare a report for consideration by the Open-ended Working Group and an updated version of that report for consideration by the Twenty-Eighth Meeting of the Parties. The task force established by the Panel to prepare the report had presented an initial draft of the report to the Open-ended Working Group at its thirty-seventh meeting and had subsequently revised and updated it in the light of the comments received and the guidance issued by the Working Group at that meeting. The updated version of the report was before the Working Group at the current meeting. On behalf of the Working Group, he expressed appreciation for the hard work of the task force in producing the report subject to considerable time constraints. He also drew attention to the executive summary of the current version of the report (OzL.Pro.WG.1/38/2/Add.1).

15. Ms. Bella Maranion, Mr. Roberto Peixoto and Mr. Lambert Kuijpers, co-chairs of the task force, gave a presentation on the current version of the report, which provided updated information on the use of alternatives in the refrigeration and air-conditioning sector based on informal discussions at the thirty-seventh meeting of the Open-ended Working Group, information in response to other parts of decision XXVII/4 not addressed in the first draft, including information on alternatives to refrigeration systems on fishing vessels and updated information on the use of alternatives in high ambient temperatures, and further development of the mitigation scenarios.

16. A summary of the presentation, prepared by the presenters, is set out in annex I to the present report.

17. In the discussion following the presentation, all of the representatives who spoke thanked the Panel and task force for their work in preparing what they described as an extremely valuable report in the short time available. A number of representatives posed questions regarding matters highlighted during the presentation or discussed in the report.

18. Responding to questions on testing programmes for alternatives in high ambient temperatures, Mr. Peixoto explained that it was difficult to compare the results from different programmes because the tests had been conducted on different types of equipment under different conditions using different testing protocols; no standard protocol had yet been developed. In general, the alternatives had been compared against either HCFC-22 or R-410A because those two substances were in widespread use but possessed different characteristics. He added, however, that it was hoped that in the near future testing would be developed that would permit broader comparisons to be drawn. He said that more information on the time frames of the testing programmes would be included in the next version of the report.

19. Responding to a question on the future commercial availability of new refrigerants, he said that it depended on several factors. While the task force could monitor the current situation in the market, it was impossible to foresee future developments.

20. Responding to questions on the cost of alternatives for use on fishing vessels, Mr. Peixoto and Mr. Fabio Polonara, co-chair of the Refrigeration, Air-Conditioning and Heat Pumps Technical Options Committee, explained that the different pressures and toxicities of alternative refrigerants such as carbon dioxide and ammonia required investment in new or modified equipment. In addition, while the cost of the refrigerants themselves was low, other factors, such as the need for additional safety measures, system adjustments to ensure optimum efficiency, and the training of technicians unfamiliar with the substances, had all contributed to the task force's decision to rate the operational cost as "medium" rather than "low". Given the pace of development, however, he expected that such costs would change in the future, and the task force would continue to monitor the situation.

21. Thanking another representative who had indicated the intention to provide updated information on the retrofitting of refrigeration systems on fishing vessels, Mr. Peixoto said that the next version of the report would contain relevant updated information, as well as further information on short-term retrofitting options.

22. Responding to a question on the safety of ammonia in refrigeration systems, he said that options for minimizing refrigerant charge were currently being explored and that new systems should require much lower charges than older ones.

23. In response to data provided by one representative suggesting that total global HFC production capacity and consumption were both higher than the figures included in the report of the task force, Mr. Kuijpers recalled that the report included figures on the use of HFCs only in the refrigeration and air-conditioning sector, not on HFC use in other sectors. In addition, while parties not operating under paragraph 1 of Article 5 of the Montreal Protocol (non-Article 5 parties) reported data on HFCs under the United Nations Framework Convention on Climate Change, Article 5 parties had no such obligation, and it was difficult to be precise about production and consumption data for those countries. The task force would welcome any further information that parties could provide and would aim to improve the data included in the next version of the report.

24. In response to a request for the report to include figures for emissions of HFCs as a proportion of total greenhouse gas emissions, Mr. Kuijpers pointed out that the task force report contained data on consumption, not on emissions, which depended on a wide range of factors. The task force would consider what additional clarifying information it could provide in the next version of the report.

25. Responding to a request for information on the price of alternatives, and a specific question on the cost of using carbon dioxide in supermarkets, he said that it was impossible to provide accurate information because prices varied too much with the use of the substances and the situation was evolving very rapidly. The task force, furthermore, considered patents to be important but could not go into information on the expiry dates for the various intellectual property rights applicable to the alternatives, since that concerned new chemicals and the specific application patents for them. He also explained that in calculating the global warming potential of blends of HFCs, an average figure for the blends had been used, independent of the components of those blends. He confirmed that some of those components had high global warming potentials.

26. In response to a question on the reasons behind the projected growth in HFC consumption in the task force's mitigation scenarios, he said that it was mainly due to the projections for economic growth included in the model that had been used by the task force. He expressed agreement with one representative's request to consider the impact of all sectors in the scenarios in future iterations, and he said that the task force would review whether it would be possible to include in the scenarios for non-Article 5 parties the impact of the phasedown of HFC consumption that would follow the implementation of the European Union's F-Gas regulation.

27. In response to another question, he said that the energy efficiency of the alternatives had not been taken into account in the scenarios because it was not related to the scenarios, which only considered demand and related amounts of refrigerant. Energy efficiency depended heavily on the type of equipment in use, ambient temperature and several other factors. While it was impossible to derive a single figure for the energy efficiency of a given substance, the task force would aim to provide more background information in the next version of the report.

28. He agreed with one representative's observation that the consumption of HFCs in the servicing sector – the only use of such substances in most Article 5 parties – would become more important in the future, as it was projected to account for the majority of HFC use by 2030. Further investigation of ways to consider sub-scenarios for those future servicing needs would be considered by the task force.

29. One representative queried the conclusions of the report regarding progress with the revision of safety standards, which he suggested were too optimistic, as well as the report's conclusion that district cooling systems could only be installed in new building developments but not retrofitted. Mr. Kuijpers said that the task force would look again at both issues and would attempt to further assess the safety issues raised by different alternatives.

30. One representative suggested that it would be helpful if the Panel could develop its mitigation scenarios further to reflect the proposals for the phasedown schedules for the consumption and production of HFCs set out in the proposals to amend the Montreal Protocol in respect of HFCs, which she said would enable the parties to appreciate the climate benefits of the proposals and their potential cost to the Multilateral Fund. She said that her delegation intended to submit a conference room paper on the subject.

31. The Co-Chair suggested that any other representatives with questions or suggested further guidance for the Panel could discuss them bilaterally in the margins of the meeting.

32. At a subsequent session Ms. Maranion reported that there had been no further discussion of the matter at the current meeting. The Technology and Economic Assessment Panel, she said, would accordingly review the current version of the report in the light of the comments and suggestions made in plenary and submit a further updated version for the Twenty-Eighth Meeting of the Parties.

IV. Dubai pathway on hydrofluorocarbons (HFCs) (decision XXVII/1)

33. Introducing item 4 of the agenda, the Co-Chair of the Open-ended Working Group recalled that the Working Group at its resumed thirty-seventh meeting had agreed on solutions to the challenges identified in the Dubai pathway, which had been captured in an outcome document prepared for the current meeting (document UNEP/OzL.Pro.WG.1/38/7 and Corr.1). The Working Group decided that the contact group on the feasibility and ways of managing HFCs that had been established at the Twenty-Seventh Meeting of the Parties and continued during the thirty-seventh and resumed thirty-seventh meetings of the Open-ended Working Group, co-chaired by Mr. Patrick McInerney (Australia) and Mr. Xia Yingxian (China), would continue to work on the proposals to amend the Montreal Protocol in respect of HFCs. Those elements of solutions to the challenges that it had generated would be taken up during the amendment negotiations and resolved prior to the adoption of any amendment.

34. The Co-Chair subsequently announced that two conference room papers had been submitted, by India and Pakistan, each setting out draft decision text for consideration by the Working Group for inclusion in decisions by the Meeting of the Parties under the Dubai pathway on HFCs. A third conference room paper had also been submitted, by Canada and the United States of America, setting out a draft decision providing for the Technology and Economic Assessment Panel to produce a report on the climate benefits and costs of reducing HFCs under each of the proposed amendments. It was agreed that all three conference room papers should be discussed by the contact group on HFCs.

35. Subsequently, at the final session of the current meeting, on the afternoon of Thursday, 21 July, the co-chair of the contact group reported that the members of the group had actively discussed issues relating to the proposed amendments to the Protocol in respect of HFCs, including the calculation of baselines, the year in which any freeze should commence and reduction steps, including the estimation of amounts and timing of the peak year for production and consumption, for both Article 5 and non-Article 5 parties. The contact group had not reached agreement on any issue, however, and it accordingly recommended that its work continue to enable further informal discussion on those issues in the margins of the Third Extraordinary Meeting of the Parties.

36. The Open-ended Working Group accordingly decided to suspend its thirty-eighth meeting to allow the contact group, including through informal consultations, to continue to discuss the issues outlined above in the margins of the Third Extraordinary Meeting of the Parties and to report on the outcome of its discussions to the Third Extraordinary Meeting of the Parties in plenary. The contact group would also further consider the three conference room papers referred to above, along with a fourth conference room paper, submitted by Pakistan, proposing draft decision text for draft decisions of the Meeting of the Parties under the Dubai pathway. The content of those conference room papers is reproduced in annexes II–V to the present report. It was agreed that every effort would be made to avoid holding meetings of the contact group concurrently with the meeting of any other contact group during the Third Extraordinary Meeting of the Parties.

V. Technology and Economic Assessment Panel 2016 report

37. Introducing item 5 of the agenda, the Co-Chair of the Open-ended Working Group drew attention to the three volumes of the 2016 progress report of the Technology and Economic Assessment Panel, containing, respectively, the progress reports of the Panel's technical options committees, the follow-up to decision XXVI/7 on halons, proposals for essential-use nominations, information on the discrepancies between observed atmospheric concentrations of and reported data on carbon tetrachloride, and matters relating to the membership of the Panel and administrative issues (volume 1); the initial report on critical-use nominations for methyl bromide (volume 2); and the report under decision XXVII/5 on issues related to HCFC phase-out (volume 3).

38. Members of the Panel and its technical options committees then made presentations summarizing the main findings of the report as follows: Mr. Ashley Woodcock – Co-Chair of the Panel and interim Co-Chair of the Foams Technical Options Committee; Mr. Sergey Kopylov – Halons Technical Options Committee; Ms. Marta Pizano, Mr. Ian Porter and Mr. Mohammed Besri – Methyl Bromide Technical Options Committee; Ms. Helen Tope, Mr. Jianjun Zhang and Mr. Keiichi Ohnishi – Medical and Chemicals Technical Options Committee; and Mr. Lambert Kuijpers – Senior Expert of the Panel. A summary of the presentations, as prepared by the presenters, is set out in annex I to the present report.

39. In the ensuing discussion, all the representatives who spoke expressed appreciation to the Panel and its technical options committees for their continued work and the progress report, which

they said was proving to be very useful. A number of representatives posed questions regarding matters highlighted during the presentation or discussed in the report.

40. The representative of the Russian Federation said that the report and presentation were in error in claiming that CFCs were still used in the production of metered-dose inhalers in his country; only HFCs had been used for that purpose since 2015, and CFCs were used only under an essential-use exemption for aerospace applications. Observing that the data that the Panel had reported had been taken from the Russian Federation's reporting accounting framework and industry information in the country, Ms. Tope said that the Panel would be happy to correct any incorrect information following more detailed discussion with the representative.

41. In response to a question about possible emissions of ozone-depleting substances used as feedstock during transport and storage, Ms. Tope explained that the Panel had used a leakage rate of 0.5 per cent because that was the figure estimated by the Intergovernmental Panel on Climate Change for the leakage rate for HFC production. It was very difficult, she said, to estimate those emissions due to the range of different processes that had to be considered across the range of ozone-depleting substances. She accepted, however, that since that figure did not take into account emissions during transport or storage, emissions were likely to be higher. That was a very difficult figure to estimate, however, and uses of large quantities of feedstock tended to be well managed. The Panel, however, would review new information just published and work where possible to improve estimates. She invited parties to provide any information that could be used to better characterize emissions from feedstock uses.

42. Responding to a question about the continued use of methyl bromide by one party, Mr. Porter said that there were differences in the specific circumstances of nominations by parties, particularly with regard to national regulations that affected the availability and adoption of alternatives. A positive sign, however, was that the trend in consumption was nevertheless clearly downwards. He also offered to discuss issues related to non-reported uses of methyl bromide with a representative posing a number of questions on that subject.

43. In response to a question about the disposal of unwanted halons, Mr. Porter said that cylinders should always be returned to their manufacturers rather than left to corrode, which could be dangerous. Observing that many parties had established networks for collecting such unwanted cylinders, he said that the Technology and Economic Assessment Panel could discuss the matter in more detail with interested representatives.

44. Ms. Pizano mentioned that the co-chairs had rekindled their cooperation with the secretariat of the International Plant Protection Convention in accordance with a memorandum of understanding between the Convention secretariat and the Ozone Secretariat. The Convention secretariat had indicated that the Convention's Commission for Phytosanitary Measures was considering quarantine treatments with sulfuryl fluoride and modified atmospheres for controlling some quarantine pests. A revision to International Standard for Phytosanitary Measure 15 (ISPM-15), regarding wood packaging material, to consider such new treatments, was also envisaged. One representative said in response that the Technology and Economic Assessment Panel and the Ozone Secretariat should continue their cooperation with the Panel.

45. Another member of the Committee provided information about amounts apparently traded illegally, and one representative, speaking on behalf of a group of parties, expressed the wish to discuss the matter bilaterally to gain a better understanding of the situation.

46. In response to a question about the use of the phrase "show promise" in the section of the report that described the testing of alternative refrigerants in high ambient temperatures, Mr. Kuijpers accepted that the wording was imprecise and said that it would be revised in the Panel's next report.

47. Responding to a request for clarification of tables 5.2, 5.3 and 5.4 in volume III of the Panel's report, containing information on the potential need for the production of HCFCs to meet the basic domestic needs of Article 5 parties, Mr. Kuijpers explained that in each table the middle row, labelled "consumption", set out the allowed HCFC consumption levels under the Montreal Protocol. In response to a further question about whether there were likely to be shortages of individual substances, he explained that the Panel had analysed projections for each substance, as well as for HCFCs in the aggregate, and did not believe that any shortages were likely.

48. Thanking the Panel once again for its hard work, the Co-Chair of the Open-ended Working Group suggested that representatives with other questions for the Panel could discuss them bilaterally in the margins of the meeting.

VI. Issues related to exemptions under Articles 2A–2I of the Montreal Protocol

A. Nominations for essential-use exemptions for 2017

49. Introducing sub-item 6 (a) of the agenda, the Co-Chair recalled that an essential-use exemption nomination for carbon tetrachloride for a laboratory and analytical use submitted by China was under consideration and had been mentioned during the presentation by the Technology and Economic Assessment Panel on its 2016 progress report.

50. The representative of China described the challenges that her country faced in identifying viable alternatives to carbon tetrachloride for laboratory and analytical use for testing for oil and grease in water, saying that the country placed great importance on finding solutions and was no longer requesting essential-use exemptions for the substance. China would submit a conference room paper on its carbon tetrachloride nomination for final consideration by the Twenty-Eighth Meeting of the Parties.

51. One representative, speaking on behalf of a group of parties, noted that the Technology and Economic Assessment Panel, in its progress report, had alluded to the fact that China had identified a number of internationally available methods for the analysis of oil in water, and he queried why those methods had not been applied in the country. It was promising, however, that China planned to publish new standards in 2017 for implementation in 2018. Finally, he said that the items of information requested of China by the Medical and Chemicals Technical Options Committee should be reflected in the operative text of the conference room paper to be presented by China.

52. At a subsequent session, the representative of China introduced a conference room paper presenting a proposed draft decision on an essential-use exemption for carbon tetrachloride for laboratory and analytical use for 2017 in China. The draft decision, she said, was based on the decision from 2015, decision XXVII/2, on China's essential-use exemption for the same use for 2016. The new draft decision reflected the recommendations of the Technology and Economic Assessment Panel and the comments made at the current meeting in bilateral discussions with the European Union.

53. Following the introduction of the conference room paper one representative said that his country had discovered that some substances imported as HFCs for laboratory and analytical uses were in fact HCFCs, and he requested guidance on how to obtain authorization to use the substances in a manner that complied with the party’s obligations under the Montreal Protocol.

54. Subsequently the representative of China introduced a revised version of the draft decision, which his delegation had prepared to take into account informal discussions that had taken place in the margins of the current meeting following discussion of the matter in plenary. The Working Group agreed to forward the revised draft decision, as set out in annex VI to the present report, to the Twenty-Eighth Meeting of the Parties for further consideration.

B. Nominations for critical-use exemptions for 2017 and 2018

55. Introducing the sub-item, the Co-Chair said that five parties had submitted eight nominations for critical-use exemptions for methyl bromide and that the Methyl Bromide Technical Options Committee had carried out an initial evaluation of the nominations, as outlined during the presentation by the Technology and Economic Assessment Panel on its 2016 progress report.

56. In the ensuing discussion, the representatives of Canada, Australia and South Africa expressed appreciation to the Methyl Bromide Technical Options Committee for its assessment of their country’s nominations for critical-use exemptions.

57. The representative of Canada congratulated parties on their efforts to reduce nominations and quantities for critical-use exemptions for methyl bromide. She said that Canada had in fact submitted its report on the impact of chloropicrin on groundwater to the Methyl Bromide Technical Options Committee in accordance with decision XXV/4 of the Meeting of the Parties, although the progress report of the Technology and Economic Assessment Panel indicated otherwise. Canada would provide further information on its research programme on alternatives to methyl bromide to help inform the Methyl Bromide Technical Options Committee’s assessment of the country’s nomination for a critical-use exemption for strawberry runners.

58. The representative of Australia presented an update on his country’s research programme on alternatives to the use of methyl bromide in the production of strawberry runners. Various options had shown promise but problems remained with pathogen control, phytotoxicity and other challenges. The country placed priority on identifying proven, suitable, acceptable alternatives that were in compliance

with its regulatory framework and suited to local conditions. Significant investment had been made in the research programme, which was led by a full-time researcher, and a phase-out of methyl bromide commencing in 2019 was anticipated.

59. The representative of South Africa said that his country's critical-use nomination was for the use of methyl bromide to control insect pests in flour and grain mills and in domestic and industrial premises. The majority of mills had wooden floors and ceilings, having been constructed before food safety requirements were as stringent as current requirements, and two fumigations per year were needed to meet current regulations pertaining to food hygiene and to ensure food security in the face of drought. Considerable efforts were being made to reduce the dosage of methyl bromide and to identify alternatives.

60. One representative, speaking on behalf of a group of parties, noted the progress of many countries in reducing or eliminating use of methyl bromide; Mexico, for example, had not put forward a nomination for a critical-use exemption in the current year. Further discussions were needed to fully understand the nominations by the five nominating parties. In addition, he noted that according to the report of the Technology and Economic Assessment Panel some countries submitting critical-use nominations had not submitted their accounting frameworks or national management plans, as required by paragraph 9 (f) of decision Ex.I/4, and he urged those parties to prepare those documents for submission prior to the Meeting of the Parties.

61. It was agreed that the Methyl Bromide Technical Options Committee, the nominating parties and other interested parties would further discuss the nominations bilaterally in the margins of the current meeting and intersessionally with the aim of facilitating the development of final recommendations by the Committee to be considered at the Twenty-Eighth Meeting of the Parties.

VII. Issues related to the phase-out of hydrochlorofluorocarbons (decision XXVII/5)

62. Introducing the item, the Co-Chair said that, in accordance with decision XXVII/5, the Technology and Economic Assessment Panel had prepared a report on the amounts of hydrochlorofluorocarbons (HCFCs) that might be needed in non-Article 5 parties during the period 2020–2030 for essential uses in sectors and subsectors, for servicing in the refrigeration and air-conditioning sector and other sectors, and for the basic domestic needs of Article 5 parties. The report on the matter was contained in volume 3 of its 2016 report.

63. One representative, speaking on behalf of a group of parties, said that it was possible to conclude from the report that essential-use exemptions would probably be needed in only a limited number of cases, that there would be no further need for production for basic domestic needs and that HCFCs would probably not be needed for servicing. The Technology and Economic Assessment Panel, however, should continue its work on the matter and gather further data, particularly with regard to demand after 2020. Such data would help inform the consideration of such issues as whether the essential-use exemption for laboratory and analytical uses should be extended. There would also be a need in the future to gather information on stocks of HCFCs. He also queried why there had been a sudden increase in the difference between consumption and production of HCFC-22.

64. Another representative said that in producing its report the Panel had had to contend with many uncertainties regarding the future consumption of HCFCs, in the light of which it would be prudent to maintain a small servicing tail and to consider removing the restriction that limited it to existing refrigeration and air-conditioning equipment, given the possibility that other types of equipment might also need servicing. She concurred that there would probably be no continuing need for production for basic domestic needs but said that further data gathering would aid in making that decision. On the matter of permitting HCFCs to be used for laboratory and analytical uses, she said that that might require a change to the Montreal Protocol, which could be of relevance to the timing of discussions on the matter.

65. Another representative expressed support both for maintaining a small servicing tail for existing equipment and for considering whether to extend the tail beyond the refrigeration and air-conditioning sector. She also said that she supported the extension of essential use exemptions for laboratory and analytical uses beyond 2020 and would welcome further discussion with the Panel on production for basic domestic needs.

66. Another representative drew attention to the extensive discussion on the linkages between HCFC phase-out and HFC phasedown during the recently concluded resumed thirty-seventh meeting of the Open-ended Working Group, which had resulted in an agreed text that was of considerable relevance to the calculation of future HCFC needs.

67. It was agreed that interested parties would consult informally on the matter during the current meeting and report to the Working Group on the outcome of those consultations.

68. Subsequently the Co-Chair reported that no conference room papers had been submitted for consideration as the result of any informal consultations, and it was agreed that interested parties would submit any further proposals for consideration by the Twenty-Eighth Meeting of the Parties.

VIII. Availability of recovered, recycled or reclaimed halons (decision XXVI/7)

69. Introducing the item, the Co-Chair recalled that by decision XXVI/7, on the availability of recovered, recycled or reclaimed halons, the Meeting of the Parties had requested the Secretariat to report on any information submitted by parties on their efforts, in accordance with paragraph 1 of that decision, to liaise with national civil aviation authorities on the supply of recovered, recycled or reclaimed halons for civil aviation and the steps being taken to expedite the replacement of halons in that sector. Information had been received from four parties – Australia, Canada, the European Union and the United States of America – and subjected to a technical review by the Halons Technical Options Committee, a summary of which was presented in volume 1 of the 2016 report by the Technology and Economic Assessment Panel (subsection 3.3.5).

70. In the ensuing discussion one representative, speaking on behalf of a group of parties, said that a clear message must be sent to the aviation industry to accelerate its progress in the development, approval and deployment of halon alternatives. The adoption by the Assembly of the International Civil Aviation Organization (ICAO) of a resolution that would pave the way for the replacement of halons in cargo compartment fire suppression systems by 2024 was encouraging, he said, even though an earlier deadline would have been preferable, but ICAO standards were not legal requirements and the Meeting of the Parties should therefore urge parties to make them mandatory through national legislation. Meanwhile, parties planning further halon production for aircraft applications in the short term, he said, should be encouraged to focus instead on the development of alternatives; the large quantities of halons that, according to volume 1 of the Technology and Economic Assessment Panel's 2016 report (subsection 3.4.4), might be available from salvaged ships could be recycled and reused in aircraft applications; and the tricky issue of halon uses, which had been on the table for some years, might be resolved more quickly if the Technology and Economic Assessment Panel, the Secretariat and ICAO cooperated more closely to ensure the exchange of relevant information. Another representative said that another obstacle to progress was that some countries lacked the facilities for halon recovery and were compelled to export the substances while they were still giving off emissions.

IX. Terms of reference for the study on the 2018–2020 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol

71. Introducing the item, the Co-Chair drew attention to the terms of reference for a study by the Technology and Economic Assessment Panel on the amount of funding required for the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the period 2015–2017 (UNEP/OzL.Pro.WG.1/38/2 (annex III)), suggesting that it could serve as a basis for the deliberations at the current meeting on the development of terms of reference for the development of a study on the replenishment of the Fund for the period 2018–2020.

72. In the ensuing discussion, all representatives that spoke, including one speaking on behalf of a group of parties, agreed that the terms of reference for the study on the 2015–2017 replenishment would provide a good starting point for the development of the current study and that a contact group should be formed to discuss the matter further. One representative suggested posting the guidance provided to the Technology and Economic Assessment Panel in decision XXV/8 on the meeting portal in order to assist the contact group in its work. Another representative, supported by a third, suggested including a reference to the possible costs of a subsidy to encourage Article 5 parties to take early action on HFC control measures, regardless of whether related measures entered into force by the end of the replenishment period; and a fourth added that a scoping study by the Technology and Economic Assessment Panel on such early action would be useful. One representative said that the focus at the current meeting should be on airing new ideas and on general principles rather than the details of the terms of reference. Another suggested aligning the replenishment cycle with that of the cycle for the setting of the United Nations scale of assessments, saying that the current lack of alignment had previously left some parties experiencing budgetary shortfalls.

73. The Open-ended Working Group established a contact group, co-chaired by Mr. Philippe Chemouny (Canada) and Mr. Obed Baloyi (South Africa) to discuss the matter further, based on the terms of reference for the study on the 2015–2017 replenishment and taking into account the discussions in plenary.

74. At a subsequent session, the co-chair of the contact group presented draft terms of reference for a study on the amount of funding needed for the 2018–2020 replenishment of the Multilateral Fund, which included square brackets around text relating to a number of matters on which the contact group had not reached agreement. He reported that the group had concluded that aligning the replenishment with the cycle for the United Nations scale of assessments was not appropriate in the context of the replenishment of the Multilateral Fund. A number of parties, however, were expected to continue discussing the matter informally in the margins of the current meeting.

75. The Open-ended Working Group agreed to forward the draft terms of reference, as revised by the contact group and set out in annex VII to the present report, for further consideration by the Twenty-Eighth Meeting of the Parties.

X. Report by the Technology and Economic Assessment Panel and the Scientific Assessment Panel on analysis of the discrepancies between observed atmospheric concentrations and reported data on carbon tetrachloride (decision XXVII/7)

76. Introducing the item, the Co-Chair recalled that the Meeting of the Parties, in decision XXVII/7, had reiterated its concern about the discrepancies between observed atmospheric concentrations and reported data on the production and consumption of carbon tetrachloride and had requested the Technology and Economic Assessment Panel and Scientific Assessment Panel to continue its analysis of the matter and report on the results to the Twenty-Eighth Meeting of the Parties.

77. The representative of the Scientific Assessment Panel announced that the report to be presented to the Twenty-Eighth Meeting of the Parties would take into account a report recently released by the World Climate Research Programme under its Stratosphere-troposphere processes and their role in climate (SPARC) project, entitled “The mystery of carbon tetrachloride”, which had been posted on the meeting portal together with a factsheet on the findings prepared by the Scientific Assessment Panel.

XI. Destruction of banks of ozone-depleting substances (UNEP/OzL.Pro.27/13, para. 114)

78. Introducing the item, the Co-Chair recalled that the issue of the destruction of ozone-depleting substances had been raised at the Twenty-Seventh Meeting of the Parties. The Meeting of the Parties had not had sufficient time to discuss the matter, however, and had accordingly decided that it should be considered by the Open-ended Working Group at a subsequent meeting. He drew attention to background information provided by the Secretariat (UNEP/OzL.Pro.WG.1/38/2, paragraphs 34–37), noting that some of it was also relevant to the discussion on the terms of reference for the study on the 2018–2020 replenishment of the Multilateral Fund.

79. In the ensuing discussion, the representative of the party that had raised the issue at the Twenty-Seventh Meeting of the Parties said that parties needed Multilateral Fund support to assist them in the management and disposal of unwanted refrigerants. She said that while support for that purpose was not currently available from the Multilateral Fund small island developing States and other parties lacking the resources to recover, recycle, destroy or safely transport those substances were keen to discuss the matter further at the current meeting, including bilaterally, adding that it had been under discussion since the First Meeting of the Parties; that pilot projects had been carried out and technologies had been approved; and that it had even been taken into account in the talks on the Dubai pathway on HFCs. Its inclusion in the current agenda gave parties needing such support an opportunity to express their concerns and seek guidance, funding and information on sources of support other than the Multilateral Fund. Another representative, speaking on behalf of a group of parties and seconding the previous speaker’s comments, said that there were key lessons to be learned from Multilateral Fund projects under way; that it was important to ensure the institutional and regulatory sustainability of future actions by developing synergies with other multilateral environmental agreements such as the Basel Convention on the Control of the Transboundary Movements of Hazardous Wastes and Their Disposal and the Stockholm Convention on Persistent

Organic Pollutants, as well as the Strategic Approach to International Chemicals Management and the Global Environment Facility; and that her delegation was open to considering options for providing assistance for capacity-building activities and to discussing the matter informally with others.

80. The Open-ended Working Group decided that the contact groups on HFCs and on the terms of reference for the study on the 2018–2020 replenishment of the Multilateral Fund should also discuss support for the destruction of ozone-depleting substances.

XII. Technology and Economic Assessment Panel: organizational matters

81. Introducing the item, the Co-Chair said that the main issue to be dealt with was membership of the Technology and Economic Assessment Panel, information on which was presented in annex 1, volume 1 of the Panel's 2016 progress report. In accordance with the terms of reference for membership of the Panel and its technical options committees, the Co-Chair invited parties to submit nominations for membership on the Panel for final decision by the Twenty-Eighth Meeting of the Parties. Nominations for Panel membership could be made during the current meeting or the Twenty-Eighth Meeting of the Parties, and nominations to the Panel's technical options committees could be made directly to the Technology and Economic Assessment Panel or through the Ozone Secretariat at any time.

82. One representative, speaking on behalf of a group of parties, said that all persons nominated should have the level and type of expertise required for Panel membership and that the final selection of members should take account of the requisite regional and gender balance.

83. The Working Group agreed to the way forward proposed by the Co-Chair.

XIII. Other matters

Proposal to establish an ad hoc standards coordination group

84. The Co-Chair introduced the agenda item.

85. The representative of China introduced a conference room paper containing a draft decision that would establish an ad hoc standards coordination group. The aim of the initiative was to improve coordination with relevant international and regional standards bodies on the revision and updating of international safety standards pertaining to the use of alternative substances, including flammable refrigerants, in refrigeration and air-conditioning products and equipment. The issue of safety standards had implications for the phasedown of HFCs and was one of the major challenges identified in the Dubai pathway. The proposed ad hoc standards coordination group would keep parties apprised of progress being made in the revision of standards, including through a proposed workshop on standardization to be held in 2017.

86. In the ensuing discussion many representatives thanked China for taking the initiative on the matter and expressed interest in engaging in further discussion on the draft decision. A number of representatives said that international safety standards should take account of changes in technology and be updated accordingly while continuing to ensure the safety of workers and the public. One representative said that significant work had been undertaken in recent years on applications and technologies that involved flammable alternatives and that it was timely and appropriate for those advances to be incorporated into international safety standards. He stressed that the aim was not to lower safety standards but rather to adapt them to the technological advances. One representative said that it was necessary to take account of existing work on standards pertaining to low-GWP alternatives and that care needed to be taken in defining the role of the parties to the Montreal Protocol in any possible coordinating activities on international standard setting. One representative said that international safety standards merely set benchmarks and that it was therefore critical to incorporate them into national legislation.

87. Some representatives, including one speaking on behalf of a group of parties, welcomed the suggestion of a workshop in order to exchange ideas on the issue and to discuss how to move forward while keeping within the mandate of the Montreal Protocol.

88. Several representatives urged that a cautious approach be adopted in any deliberations dealing with safety standards, with safety considerations remaining paramount. One representative said that standards should not be lowered for the mere purpose of facilitating market access for certain products.

89. The representative of China, responding to some of the issues raised, expressed satisfaction at the level of interest in the matter. She stressed that the aim was not to lower safety standards but to assist the transition to low-GWP alternatives and to ensure their safe use. Considerable work was being undertaken on low-GWP technologies along with related risk assessments, and it was important to engage with international safety standards organizations, including the International Standards Organization, so that relevant standards could be revised in an efficient and timely manner, thus helping parties to fulfil their obligations under the Montreal Protocol.

90. In response, several representatives expressed further concern over the safety aspects of the initiative and said that the draft decision needed to be revised to accommodate their concerns. One representative said that any lowering of safety standards was not acceptable if safety itself would be compromised.

91. The Working Group decided that interested parties would discuss the matter informally and report to the Open-ended Working Group on the results of their discussions.

92. Subsequently, the representative of China introduced a revised version of the draft decision, saying that it had been produced to reflect the comments of interested parties. Several representatives indicated that it would be necessary for parties to consult at the national level regarding the revised draft decision, in the light of which the Working Group decided to forward it, as set out in annex VIII to the present report, for further consideration by the Twenty-Eighth Meeting of the Parties.

XIV. Adoption of the report

93. The parties adopted the present report on Thursday, 21 July 2016, on the basis of the draft report set out in document UNEP/OzL.Pro.WG.1/38/L.1. The Ozone Secretariat was entrusted with the finalization of the report.

XV. Closure of the meeting

94. The Working Group agreed at 5.40 p.m. on Thursday, 21 July 2016, to suspend the current meeting and, as indicated in section IV above, to resume it in the margins of the Third Extraordinary Meeting of the Parties solely to allow the continuation of the work of the contact group on the feasibility and ways of managing HFCs, including through informal consultations.

Annex I

Summaries of presentations by the members of the Technology and Economic Assessment Panel

A. Decision XXVII/4 task force report

1. Mr. Lambert Kuijpers, Ms. Bella Maranion and Mr. Roberto Peixoto, co-chairs of the task force established by the Technology and Economic Assessment Panel to prepare the report called for by decision XXVII/4, made a presentation on the second version of the task force report. Ms. Maranion started the presentation by briefly reviewing the decision, which requested the Panel to prepare a report that would update and provide new information on the alternatives to ozone-depleting substance based on guidance and criteria set out in decision XXVI/9. The decision indicated that the report should also take into account the most recent findings from programmes for the testing of refrigerants under high ambient temperature (HAT) conditions and the other parameters outlined in the decision. She said that the Panel had convened a task force of initially 28 and subsequently 31 members from the Panel and its technical options committees, along with outside experts. She expressed appreciation for the efforts of the task force members in the preparation of the second version of the task force report. Given the additional meeting of the Open-ended Working Group in 2016 and the focus of that meeting, she explained, the Panel had taken a three-part approach to its response to the decision. The version of the task force report, which had been presented to the Open-ended Working Group at its thirty-seventh meeting, had focused on the refrigeration and air-conditioning (R/AC) sector, including updates on alternatives in that sector based on those listed in the Panel's September 2015 decision XXVI/9 task force report. It had also provided information on programmes for testing alternative refrigerants under HAT conditions and extended the mitigation scenarios to 2050. The second, updated, version of the task force report, which had been prepared for the Working Group's thirty-eighth meeting, provided further updates to the R/AC sector information based on informal discussions held at the thirty-seventh meeting. It also responded to other parts of decision XXVII/4, including by providing information on alternatives to refrigeration systems in fishing vessels and updating the information on the HAT refrigerant testing programmes and the scenarios assumptions. For the Twenty-Eighth Meeting of the Parties, the task force would prepare a further updated report, as appropriate, taking into account the discussions during the thirty-eighth meeting of the Working Group and any new information available to the task force.

2. At the thirty-seventh meeting of the Open-ended Working Group informal discussions were held with parties, a summary of which was included in the annex to the current version of the report. Based on those discussions, Ms. Maranion outlined the specific topics that were addressed in the current report within the scope of the current decision and that could be dealt with in the time available the thirty-seventh and thirty-eighth meetings of the Working Group. Those topics included updates on refrigerants, specifically information on R/AC and not-in-kind (NIK) technologies, safety standards for new alternatives and the criteria that determined whether an alternative was "environmentally sound." It also dealt with programmes for the testing of refrigerants under HAT conditions, providing a more balanced (i.e., positive as well as negative aspects) discussion of the testing results and the use of a table format to better present the testing information. The final topic dealt with in the report was the scenarios, including detail on the information used, including with regard to annual hydrofluorocarbon (HFC) production reporting and the specific HFCs included, the estimated growth rates used and consideration of a longer, 18-year, manufacturing conversion period. She indicated that the remainder of the presentation would elaborate on how the report addressed those specific topics. With regard to a further discussion of the criteria for "environmentally sound" with regard to refrigerants, she said that the term could be broadly defined, along with the similarly used term "environmentally sustainable." The report considered those broad definitions and some of the frameworks where they were used, but used a narrower definition, considering that alternatives described as "low-GWP" or "lower-GWP" aimed at satisfying the criteria of "environmentally sustainable" or "environmentally sound."

3. Mr. Kuijpers then presented updated information from the report related to refrigerants and technologies in the R/AC sector, alternative refrigerants for the various types of R/AC equipment, NIK alternative technologies, the latest developments for the use of efficient CO_2 technology and the use of standards for the safe use of refrigerants in the R/AC industry. He said that CO_2 (R-744) was increasingly being used in supermarket systems worldwide, both in cascaded systems and in transcritical systems, where the latter were being researched extensively with the aim of reducing energy penalties. In mobile air conditioners (MACs) the penetration of HFO-1234yf for new vehicles had continued and had spread to many additional car models, primarily in non-Article 5 parties, but

was still far from complete; furthermore, the development of R-744 MACs had continued and commercialization appeared imminent. He then said that vapour compression had been the primary technology for all R/AC applications in the preceding 100 years and that several technologies not employing vapour compression technology (NIK technologies) had been under development for many years. With regard to standards, both the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) were active. He said that both organizations' standards included refrigerant safety (definitions and charge limits) and maintenance (safe practices, etc.). In particular, charge limits had a profound influence on which refrigerants were considered safe to use and where they might be used.

4. Mr. Peixoto presented information on the new chapter and annex in the current version of the report related to alternatives for refrigeration systems on fishing vessels. The new chapter responded to the request in decision XXVII/4 to provide available new and updated information related to "the availability of alternatives for replacement and retrofit of refrigeration systems in fishing vessels, including in small island countries." He mentioned that 70 per ent of the global fishing fleet continued to use HCFC-22 and that the challenge represented by a feasible transition to low-GWP alternatives was very important in the Asia-Pacific region, where 70 per cent of the global fishing fleet was based and where the economy was heavily dependent on the fishing industry. He said that there were options for achieving a transition from high-GWP to low-GWP alternatives, which could be rated according to the degree of financial, technical and regulatory risk that they posed. The first option was the use of the non-halocarbon refrigerants ammonia (R-717) and carbon dioxide (R-744). Due to costs and necessary modifications, R-717 was not a viable solution for the replacement or retrofit of plants on existing vessels but could be considered for new ships or complete rebuilds. There was, however, some positive experience with the use of R-744 in such circumstances. Concerning cost, R-717 and R-744 systems were currently competing with the cost of HFC systems. A second option was HCFC-22 replacement with plant adjustments. He said that many HFC blends were currently being examined but no solution was yet available. A medium-term solution could be anticipated, and possible alternatives would most likely be in category A2 or category A2L (mildly flammable refrigerants) requiring adequate safety measures. A third option was the use of drop-in refrigerants, and retrofits using moderate-GWP refrigerants would be appropriate for systems with fewer than 10–15 years of service life. A fourth option would be to continue the use of HCFC-22 for systems with no more than 4 or 5 years of service life remaining. One issue to be considered with regard to option 4 was how to meet ozone-depleting substance regulatory requirements of importing countries.

5. He then presented updated and new information related to the testing of alternatives under HAT conditions. The revised chapter on the subject provided further information on the reports published for projects under which alternative refrigerants were tested at 35°C and at around 52°C, including tabulated summaries of each of the projects. The main aspects of the testing projects presented were:

(a) PRAHA: Phase I concluded and report published, 13 custom-built prototypes in four categories, testing five different alternatives against the baseline refrigerants HCFC-22 and R-410A. Phase II approved and will be started in 2016;

(b) EGYPRA: ongoing, and no results published to date;

(c) U.S. Department of Energy: phase I concluded October 2015 with a report published. Testing of 10 alternatives in two units against HCFC-22 and R-410A, changing the amount of refrigerant charge and expansion device (soft optimization). Phase II started in the course of 2016;

(d) AREP: phase I concluded in 2014. Phase II concluded in 2016; testing being reported, 33 reports published. AREP-II testing was conducted by several entities with different test protocols. Seventeen refrigerants total (HFC-32, DR-5A, DR-55, L-20, L-41, N-20, ARM-20, ARM-71A, HPR2A etc.) were tested on a large variety of baseline systems originally charged with HCFC-22, R-404A, R-407C or R-410A either as drop-in or with soft optimization.

6. He then presented the following observations regarding testing projects: current HAT project testing results (PRAHA, ORNL, AREP) were difficult to compare; the use of comparable testing parameters in future testing and field trials would be helpful in the assessment of results; there was a need for a comprehensive risk assessment of flammable alternatives during installation, servicing and decommissioning under HAT conditions; commercial availability of both new refrigerants and components for the optimization of R/AC equipment would affect the transition.

7. Mr. Kuijpers then presented information on the updates to the chapter on the business-as-usual (BAU) and mitigation (MIT) scenarios. He listed the factors taken into account, such as existing and pending regulations in non-Article 5 parties and the impact of the latter; a revised table on growth

percentages for the various R/AC subsectors; additional information on the production of various HFCs, including but not limited to the principal ones for the R/AC sector; an addition of an 18-year manufacturing conversion period for the Article 5 party MIT-3 scenario and its impact on total demand. He mentioned that annex 3 provided an overview of final regulations in the European Union, the United States and Japan, all addressing HFCs.

8. With regard to regulations considered for the non-Article 5 party BAU scenario, he outlined the European Union and United States regulations, noting that the projection for the scenario without regulations extended only to 2030 due to uncertainty regarding what further regulations, policies and alternative choices might be made beyond that year. He showed two curves that illustrated the impact of the two BAU approaches. Regarding the MIT scenarios, he stressed that they had not changed compared to those in the earlier version of the report and that for the MIT-3 scenario the demand for various manufacturing conversion periods had been determined for a period varying from 6 to 18 years for Article 5 parties. He then showed the integrated total demand values calculated for BAU and MIT-3, MIT-4 and MIT-5 for the periods 2020–2050 and 2020–2040. The greatest saving over the BAU scenario, on the order of 75 per cent, was seen in the MIT-3 scenario for the period 2030–2050. He then showed graphs for various conversion periods and the impact on total demand in manufacturing for the MIT-3 scenario. A six-year manufacturing conversion period resulted in a fast decrease in total demand after the start of conversion; a 12-year conversion period resulted in a very slow decrease of total demand after the start of conversion, and an 18-year conversion period resulted in continued high demand during the first 12 years after the start of conversion, with demand beginning to decline only at the end of that period.

9. He concluded by saying that the next step in the response to decision XXVII/4 would be the preparation of a further updated version of the report for the Twenty-Eighth Meeting of the Parties, as appropriate, taking into account the discussions during the thirty-eighth meeting of the Open-ended Working Group and any available new information.

2. 2016 report of the Technology and Economic Assessment Panel

10. The presentation on the 2016 report of the Technology and Economic Assessment Panel was introduced by Mr. Ashley Woodcock, Co-Chair of the Panel and co-chair of the interim Flexible and Rigid Foams Technical Options Committee (FTOC), who outlined the overall plan of presentations to include the progress report of each technical options committee, recommendations on critical-use exemptions and one essential-use exemption, follow-up to decision XXVI/7, on halons, and the response to decision XXVII/5, on hydrochlorofluorocarbons (HCFCs).

11. He then presented the FTOC progress report. He reported that FTOC was functioning well, with 90 per cent attendance of its members at the FTOC meeting in May 2016 in Montreal and consensus on the progress report. Foam demand was increasing by 5 per ent each year, to 27 million tonnes in 2019, and products were important for climate and food protection. There were many foam manufacturers who, in turn, were supplied by fewer system houses and even fewer chemical companies producing foam blowing agents. A transition to new blowing agents led to system reconfiguration at system houses and could pose major challenges to the many foam manufacturers, especially small- and medium-sized enterprises (SMEs) in Article 5 parties. Mr. Woodcock noted an error in the progress report in relation to the phasedown (rather than phase-out) of HFCs in Australia, and he presented the agreed corrected text. He also described some of the challenges that could arise during a transition to low-GWP alternatives for foam blowing. Long-term thermal performance should be considered, as well as the many different regulations that affect the choice of agent, including requirements relating to energy efficiency, fire safety and volatile organic compounds. Many Article 5 party foam manufacturers could leapfrog from HCFC blowing agents to low-GWP alternatives, but the choice of alternatives was evolving. Hydrocarbons had high capital cost for SMEs related to the need to manage fire safety. Hydrofluoroolefins (HFOs) and hydrochlorofluoroolefins (HCFOs) had zero or low flammability but were currently expensive. Methyl formate and methylal were flammable, but that was partially offset by pre-blending with polyols. Optimized blends of all blowing agents, including methyl formate, methylal, HFOs and HCFOs, might provide solutions that minimized the disadvantages of individual agents. He noted that the RTOC progress report was being deferred so as not to duplicate the information provided in recent task force reports, in particular that of the decision XXVII/4 task force for the thirty-eighth meeting of the Open-ended Working Group.

12. Mr. Sergey Kopylov, co-chair of the Halons Technical Options Committee (HTOC), made a presentation on the HTOC progress report consisting of an update on alternatives, an update on the military and aviation sector and information on the follow-up to decision XXVI/7. With regard to alternatives for halons, he noted that in addition to 3,3,3-trifluoro-2-bromo-propene (2-BTP) there were five new agents being developed: three for streaming applications to replace halon 1211 and two

for flooding applications to replace halon 1301. Those agents were at different stages of development, with some only available in laboratory quantities. One agent, HCFO-1233zd(E), was already in production as a foam blowing agent, solvent and refrigerant and had been submitted through the United States Environmental Protection Agency's Significant New Alternatives Policy (SNAP) programme as a total flooding fire extinguishing agent. It was possible, therefore, that one more extinguishing agent would be available in the near future. Regarding the military sector, he reported that the United States Army had hosted a two-day military fire protection workshop in October 2015, while another workshop was being planned for 2017. The 2015 event had been attended by participants from other United States military services, industry, academia and allied military partners. The participants discussed such issues of mutual concern as halon and HFC fire extinguishing agent replacements and emerging threats such as lithium ion batteries. The event allowed a good exchange of information, and HTOC was providing information on it to parties to the Montreal Protocol to encourage the participation of their militaries in future similar collaborations.

13. He reported that HTOC also continued to work with the International Civil Aviation Organization (ICAO) on the phase-out of halons in civil aviation. The Committee expected that ICAO would approve 2024 as the date when halons could no longer be used in cargo bays of newly designed aircraft. It was also important that 2-BTP obtain regulatory approval in the United States for import in portable extinguishers and engine nacelles for aircraft. As to European Aviation Safety Agency rulemaking, adoption of a final regulation governing halon use in aviation was expected in 2017. The applicable dates anticipated dates were one year after entry for lavatory systems (replacement of halon 1301) and 31 December 2018 for portable extinguishers (replacement of halon 1211).

14. He also provided information on the follow-up to decision XXVI/7. In accordance with the decision the Ozone Secretariat had received information from four parties: Australia, Canada, the European Union and the United States. He summarized the key messages from the responses, which were very informative and expressed concern that supplies of recycled halons might be insufficient to meet future civil aviation needs.

15. Ms. Marta Pizano, co-chair of the Methyl Bromide Technical Options Committee, began the presentation on that committee's progress report by recalling that controlled uses of methyl bromide by all parties were currently only allowed in accordance with critical-use exemptions. For that reason, over 90 per cent of methyl bromide was currently used for quarantine and pre-shipment (QPS), which was an exempted use. Consumption for QPS had remained relatively stable at 11,000 metric tonnes per year but was increasing in Article 5 parties and decreasing in non-Article 5 parties. She also indicated that some major challenges persisted in respect of controlled uses, including illegal trade of methyl bromide, a lack of reporting of stocks and some non-reported uses.

16. New developments with regard to methyl bromide alternatives for QPS uses included controlled atmospheres for grain and ethane dinitrile (EDN) for logs; that was significant because the use of methyl bromide to protect grain and logs was among the largest current uses of methyl bromide for QPS purposes. In addition, New Zealand had passed legislation providing that as of 2020 all methyl bromide fumigations for QPS purposes would need to be undertaken with recapture equipment. She further addressed reports from the International Plant Protection Convention (IPPC) indicating that consideration would be given to the revision of International Standard for Phytosanitary Measures No. 15 (ISPM-15) to allow for quarantine treatments utilizing sulfuryl fluoride and modified atmospheres.

17. In finalizing her presentation she mentioned that remaining challenges regarding methyl bromide included alternatives for nurseries given the high level of health required for plant propagation materials and the way in which pests and diseases might be classified differently from party to party (i.e., as QPS uses versus controlled uses for which a critical-use exemption was required). An increase in some diseases (e.g., *Macrophomina* rot of strawberry fruit) stemming from the use of alternatives was also challenging.

18. Mr. Ian Porter, on behalf of the two other co-chairs of the Methyl Bromide Technical Options Committee, Mr. Mohammed Besri and Ms. Pizano, began the presentation on the Committee's interim recommendations for 2017 and 2018 critical-use exemptions by providing an overview of the trends in and outcomes for the critical-use nominations for 2017 and 2018. He reported that critical-use exemption requests for methyl bromide from non-Article5 parties had fallen from 146 nominations for 18,700 tonnes in 2005 to two nominations, from Canada and Australia, for 34 tonnes in 2018. In Article 5 parties the total amount of methyl bromide nominated for critical-use exemptions had fallen from 530 tonnes in 2015 to 300 tonnes for 2017, with Mexico not submitting a nomination in the current round. Article 5 parties that had submitted nominations in the current round were Argentina, China and South Africa.

19. He noted that total reported stocks from all parties amounted to 140 tonnes. That marked the first round of nominations in which Article 5 parties had reported stocks; in addition, one Article 5 party submitting a critical-use nomination had not reported and the rest had reported having no stocks. He added that, as usual, the Committee's critical-use exemption recommendations had not been adjusted to account for stocks. He then provided an overview of the final recommendations for critical-use exemptions for six nominations for preplant use (soil fumigation). Those came from two non-Article 5 parties (Canada and Australia) and three Article 5 parties (Argentina, China and South Africa). For Australian strawberry runners in 2018, the interim recommendation was to reduce the nominated amount by 15 per cent, from 29.76 tonnes to 25.766 tonnes, based on a small reduction (0.03 tonnes) for treatment of substrates and the rest on fumigating with available alternatives (i.e., 1,3-D/Pic) earlier in the cropping cycle when the soil was warmer and problems associated with cold soil conditions did not arise. The current research programme might be updated to the current meeting of the Open-ended Working Group in accordance with decision XXV/4.

20. For Canadian strawberry runners, the Committee considered that it was unable to assess the nomination for 2017 of 5.261 tonnes because it judged the research programme to support the nomination to be inadequate and that the chloropicrin groundwater issue was still unclear; it was expected, however, that the Party might provide a further update during the current meeting as required under decision XXV/4. After the interim assessment, Canada had provided information indicating that a detailed, funded research programme was planned for its remaining critical use. For the Argentina strawberry fruit nomination of 45.3 tonnes, the Committee accepted that there were limitations on the effectiveness of alternatives in cool regions but recommended a reduced amount of 35.71 tonnes based on uptake of barrier films with methyl bromide over a two-year period and the adoption of available alternatives (i.e., 1,3-D/Pic). For the tomato nomination of 75 tonnes, the Committee accepted that there were currently no alternatives for the Nacobbus nematode. The interim recommendation had been based on the uptake of barrier films with methyl bromide over a two-year period. For the two China nominations (open field and protected ginger), the interim recommendations were reduced 13 per cent to account for the uptake of barrier films with methyl bromide over a two-year period.

21. Mr. Besri then finalized the presentation by presenting the critical-use exemption nomination for methyl bromide use in commodities and structures submitted by South Africa. The interim recommendations reduced the nominated amounts in the two key sectors named in the nomination, mills and dwellings. For mills, the nominated amount of 13 tonnes was reduced based on a fumigant dosage rate of 20 g/m³ and a maximum of one fumigation per year and as a transitional measure to allow time for the adoption and optimization of alternatives. The reduction for dwellings (houses) was based on a rate adjustment to conform to the Committee's standard presumptions. In finalizing the presentation, he summarized the highlights as follows: the United States had not submitted a critical-use nomination in the current round; Mexico had not submitted a nomination in the current round and informally indicated that stocks were available; and China had indicated its intention to make 2018 the last year for which it would submit critical-use nominations. Not all parties provided accounting frameworks as required under paragraph 9 (f) of decision Ex. I/4, which was important because accurate reporting of stocks was critical to assessments. Finally, he noted that Israel had informed the Ozone Secretariat of an emergency use of 500 kg of methyl bromide for museum artifacts.

22. Ms. Helen Tope, co-chair of the Medical and Chemicals Technical Options Committee, introduced the Committee's inaugural progress report, announcing that the global transition away from CFC-based metered-dose inhalers was almost complete, with the remaining manufacture of such inhalers being effected through the use of CFC stockpiles. Thus the global market would be CFC-free in the succeeding few years. Proprietary dry powder inhaler devices continued to diversify, with companies investing in their own unique delivery technologies. The metered-dose inhaler remained the mainstay of inhaled therapy, with about 60 per cent of the global market. In Article 5 parties, inhaler use had increased overall and dry powder inhaler use had become more widely accepted. Mr. Jianjun Zhang, co-chair of the Committee, reported on the Committee's review of information on process agents submitted by parties in accordance with decision XVII/6. Based on the information provided or no longer reported, he said, the Meeting of the Parties might wish to consider removing from table A of decision XXIII/7 the production of chlorinated polypropene, chlorinated ethylene vinyl acetate and methyl isocyanate derivatives; Israel for NCl_3 elimination in chlor-alkali production; and the United States for the production of chlorosulfonated polyolefin. In addition, individual parties might wish to consider reducing the quantities of make-up/consumption and maximum emissions levels in table B of decision XXIII/7 based upon their own reported data. Parties might also wish to consider updating their information on the remaining eleven process agent uses and provide information on currently used technology, technology used for reducing emissions, actual emissions, and alternatives available for replacing ozone-depleting substances in those processes, by the end of 2017 in time for

inclusion in the Committee's next report under decision XVII/6, in early 2018. Mr. Keiichi Ohnishi, co-chair of the Committee, then continued the presentation, reporting on the Committee's review of and recommendation for the 2016 essential-use exemption nomination from China for 65 tonnes of carbon tetrachloride for use in water analysis. In 2016 China had reported difficulty in implementing a new standard using mid-infrared laser spectroscopy and had decided to substitute tetrachloroethylene for carbon tetrachloride, allowing the continued use of existing infrared photometry equipment. The Committee requested that China, prior to any further nomination, provide specific information on any evaluation of the use of other international analytical methods; progress in the development of its alternative method, including the purification of tetrachloroethylene; and a timeline for the phase-out of laboratory and analytical uses of carbon tetrachloride, indicating anticipated steps and dates in that process.

23. Mr. Kuijpers then continued with the presentation, providing information on the report prepared by the working group established by the Technology and Economic Assessment Panel in response to decision XXVII/5, on behalf of the working group co-chairs Mr. Daniel Verdonik and Ms. Shiqiu Zhang. In decision XXVII/5 the Meeting of the Parties requested the Panel to investigate and prepare a report, for consideration by the Open-ended Working Group at its thirty-eighth meeting, on three separate requests by parties, one related to an estimate of essential use quantities for non-Article 5 parties as of 2020, another related to an assessment of 2020–2030 servicing requirements for non-Article 5 parties and a third related to a report on volumes of recently produced HCFCs, estimates of future production and the estimated needs of Article 5 parties to satisfy basic domestic needs beyond 2020. Mr. Kuijpers described the composition of the working group, which consisted of nine members of the Panel. He elaborated on the approach to the response to decision XXVII/5 and mentioned a number of elements. The situation with HCFCs was not comparable to CFCs; for many years Article 5 parties had been the largest producers of many HCFCs such as HCFC-22, HCFC-141b and HCFC-142b. In putting the report together, the working group considered various sources of information such as party submissions (from Australia, Canada and the United States), Ozone Secretariat reported HCFC data for 2010–2014, country programme data from the secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol for 2009–2014 and Article 5 party HCFC consumption data for 2020 from available HCFC stage I phase-out management plans.

24. He noted that HCFC production in the 1990s had been much higher in non-Article 5 parties than in Article 5 parties; in 1995, for example, a total of non-Article 5 parties had produced 540 kilotonnes, while Article 5 parties had produced 54 kilotonnes. By 2010, production had been higher in Article 5 parties than in non-Article 5 parties for most HCFCs, e.g., for 2010 a total 320 versus 800 kilotonnes. From 2010 to 2014 the production of HCFC-141b, HCFC-142b and HCFC-22 was 1030 times higher in Article 5 parties than in non-Article 5 parties. HCFC consumption shows the same general trends as HCFC production, with Article 5 party consumption peaking and decreasing after 2012.

25. He said that 0.5 per cent of the non-Article 5 party HCFC baseline consumption (in ODP-tonnes) was defined as the "servicing tail" as of 2020. Refrigeration and air-conditioning HCFC-22 servicing in non-Article 5 parties was unlikely to require newly produced HCFC-22 during 2020–2030, although it was too soon to be certain. Recycled and reclaimed material from disposed of R/AC equipment could provide HCFC material during 2020–2030. He also said that the Panel could review HCFC quantities that would be required for R/AC servicing as well as the availability of alternatives for servicing. In fire protection, the servicing of the installed equipment using HCFC Blend B, which was mainly HCFC-123, might require 160 tonnes per year in non-Article 5 parties beginning in 2020. In niche solvent applications (e.g., aerospace and military), small quantities of HCFCs might be needed to service existing equipment. He said that with regard to R/AC and foams the Panel had not yet identified any potential essential uses after 2020. For fire protection, however, the Panel estimated that a volume of HCFC-123 not exceeding 750 tonnes could be needed annually. Furthermore, the Panel considered that essential-use exemptions could be needed for laboratory and analytical uses and for some solvent uses, with the total estimated in the tens of tonnes annually.

26. He said that, for the determination of HCFC production by non-Article 5 parties for basic domestic needs, the baselines used for Article 5 party production and consumption had been based on Article 7 data (i.e., the average for 2009–2010). He said that three methods had been applied to project HCFC consumption levels for 2020 and beyond, i.e., the extrapolation of Article 7 consumption data, the extrapolation of country programme data on the consumption of all HCFCs and the determination of the resulting consumption following HPMP stage I data for 2020. He presented a table showing production, consumption following the Montreal Protocol and extrapolation. Extrapolation of reported Article 5 party consumption data through 2020 showed that the expected (aggregated) HCFC consumption could be lower than the allowed HCFC production after 2020. Extrapolation over a

period of six years, however, led to significant uncertainties. He presented a second table also showing country programme data. Extrapolation of country programme data from 2009–2014 reported to the Multilateral Fund secretariat by Article 5 parties also showed that the expected aggregate HCFC consumption could be lower than the allowed HCFC production in 2020. The uncertainty in the extrapolated 2020 quantity was large. While presenting a third table, he said that consideration of all HPMP stage I data for HCFC consumption in all Multilateral Fund agreements drawn up for Article 5 parties provided a different way to look at 2020 HCFC consumption data, and it made it possible to state that the 2020 aggregated Article 5 party HCFC consumption could logically be expected to be lower than HCFC production allowed under the Protocol. He concluded by saying that no basic domestic needs production by non-Article 5 parties was likely to be needed for Article 5 parties after 2020.

Annex II

Text for consideration by the parties for inclusion in decisions under the Dubai pathway on hydrofluorocarbons under the Montreal Protocol on Substances that Deplete the Ozone Layer

Submission by India

Draft decision

The Meeting of the Parties,

Recognizing and recalling that the Montreal Protocol is a party-driven and party-guided process,

Recalling that the hallmark of the Protocol has been that the decisions of the Meeting of the Parties are based on scientific data and information on the one hand and on implementation after generating solutions through consensus on the other,

Noting that the success of the Protocol has generated interest among other institutions in emulating the processes and principles developed under the Protocol,

Noting also that the parties rely heavily on the excellent work and high standard of output of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol,

Noting further that the discussion on the proposals to amend the Protocol in respect of hydrofluorocarbons (HFCs) will be taken up after generating solutions for all identified challenges with a clear understanding that the reporting of emissions will continue under the United Nations Framework Convention on Climate Change,

Noting that, while generating solutions to challenges, the parties have directed a number of instructions and requests to the Executive Committee of the Multilateral Fund for the framing of guidelines on specific subjects, an indicative list of which is set out in the appendix to the present decision,

Noting that the parties have requested the Executive Committee to develop these guidelines within one year of the adoption of any HFC amendment,

Recalling that the Chair of the Executive Committee presents a report annually on the activities of the Executive Committee to the Meeting of the Parties and noting that the parties have proposed that the Chair of the Executive Committee report to the Meeting of the Parties on the progress made in accordance with decision XXVII/1, including on cases where Executive Committee deliberations have resulted in a change in the national strategy or the national technology choice submitted to the Executive Committee,

Observing that it will be important for the Executive Committee to take the guidance from the parties into account while finalizing the guidelines,

Decides:

1. That the draft guidelines developed by the Executive Committee shall be presented to the parties for their views and input;

2. That the guidelines shall be finalized by the Executive Committee only after incorporation of the views and input of the parties.

Appendix

Indicative list of subjects on which instructions and requests on the development of guidelines have been directed to the Executive Committee of the Multilateral Fund

Issue	*Instruction/Request to the Executive Committee*
Overarching principles and timelines	Executive Committee to develop guidelines incorporating the principle of flexibility Executive Committee to develop, within one year after the adoption of an HFC amendment, guidelines on financing the phasedown of HFC consumption and production, including cost-effectiveness thresholds.
Guidance to the Executive Committee on incremental costs	Executive Committee to develop new guidelines on methodologies and cost calculations for the consumption manufacturing sector, production sector and servicing sector
Energy efficiency	Executive Committee to develop cost guidance associated with maintaining and/or enhancing the energy efficiency of low-GWP or zero-GWP replacement technologies and equipment, when phasing down HFCs, while taking note of the role of other institutions addressing energy efficiency, when appropriate
Institutional strengthening	Executive Committee to increase institutional strengthening support in light of new commitments related to HFCs
Capacity-building to address safety	Executive Committee to prioritize technical assistance and capacity-building to address safety issues associated with low-GWP or zero-GWP alternatives

Annex III

Text for consideration by the Parties for inclusion in decisions related to the phase-down of hydrofluorocarbons under the Montreal Protocol on Substances that Deplete the Ozone Layer

Submission by Pakistan

[**Explanatory note:** The present conference room paper is submitted for discussion by the Parties to the Montreal Protocol at the thirty-eighth meeting of the Open-ended Working Group, and any agreed elements of the proposal should be included in any proposals adopted on the phase-down of HFCs.]

The Meeting of the Parties,

Noting that Pakistan supports a gradual global phase-down of the production and consumption of hydrofluorocarbons (HFCs),

Recognizing that certain replacements for ozone-depleting substances have high global warming potential, and that some HFCs in particular lead to warming of the environment,

Recognizing also that, while the share of the contribution of HFCs to overall global greenhouse emissions is, at this moment in time, less than 0.2 per cent and does not pose an immediate threat, and certain other sectors such as aviation and shipping have emissions multiple times higher than those from HFCs emissions, nevertheless the growth of HFC use from the decade before and after 2050 may affect the global climate,

Recognizing further that the majority of developing countries have no role in increasing or contributing to emissions contributing to global warming,

Recognizing the accepted principle of common but differentiated responsibilities and respective capabilities,

Recognizing that some enactments and obligations placed on developing countries may be inappropriate and of unwarranted economic and social cost to these countries,

Noting that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low, and that the share of global emissions originating in developing countries has to grow if their social and development needs are to be met,

Recognizing that the performance of technologies constituting alternatives to HFCs in countries with high ambient temperatures is comparatively poor, leading to higher energy requirements, and that in certain instances proven, advantageous and economical alternatives are not available,

Recognizing also that commercially viable solutions for vehicle air conditioners and some other sectors and applications are also not available, and that the recharging cost associated with alternative refrigerants would cause financial burdens in several low-income economies among the Article 5 countries,

Recognizing further that regulations, standards, policies and procedures have not been developed or adopted in Article 5 countries, especially in the context of the flammability and toxicity of the alternatives to HFCs,

Decides:

To set the phase-down target for the production and consumption of HFCs at 50 per cent of the agreed baseline, and that, for Article 5 countries, the phase-down shall, after reaching this target, be reviewed with respect to the availability of financially viable and technically proven alternate technologies.

Annex IV

Report by the Technology and Economic Assessment Panel on the climate benefits and costs of reducing hydrofluorocarbons under the Dubai pathway

Submission by Canada and the United States of America

Draft decision

The Parties decide:

To request that the Technology and Economic Assessment Panel prepare a report for consideration by the twenty-eighth Meeting of the Parties containing an assessment of the climate benefits, and the financial implications for the Multilateral Fund, of the schedules for phasing down the use of hydrofluorocarbons (HFCs) contained in the amendment proposals as discussed by the Parties at the thirty-eighth meeting of the Open-ended Working Group and the Third Extraordinary Meeting of the Parties.

Annex V

Text for consideration by the Parties for inclusion in decisions under the Dubai pathway on hydrofluorocarbons under the Montreal Protocol on Substances that Deplete the Ozone Layer

Submission by Pakistan

[**Explanatory note:** The present conference room paper is submitted for discussion by the Parties to the Montreal Protocol at the thirty-eighth meeting of the Open-ended Working Group, and any agreed elements of the proposal should be included in any related proposals adopted at the meeting.]

The Meeting of the Parties,

Recognizing that the rights and obligations of Parties as delineated under the United Nations Framework Convention on Climate Change should not be modified by the Montreal Protocol,

Noting that in principle the issue of hydrofluorocarbons lies within the ambit and mandate of the United Nations Framework Convention on Climate Change,

Noting also that in the outcome document of the resumed thirty-seventh meeting of the Open-ended Working Group of the Parties to the Montreal Protocol, the reporting of emissions of hydrofluorocarbons under the United Nations Framework Convention on Climate Change will continue,

Noting further that certain categories of cost elements under the Vienna solutions for challenges on funding issues and flexibility of implementation shall be taken up while negotiating the amendment and resolved prior to adoption of an amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer,

Noting that the Parties may identify other cost items to be added to the indicated list emanating as a result of conversion to low-GWP alternatives,

Decides:

That the additional costs associated with mitigation should be taken up by the Parties and resolved prior to adoption of an amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer.

Annex VI

Essential-use exemption for laboratory and analytical uses for 2017 in China

Submission by China

The Meeting of the Parties,

Noting with appreciation the work done by the Technology and Economic Assessment Panel and its Chemicals Technical Options Committee,

Recalling decision XI/15, by which the parties, among other things, eliminated the use of ozone-depleting substances for the testing of oil, grease and total petroleum hydrocarbons in water from the global exemption for laboratory and analytical uses,

Recalling also decision XXIII/6, by which parties operating under paragraph 1 of Article 5 of the Montreal Protocol were allowed until 31 December 2014 to deviate from the existing ban on the use of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water in individual cases where such parties considered doing so to be justified, and in which it was clarified that any deviation beyond that should take place only in accordance with an essential-use exemption in respect of the use of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water beyond 2014,

Noting that China has reported difficulty in implementing existing alternatives to the use of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water and has indicated that it needs more time for the revision and promotion of national standards, and also noting that the party is taking necessary measures to implement the alternatives and has expressed willingness to continue doing so,

Decides:

1. To encourage China, which has applied for an essential-use exemption for the use of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water, to complete the revision of its relevant national standard and to ensure that a revised national standard is brought into force as soon as possible with a view to ensuring a smooth transition to a method that does not use ozone-depleting substances;

2. To request that China, prior to submitting any further requests for essential-use exemptions for the use of ozone-depleting substances for the testing of oil, grease and total petroleum hydrocarbons in water, provide information on its evaluation of the use of other international analytical methods for such testing, on the national circumstances that make using them difficult, and on progress in the development of its own method and in the revision of the relevant national standard, as well as a timeline for the phase-out of carbon tetrachloride for laboratory and analytical uses, indicating the anticipated steps and dates in that process;

3. To authorize the level of consumption for China for 2017 necessary to satisfy essential uses of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water, as specified in the annex to the present decision.

Essential-use authorizations for 2017 for carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water

(Metric tons)

Party	*2017*
China	65

Annex VII

Terms of reference for the study on the 2018–2020 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol

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

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

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

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

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

(b) The need to allocate resources to enable all parties operating under paragraph 1 of Article 5 to maintain compliance with Articles 2A–2E, 2G, 2H and 2I of the Protocol; [to be further reviewed]

[(c) The need to allocate resources to enable all parties operating under paragraph 1 of Article 5 to meet [2020 and 2025] compliance obligations in respect of Articles 2F of the Protocol, [to be further reviewed] [providing [full] support for low GWP alternatives in HCFC phase-out and] taking into account [decision XIX/6 of the meeting of the Parties and] the extended commitment provided by parties operating under paragraph 1 of Article 5 under approved hydrochlorofluorocarbon phase-out management plans;]

[(d) Dividing the funding relating to the 2020 target applicable to hydrochlorofluorocarbon consumption and production in an appropriate manner, including, but not limited to, one scenario that divides the funding relating to the 2020 target applicable to hydrochlorofluorocarbon consumption equally between the [2015–2017 and 2018–2020] replenishments;]

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

[(f) The need to allocate sufficient resources [to] [commensurate with] the activities in the servicing sector in stage II [and stage III] of hydrochlorofluorocarbon phase-out management plans [and beyond] [up to 2020] through technical assistance such as recovery, training, [measures to manage controlled substances destruction projects,] [equipment support] and other necessary activities;]

3. [to be further reviewed] That, as a separate element to the funding requirement estimated in paragraph 2 of the present decision, the Panel should [provide][update] indicative figures for additional resources that would be needed to enable parties operating under paragraph 1 of Article 5 to gradually avoid high-global-warming-potential alternatives to ozone-depleting substances, taking into account the availability of safe, environmentally friendly, technically proven and economically viable technologies;

[3bis To provide information on key issues related to funding of an HFC phase-down being considered by the Parties;]

[Provide information on methodologies and cost calculations associated with expanding the list of eligible costs in the servicing sector when phasing down HFC;]

[Panel should provide indicative figures for additional resources that would be needed to enable parties not operating under paragraph 1 of Article 5 to gradually avoid high-global-warming-potential alternatives to ozone-depleting substances;]

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

5. That the Panel should strive to complete the report referred to above in good time to enable it to be distributed to all parties two months before the [XXX] meeting of the Open-ended Working Group;

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

Annex VIII

Draft proposal to establish regular consultations on safety standards

Submission by China

The Meeting of the Parties,

Recalling that parties recognize the importance of timely updating of international standards for flammable low-GWP refrigerants, including IEC 60335-2-40, and support promoting actions that allow safe market introduction as well as the manufacturing, operation, maintenance and handling of zero-GWP and low-GWP refrigerants that are alternatives to hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs),

Decides:

1. To establish regular consultations on international safety standards to make efforts to accelerate the revision of the relevant standards, and to contribute to a timely, technology-neutral update of relevant standards so as to enable safe use and market penetration of low-GWP alternatives required by relevant adjustment and/or amendment decisions adopted by the Meeting of the Parties to the Montreal Protocol, by coordinating with the relevant international standards bodies;

2. To request the Technology and Economic Assessment Panel to establish a task force on safety standards and submit a report to the thirty-ninth meeting of the Open-ended Working Group on the following:

(a) Progress in the revision of international safety standards by the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO) and other international standards bodies;

(b) Information concerning tests or assessments relevant to safety standards conducted by independent institutions; and

(c) The assessment of the implications of international standards for the implementation of the decisions of the Meeting of the Parties to the Montreal Protocol on accelerated phase-out of HCFCs and possible HFC control measures, and recommendations to the Parties on promoting actions;

3. To request that the Ozone Secretariat:

(a) Liaise with the relevant international standards bodies (IEC and ISO) and regional standards bodies (European Committee for Standardization (CEN), European Committee for Electrotechnical Standardization (CENELEC), etc.) to inform parties and to convey the concerns and expectations of the parties to the Montreal Protocol;

(b) Coordinate with national standards organizations of IEC to accelerate the revision of IEC 60335-2-40 and ensure that the requirements for the A2, A2L and A3 categories are revised synchronously using a fair, inclusive and scientifically sound approach;

(c) Provide information on subparagraphs 2 (b) and 2 (c) of the present decision to the international standards bodies for reference; and

(d) Organize a two-day workshop on the safety standards relevant to the safe use of low-GWP alternatives back to back with the thirty-ninth meeting of the Open-ended Working Group, subject to the availability of resources;

4. To encourage national authorities to take action in this area and invite parties to submit information on their domestic safety standards relevant to the use of low-GWP flammable refrigerants to the Ozone Secretariat by the end of 2016;

5. To encourage parties to take actions to strengthen connection and cooperation between national and regional standards committees and Montreal-Protocol-related national authorities;

6. To request the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol to consider maintaining or, if required, increasing the Fund's technical and capacity-building assistance, in particular through the Compliance Assistance Programme, with a view to improving cooperation between national authorities in charge of implementation of the Montreal Protocol and national and regional standards committees.