

**Montreal Protocol
on Substances that
Deplete the Ozone Layer**

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Open-ended Working Group of the Parties
to the Montreal Protocol on Substances
that Deplete the Ozone Layer
Forty-eighth meeting
Bangkok, 13–17 July 2026

**Report of the forty-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 forty-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 United Nations Conference Centre, Bangkok, from 13 to 17 July 2026. The meeting was co-chaired by Annie Gabriel (Australia) and Igobe Mbulawa (Botswana).
2. Ms. Mbulawa opened the meeting at 10 a.m. on Monday, 13 July 2026. Opening statements were delivered by Dechen Tsering, Director, Regional Office for Asia and the Pacific, United Nations Environment Programme (UNEP), and Megumi Seki, Executive Secretary, Ozone Secretariat.
3. Welcoming participants, Ms. Tsering said that the Montreal Protocol remained one of the most successful multilateral environmental agreements in history. Through science-based policymaking, international solidarity and sustained financial and technical support, the parties had achieved extraordinary results in protecting the ozone layer while delivering significant climate benefits. The Protocol continued to demonstrate that multilateral cooperation could produce measurable and lasting outcomes for people and the planet.
4. She observed that several of the issues due for consideration would help to shape the future direction of the Protocol, displaying a parallel with the broader reform efforts currently under way across the United Nations system to strengthen the effectiveness, efficiency and impact of the Organization. Both processes were guided by the common aim to preserve and strengthen successful institutions while adapting them to new realities. Although the Protocol faced many challenges, she was confident that the spirit of cooperation that had characterized the instrument throughout its history would continue to guide parties' deliberations during the current meeting.
5. In her statement, Ms. Seki recalled that, as had previously been indicated, Leila Akello Gonasa of Uganda, who had been elected as Co-Chair of the Open-Ended Working Group, was unable to attend the current meeting owing to travel restrictions. Following consultations with the Group of African States and other parties operating under paragraph 1 of Article 5 of the Protocol (Article 5 parties), Uganda had nominated Ms. Mbulawa of Botswana to replace her.

6. Summarizing the items for discussion at the current meeting, she said that the meeting would be suspended on Tuesday, 14 July to enable the Sixth Extraordinary Meeting of the Parties to convene in order to decide on the membership of the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol. Given that two nominations had been received from among the Eastern European States, a vote might be necessary to decide which member was to be elected. Such a vote would represent the first time in the 40-year history of the Montreal Protocol that consensus among the parties could not be found. She expressed the hope that parties would continue to engage in informal consultations to seek compromise.

7. She drew attention to the report of the Technology and Economic Assessment Panel on the 2027–2029 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol, for which estimates ranged from \$1.2 billion to \$1.7 billion. She expressed the hope that the calculation tool developed by the Panel's task force, with support from the Secretariat, to facilitate the calculation of the replenishment on the basis of various scenarios and assumptions would prove helpful in making the process more transparent and accessible to the parties.

8. On atmospheric monitoring, the Advisory Committee of the Vienna Convention Trust Fund for Research and Systematic Observation and the Secretariat had made progress in identifying suitable sites for the establishment of monitoring stations and had initiated informal consultations with the relevant parties. The Executive Committee of the Multilateral Fund and the Fund secretariat had advanced preparations for the implementation of pilot monitoring projects. To further support parties' efforts, the Ozone Secretariat was developing a practical cost estimation tool reflecting national circumstances, local market conditions, existing infrastructure and operational requirements in order to generate more accurate and country-specific estimates.

9. On the viability of Montreal Protocol operations, as requested by the parties the Secretariat had prepared a document on the options for making effective and efficient changes, with associated cost estimates. She highlighted the finding that if business continued as usual with an expenditure rate of 85 per cent, and if 75 per cent of contributions to the Montreal Protocol Trust Fund were received, cash balances would drop below the required level of the cash reserves by 2031, and the Secretariat would be unable to operate in support of the parties and the Montreal Protocol. It was to be hoped that parties would find ways to safeguard the operation and effectiveness of the ozone treaties.

10. Other issues on the agenda included the progress reports of the Technology and Economic Assessment Panel and its technical options committees and an update from Rwanda on the status of the plans, preparations and vision for the Thirty-Eighth Meeting of the Parties, which would include a celebration of the tenth anniversary of the Kigali Amendment to the Protocol. She encouraged the 25 parties which had not yet ratified the Kigali Amendment to do so to enable the anniversary to be celebrated with full global unity.

11. Subsequently, one representative, noting that he had asked for the floor on the issue of the appointment of Ms. Mbulawa to replace Ms. Gonasa, sought clarification of the appointment process. He observed that, in accordance with rule 26 of the rules of procedure for meetings of the parties to the Montreal Protocol, the Open-ended Working Group appointed its co-chairs; neither the Secretariat nor the individual originally elected could decide on a replacement. He said that, while he had no objection to Ms. Mbulawa's appointment, clarification of the procedure was important for the future.

12. Accordingly, the Open-ended Working Group elected Ms. Mbulawa to the position of Co-Chair of the Working Group.

II. Organizational matters

A. Attendance

13. The following parties to the Montreal Protocol were represented: Albania, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Cook Islands, Costa Rica, Côte d'Ivoire, Cuba, Cyprus, Czechia, Democratic People's Republic of Korea, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador,

Estonia, Eswatini, European Union, Fiji, Finland, France, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea-Bissau, Haiti, Honduras, India, Indonesia, Iran (Islamic Republic of), Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Maldives, Mauritania, Mauritius, Mexico, Micronesia (Federated States of), Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Netherlands (Kingdom of the), New Zealand, Nicaragua, Nigeria, Niue, North Macedonia, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Republic of Moldova, Russian Federation, Rwanda, Saint Kitts and Nevis, Saint Lucia, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Slovakia, Solomon Islands, Somalia, South Africa, South Sudan, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Türkiye, Turkmenistan, Tuvalu, Ukraine, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Uruguay, Uzbekistan, Vanuatu, Viet Nam, Yemen, Zambia and Zimbabwe.

14. The following United Nations entities, organizations and specialized agencies were represented: International Civil Aviation Organization; secretariat of the Basel, Rotterdam and Stockholm conventions; secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol; United Nations Development Programme; United Nations Environment Programme; United Nations Industrial Development Organization; World Bank and World Meteorological Organization. The Montreal Protocol assessment panels were also represented.

15. The following intergovernmental, non-governmental, industry, academic and other bodies were represented as observers: A-Gas International; Alliance for Responsible Atmospheric Policy; ASEAN Centre for Energy; Associação Brasileira de Refrigeração, Ar Condicionado, Ventilação e Aquecimento; Association des Distributeurs, Conditionneurs, Récupérateurs et Retraiteurs de Réfrigérants; ATMosphere; Carbon Containment Lab; Carrier Corporation; Cascade Climate; Center for Shared Responsibility and Technology Ambition; Centre for Environment Justice and Development; China Automotive Technology and Research Center; Collaborative Labeling and Appliance Standards Program; Daikin; Danfoss A/S (Denmark); Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH; Environmental Investigation Agency; European Association of Refrigeration and Air Conditioning Installers; European Partnership for Energy and the Environment; Frostchem Global FZE; Glencoe Strategies LLC; Global Policy Associates; Green TERRE Foundation; Guidehouse Germany GmbH; Gujarat Fluorochemicals Limited; Gulf Cooperation Council; ICF International; iFOREST; Institute for Energy and Climate Strategies; Institute for Global Decarbonization Progress; Institute for Governance and Sustainable Development; International Coordinating Council of Aerospace Industries Associations; International Energy Initiative; International Institute of Refrigeration; Japan Refrigerant Environment Conservation Organization; Japan Refrigeration and Air Conditioning Industry Association; Kulthorn Group; Labtech International Ltd.; Lehigh University; Leiden University; Mebrom Corporation; Natural Resources Defense Council; Orbia Fluor and Energy Materials; Ökorecherche; Overseas Environmental Cooperation Center; Recoolit; Refrigerant Reclaim Australia; Refrigerants Australia; SilverLining; Solutions for Our Climate; SRADeV; SRF Limited; The Energy Commission; and Tradewater. An independent expert also attended the meeting.

B. Adoption of the agenda

16. Introducing the provisional agenda contained in document UNEP/OzL.Pro.WG.1/48/1, the Co-Chair invited representatives to propose any additional matters they might wish to discuss at the current meeting under sub-item 4 (e), “Any other issues”, for those specific to the Technology and Economic Assessment Panel, or item 9, “Other matters”.

17. One representative proposed the addition to sub-item 4 (e) of discussion of the evaluation of a destruction technology his party had submitted to the Technology and Economic Assessment Panel.

18. A number of representatives requested the inclusion of an item to discuss the composition of the Group of Eastern European States under item 9, observing that a conference room paper with a draft proposal would be submitted. Another representative, speaking on behalf of a group of parties, expressed the view that the current meeting was not a suitable forum

for discussing the issue and said that he would make that point when the topic was discussed later in the meeting.

19. Another representative requested the addition of an item to discuss the impact of nitrous oxide on the ozone layer, given that emissions of the substance were now equivalent to emissions of all controlled ozone-depleting substances combined. Although nitrous oxide had been listed in Annex I to the Vienna Convention for the Protection of the Ozone Layer, it was still not controlled under the Montreal Protocol. He said that he would be submitting a conference room paper containing a draft proposal requesting more information from the Scientific Assessment Panel and the Technology and Economic Assessment Panel to facilitate understanding of emissions and mitigation options.

20. Another representative requested the addition of an item on the implementation of paragraphs 2 and 4 of Article 2J of the Montreal Protocol in respect of Azerbaijan. An informal note prepared by Azerbaijan that was aimed at facilitating understanding of the proposal was set out in the annex to document UNEP/OzL.Pro.WG.1/48/2/Add.2.

21. The Working Group adopted the following agenda on the basis of the provisional agenda set out in document UNEP/OzL.Pro.WG.1/48/1:

1. Opening of the meeting.
2. Organizational matters:
 - (a) Adoption of the agenda;
 - (b) Organization of work.
3. Report of the Technology and Economic Assessment Panel on the 2027–2029 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (decision XXXVII/6).
4. Presentations by the Technology and Economic Assessment Panel on its 2026 progress report and discussions on:
 - (a) Halon 1301 and its continuing use in the aviation industry; management of other controlled substances used for fire suppression (decision XXXVII/4);
 - (b) Metered-dose inhalers with low-global-warming-potential propellants (decision XXXVI/6);
 - (c) Options for the organization of the Panel and its technical options committees (decision XXXV/20);
 - (d) Changes in the membership of the Panel;
 - (e) Any other issues.
5. Enhancing regional atmospheric monitoring of substances controlled by the Montreal Protocol (decision XXXVII/1).
6. Ensuring the viability of Montreal Protocol operations (decision XXXVII/7).
7. Further strengthening Montreal Protocol institutions (UNEP/OzL.Pro.37/9, para. 166).
8. Status of preparations for the Thirty-Eighth Meeting of the Parties, to be held in Kigali.
9. Other matters.
10. Adoption of the report of the meeting.
11. Closure of the meeting.

22. Under agenda sub-item 4 (e), “Any other issues”, the Working Group agreed to consider the evaluation of a destruction technology.

23. Under agenda item 9, “Other matters”, the Working Group agreed to consider three sub-items: participation of the Central Asian States in the Group of Eastern European States;

nitrous oxide; and the implementation of paragraphs 2 and 4 of Article 2J of the Montreal Protocol in respect of Azerbaijan.

C. Organization of work

24. The Working Group agreed to the organization of work proposed by the Co-Chair, namely to establish contact and informal groups as necessary and to avoid, to the extent possible, the holding of contact or informal group meetings in parallel with each other or with plenary meetings. Morning plenary sessions would run from 10 a.m. to 1 p.m. and afternoon sessions from 3 to 6 p.m.

III. Report of the Technology and Economic Assessment Panel on the 2027–2029 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (decision XXXVII/6)

25. Introducing the item, the Co-Chair recalled that, pursuant to decision XXXVII/6, the Technology and Economic Assessment Panel had established a task force to prepare a report on the funding requirements for the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the period 2027–2029. The replenishment report had been available on the meeting portal since mid-May 2026. A summary of the task force report was set out in an addendum to the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group of the Parties to the Montreal Protocol at its forty-eighth meeting (UNEP/OzL.Pro.WG.1/48/2/Add.1, paras. 4–21), while the full executive summary was set out in annex I thereto. Thanking the Panel and its task force for their hard work and dedication, she invited the task force to present its report.

A. Presentation

26. The report was presented by Bella Maranion and Suely Carvalho, co-chairs of the Technology and Economic Assessment Panel task force, and Bassam Elassaad and Omar Abdelaziz, members of the task force. A summary of the presentation is set out in annex III to the present report, without formal editing.

B. Question-and-answer session

27. In the ensuing question-and-answer session, Ms. Carvalho and Mr. Abdelaziz noted that the task force's replenishment calculations responded to the terms of reference for the task force, which had stipulated the use of a compliance model. The calculations also included costs related to issues addressed in past Executive Committee decisions, such as on low-volume-consuming countries, energy efficiency and a funding window for pilot projects on atmospheric monitoring of controlled substances. However, some issues that did not relate to compliance, such as digitalization, life-cycle refrigerant management and energy efficiency, had nevertheless been deemed important by the task force and had been addressed separately in the report. Project management costs had not been included in the calculation given the variation in approved amounts. Nothing precluded any of the above-mentioned issues being considered in the supplementary report if the Working Group so wished, and Ms. Maranion said that the task force would welcome guidance from parties on how to do that.

28. Under the compliance model, the task force had been required to follow the Executive Committee decisions that were related to the cost framework applied to low-volume-consuming countries. Although a review of the cost guidelines was foreseen for stage II of the Kigali hydrofluorocarbon (HFC) implementation plans in 2028, the task force had not attempted to forecast the changes that might be made and the impact that they might have. Ms. Carvalho said that in its report the task force had tried to show that the funding levels would not be sufficient for low-volume-consuming countries because the fixed costs and training costs accounted for the majority of the funding available. As a result, there was insufficient funding for other activities, such as demonstration projects and further capacity-building activities. One representative expressed his party's intention to submit a conference room paper on the matter of the increased costs faced by low-volume-consuming countries and the problems analysed in chapter 6 of the task force report. Ms. Carvalho proposed a bilateral discussion with the representative who wished to know more about the consideration of vulnerability in the compliance model.

29. In following a compliance model, the task force had understood that it was supposed to calculate target reductions using the HFC baseline, including the hydrochlorofluorocarbon (HCFC) consumption component, rather than actual consumption. Ms. Carvalho and Ms. Maranion both said that the task force would appreciate guidance on how to take a different approach in the supplementary report.

30. In response to a concern that Article 5, group 1, parties would not have sufficient funding to carry out stage I of their Kigali implementation plans, Ms. Carvalho recalled that the task force had estimated the funding needed over the course of three trienniums. The proportion of that total funding allocated to each triennium could be adjusted upon request by the parties and with guidance as to how that was to be done.

31. The task force had used the figure of 15 per cent as the percentage deduction for ineligible, foreign-owned enterprises, as that was the figure used in previous replenishment reports. The task force had consulted the Multilateral Fund secretariat with a view to finding a more appropriate percentage, but insufficient data had hindered the process. The Multilateral Fund secretariat considered 15 per cent to be a reasonable number for use as an assumption.

32. With regard to a query about the number of parties that had yet to ratify the Kigali Amendment, Ms. Carvalho said that, as at 8 April 2026, a total of 19 Article 5 parties had not yet ratified the instrument. She noted that the updated figure would be checked. In response to a request for more information about the ratification outlook for those parties, Ms. Maranion said that the task force might have been too optimistic in its projection that all parties would ratify the Amendment by the end of the next triennium, making them eligible for funding. That projection could be reconsidered.

33. Regarding whether regional cooperation was better than individual support for certain groups, including low-volume-consuming countries, Mr. Elassaad explained that discussions on regional centres, regional testing centres and centres of excellence were ongoing in the Executive Committee. If there was anything to add on the subject, it would be included in the supplementary report.

34. Mr. Abdelaziz confirmed that training on safety and flammability issues related to certain alternatives to HFCs was included in the HCFC phase-out management plans and Kigali implementation plans when such alternatives were chosen by a party, and that activities under those plans were taken into account in the compliance model.

35. With regard to the use of historical cost-effectiveness thresholds for the manufacturing sectors in one scenario and the use of cost-effectiveness thresholds through the HCFC cost guidelines in another scenario, the task force acknowledged that those two approaches might not have been sufficiently different and had elaborated on that matter in annex 2L to its report.

36. The task force had considered using HCFC cost-effectiveness figures as a proxy for HFC conversions but had abandoned the idea because available data, although limited, had shown higher costs for HFCs depending on the technology used. As the Executive Committee continued to fund more Kigali implementation plans, additional data would become available.

37. Regarding a suggestion that a different approach to cost-effectiveness be taken in relation to the largest-volume-consuming party, Ms. Carvalho said that the task force did not have the resources needed to conduct research in large numbers of databases so it had looked at publicly available documents. Using limited information, it had tried to establish a value that could be applied to all parties. Guidance would be required in the task force's terms of reference were it to be asked to take a different approach based on the actual funding received in recent years.

38. Mr. Elassaad, responding to a question about the application to stage II of the cost-effectiveness values used in stage I, said that the task force had not considered any other approach.

39. In response to a question about how the funding scenarios aligned with real-world disbursement schedules and parties' cash flow needs, Ms. Carvalho and Ms. Maranion both said that the task force had tried to link the methodology used in previous replenishment reports more closely to the project cycle, cash-flow requirements and the functioning of the Executive Committee so as to make it more familiar to parties and thus easier to understand.

40. Ms. Maranion confirmed that members of the task force had attended the ninety-eighth meeting of the Executive Committee and were eager to update the task force analysis on the basis of the new developments.

41. In response to a question about the grouping of parties by the task force in the report in comparison with the approach in the report for the triennium 2024–2026, Ms. Maranion said that the task force considered the two approaches to be similar, both grouping parties according to their consumption profiles.

42. Mr. Elassaad said that the task force had not considered certification, licensing, safety standards and access to appropriate tools and equipment as part of the training costs. The information on training had been extracted from Kigali implementation plans submitted to the Multilateral Fund secretariat. Where the project had included more than just training, the task force had tried to extract the information relating solely to training. The task force's approach could be improved in the supplementary report by breaking the information down further and including the other activities.

43. In response to a question about the discrepancy between the estimate of needs for the triennium 2027–2029 in the previous replenishment report and the estimate in the new replenishment report, Ms. Carvalho explained that the methodology used in the past had been different and only an indicative figure had been given for the triennium 2027–2029. Given that there was now a clear compliance period over three trienniums, the actual replenishment figure for the triennium 2027–2029 would depend on how parties wished to divide the total projected funding needs over the three cycles.

44. Other questions posed by individual representatives related to why there were not even more scenarios in the report; the accuracy of the HCFC cost estimates; why the task force had estimated additional HFC-23 by-product mitigation costs in two countries that did not have approved projects under the Multilateral Fund; and whether the task force had evaluated the methodology used for the new replenishment report, including through a comparison of the projected needs under the previous replenishment and the actual spending from the Multilateral Fund.

C. Discussion

45. In the ensuing discussion, many representatives acknowledged with appreciation the efforts of the Panel and its replenishment task force in preparing the report on the upcoming replenishment. Most affirmed that the purpose of replenishment was to ensure full compliance with the Montreal Protocol and its Kigali Amendment, and several recognized the central role played by the Multilateral Fund in the Protocol's success to date.

46. Many representatives reaffirmed their commitment to supporting the Multilateral Fund as an integral part of the Montreal Protocol infrastructure that supported Article 5 parties in meeting their compliance targets, including under the Kigali Amendment. One representative, speaking on behalf of a group of parties, nevertheless recalled that funding under the Multilateral Fund was intended for compliance-related activities, while another reiterated that statement, adding that his country also supported providing funding from the Multilateral Fund to help Article 5 parties to address issues that were related to, but not strictly needed for, compliance, where there was agreement from the parties and the Executive Committee to address such issues.

47. Many representatives, including one speaking on behalf of a group of parties, raised concerns regarding the methodologies used by the replenishment task force in estimating the funding required for the triennium 2027–2029. While they all expressed agreement that the replenishment level should reflect the actual needs of Article 5 parties, their views on the accuracy of the estimates diverged.

48. Some representatives said that the range of estimates significantly exceeded any realistic amount. Noting the importance of a pragmatic approach in ensuring the credibility of the Multilateral Fund, they underscored the need for additional analysis, in particular to include scenarios that were based on actual consumption levels of controlled substances by Article 5 parties rather than the maximum allowable consumption levels, which tended to be much higher. Several representatives, including one speaking on behalf of a group of parties, recommended that the task force use the data in the Kigali implementation plans to improve the accuracy of its HFC consumption estimates, and several others recommended applying the Multilateral Fund's

experience and knowledge of transitioning to lower-global-warming-potential (lower-GWP) alternatives in all key manufacturing sectors. One representative pointed out that it was unrealistic to assume that the HFC phase-down could be achieved sooner than required under the Kigali Amendment given the length of time needed to draft and approve Kigali implementation plans. Some representatives also noted the importance of considering cost-effectiveness values.

49. Several representatives, including one speaking on behalf of a group of parties, stressed their desire to avoid a repeat of the triennium 2024–2026 replenishment, which in the end had far exceeded the amount actually requested. One pointed out that realistic estimates were especially important at a time of national budget constraints, and another suggested that replenishment estimates had been more accurate in the past and advocated a return to that greater accuracy. One representative stressed that a pragmatic approach was an attempt not to limit the ambition of the Multilateral Fund but rather to ensure support for all parties that was credible, sustainable, transparent and fit for purpose.

50. Many representatives voiced the concern that the replenishment estimates failed to account for all the challenges that they would face in attempting to comply with their commitments. A number of them recalled that the 2027–2029 replenishment period was one in which the completion of HCFC phase-out activities would run concurrently with the implementation of the Kigali Amendment. One representative also drew attention to the concurrent implementation challenges presented by the global backdrop of geopolitical instability, supply chain disruptions, and rising manufacturing and transportation costs. Many representatives stressed their country's need for adequate, sustainable and predictable funding. Digital technologies, life-cycle refrigerant management, institutional strengthening and capacity-building were all flagged by several representatives as important elements to be accounted for in the funding estimates, as was the strengthening of the services sector, including technician training and certification. One representative recalled that the replenishment estimate was calculated as a global figure and recommended that parties avoid focusing too much on minutiae.

51. A number of representatives, including one speaking on behalf of a group of parties, highlighted elements that they hoped to see addressed in the supplementary report to be prepared by the task force. Their suggestions included additional scenarios based on actual HFC and HCFC consumption; a comparison between the average funding rate received by each Article 5, Group 1, party in the past five years and the funding estimates in the report; funding to address the disproportionate burden of low-volume-consuming and very-low-volume-consuming countries; and specific funding provisions for digitalization and refrigerant life-cycle management.

52. A number of representatives welcomed the recognition in the report of the disproportionate burden borne by low-volume-consuming and very-low-volume-consuming countries owing to the fixed cost of system-building activities, although several noted that the current funding model failed to take that additional burden into account. One representative, adding that such countries were further disadvantaged by the reluctance of suppliers to supply small quantities of equipment that used alternative refrigerants, said that his delegation intended to submit a conference room paper on the matter at the Thirty-Eighth Meeting of the Parties requesting the Executive Committee to incorporate the conclusions in chapter 6 of the replenishment task force report into the 2028 review of the cost guidelines. His delegation had also prepared a document for consideration by the Executive Committee at its 100th meeting, in June 2027, to support further discussion of the matter.

53. One representative, speaking on behalf of a group of parties and echoed by another representative, recalled that, pursuant to Article 10, paragraph 6, of the Montreal Protocol, the Multilateral Fund was to be financed by contributions from parties not operating under paragraph 1 of Article 5 (non-Article 5 parties) and contributions by other parties were to be encouraged. Another representative urged parties in a position to do so to contribute to the Fund.

54. Many representatives expressed their willingness to discuss the matter further in a contact group. Elements proposed by representatives for further discussion included the assumptions underlying the estimates; the proposed resource allocations; additional scenarios; large cost estimates in situations where consumption was far below the allowable level; the proposed deferral of funding for Article 5, group 2, parties; the lack of specific funding provision for digital technologies, life-cycle refrigerant management and project management

units; the reliance on conservative assumptions; and the use of a uniform 15 per cent discount assumption.

55. The Working Group agreed to establish a contact group, to be co-chaired by Miruza Mohamed (Maldives) and Ralph Brieskorn (Kingdom of the Netherlands), to develop additional guidance to the Panel for its supplementary report on the funding requirement for the replenishment of the Multilateral Fund for the period 2027–2029.

56. Subsequently, the representative of Cuba introduced a draft decision set out in a conference room paper. He said that the report by the replenishment task force confirmed that low-volume-consuming countries and very-low-volume-consuming countries faced challenges in meeting their obligations under the Kigali Amendment and that their implementation costs were not proportional to their consumption or to the financing that they received. In addition to requesting the Executive Committee of the Multilateral Fund to incorporate the conclusions of chapter 6 of the report into its 2028 review of the cost guidelines, the draft decision requested the preparation of a document, for review by the Executive Committee at its first meeting of 2027 – its 100th meeting – that summarized the challenges faced by low-volume-consuming and very-low-volume-consuming countries in meeting their HFC phase-down obligations; identified the preparatory activities that could be carried out to support the development of stage II of HFC phase-down management plans for those countries; and presented potential funding methodologies, including possible enhanced support levels to address the distinct and immediate needs of low-volume-consuming and very-low-volume-consuming countries in preparing for stage II of their Kigali HFC implementation plans.

57. All the representatives who took the floor were supportive of the intention of the draft decision, namely to help struggling low-volume-consuming and very-low-volume-consuming countries to meet their obligations under the Kigali Amendment. One representative confirmed, from personal experience, the assertions that costs were not proportional to consumption or in line with financing and that Article 5 parties, especially low-volume-consuming and very-low-volume-consuming countries, required increased financing and continuous capacity-building. Some representatives supported the draft decision as it had been presented by Cuba, while others raised procedural concerns, saying that the purpose of the task force report was to enable the parties to adopt a decision on the level of the replenishment of the Multilateral Fund for the triennium 2027–2029, in accordance with the terms of reference approved by the Thirty-Seventh Meeting of the Parties. The Open-ended Working Group therefore needed to request the task force to look at specific additional issues in its supplementary report to enable the Thirty-Eighth Meeting of the Parties to adopt a replenishment decision; a request to the Executive Committee was not within the scope of that mandate. One representative recalled that the Executive Committee already had a special funding modality for low-volume-consuming and very-low-volume-consuming countries as opposed to applying the standard methodology on cost-effectiveness to them.

58. One representative said that the very need for a request to the Executive Committee and the type of any request would in any case be dependent on the outcome of the discussions in the contact group. He therefore suggested that the representative of Cuba and other interested parties seek to engage in the existing process to provide guidance to the replenishment task force to ensure that their concerns were addressed. Other representatives pointed out that the proposed preparation of a report for the Executive Committee and the 2028 review of the funding guidelines would take place only after a decision on the replenishment had been taken.

59. One representative, seeking to move forward with a draft decision, sought an opportunity to introduce some textual changes and suggested that the draft decision be considered in the contact group set up to discuss guidance to the replenishment task force. Another representative stressed that the report for the Executive Committee requested in the draft decision would ensure that the Executive Committee was in possession of comprehensive data and was well informed when undertaking its review of the funding guidelines in 2028, and in no way prejudged the outcome of the review.

60. Although there was no agreement to forward the draft decision to the Thirty-Eighth Meeting of the Parties, the Working Group agreed that the representative of Cuba would engage in informal consultations with interested parties in the margins of the meeting to clarify the way forward and report back to the Working Group later in the meeting. The Co-Chair urged interested parties to work in the replenishment contact group to incorporate the principles and

the ideas in the draft decision into the guidance for the task force for the preparation of its supplementary report.

61. Subsequently, the Co-Chair said that, in the absence of representatives of Cuba in the meeting room to report on the outcomes of the informal consultations, it was assumed that the informal discussions undertaken by Cuba had not culminated in support for forwarding that party's draft decision for further consideration by the Thirty-Eighth Meeting of the Parties.

62. The co-chair of the contact group then reported back on the work of the contact group, saying that the group had succeeded in reaching agreement on suggestions for additional analysis in a supplementary report on the replenishment. The Working Group agreed that the text of the suggestions would be included in an annex to the present report, to be used by the Panel's replenishment task force in producing its supplementary report for consideration by the Thirty-Eighth Meeting of the Parties.

63. The suggestions for additional analysis in a supplementary report on the Multilateral Fund replenishment for the period 2027–2029 are set out in section A of annex II to the present report, without formal editing.

IV. Presentations by the Technology and Economic Assessment Panel on its 2026 progress report and discussions on

64. Introducing the item, the Co-Chair drew attention to volume 1 of the Technology and Economic Assessment Panel 2026 progress report and to the summaries of the issues set out in the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group of the Parties to the Montreal Protocol at its forty-eighth meeting (UNEP/OzL.Pro.WG.1/48/2, paras. 10–25) and an addendum thereto (UNEP/OzL.Pro.WG.1/48/2/Add.1, paras. 22–82 and annexes II–IV).

1. Presentation

65. Following an introduction by Marta Pizano, co-chair of the Panel, members of the Panel and its technical options committees summarized the findings of the Panel's 2026 progress report, including its responses to relevant decisions of the Meeting of the Parties, as follows: Dan Verdonik – Fire Suppression Technical Options Committee; Helen Walter-Terrinoni – Flexible and Rigid Foams Technical Options Committee; Ian Porter – Methyl Bromide Technical Options Committee; Helen Tope – Medical and Chemicals Technical Options Committee; Rajan Rajendran – Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. Ashley Woodcock, co-chair of the Panel, then summarized findings on per- and polyfluoroalkyl substances (PFAS), and Ms. Pizano summarized procedural and organizational challenges facing the Panel and also presented the Panel's preferred options for the future organization of its technical options committees. A summary of the presentation is set out in annex IV to the present report, without formal editing.

2. Question-and-answer session

66. In the ensuing question-and-answer session, many representatives had specific questions on the presentation.

67. All the representatives who spoke thanked the Technology and Economic Assessment Panel and its technical options committees for their work.

68. Responding to questions to the Flexible and Rigid Foams Technical Options Committee, Ms. Walter-Terrinoni said that good progress had been made in the range of alternative foam-blowing agents available, although it was worth noting that the situation was not identical for all parties. There had been no recent changes in the types of chemicals used in the alternatives but changes had been seen in the blends being used, including the addition of water and carbon dioxide in efforts to reduce costs.

69. There had been an increase in the production and availability of alternative foam-blowing agents with low GWP, although she recognized that some countries might currently only have access to a single supplier of such alternatives, and more detail would be provided in future reports in that regard.

70. The Committee was continuing to monitor the discrepancy between the modelled and observed data on HCFC-141b. The hypotheses for the discrepancy included changing uses for the chemical, possibly as an equipment cleaner or a solvent, its use in more emissive types of foam, or an increase in production or emission levels that was not yet understood.
71. With regard to alternatives to HCFC-141b, given that supply of the chemical was due to cease in 2026 apart from that from existing stockpiles, she noted that some use of HFC-254fa had been recorded but that overall there had been a move away from the use of HCFCs.
72. With regard to the use of foam-blowing agents for insulation, while it was true that the thermal properties of alternatives to HCFCs were not as good as those of HCFCs, that could be rectified in some cases by using a thicker layer of the agent. The lack of thermal properties should also be considered a trade-off against other advantages, which included cost-effectiveness.
73. A representative speaking on behalf of a group of parties said that those parties, for example, used policies on indirect emissions, such as eco-design and labelling, to counteract any effects there might be if direct emissions were being reduced.
74. He clarified that the ban in the European Union from 2033 onwards on fluorinated gas (F-gas) blowing agents, apart from where required for safety reasons, was not just a potential ban, as had been stated in section 2.2.3 of volume 1 of the progress report, but was in fact already enshrined in legislation.
75. He also asked the Panel to clarify how existing regulatory measures were reflected in future technology pathways and market transition in the foam sector.
76. In response to a question on pre-blended polyols containing HFCs, Ms. Walter-Terrinoni said that those substances were considered as a distinct group by the Committee but that there were limited amounts of import and export data available, given that the reporting of those substances was not required under Article 7 of the Montreal Protocol. It was therefore possible that the volume of trade in the substances was being underreported. She added that the Committee also considered other information on the substances, such as cost.
77. Responding to questions to the Fire Suppression Technical Options Committee, Adam Chattaway confirmed that a single type certificate for the fire suppression system in aircraft could remain in place, effectively, for up to 50 years; although aircraft manufacturers would typically create variants of the original design, they would all still be covered by the same certificate. Under its resolution A42-11 on halon replacement, the International Civil Aviation Organization (ICAO) required alternatives to halon 1301 in cargo compartments to be used in completely new aircraft designs submitted after 2024 but, to the best knowledge of the Committee, no new type certificates had been issued since 2024.
78. In response to queries from several representatives, Mr. Chattaway clarified that the maps of Europe showing the location of maintenance, repair and overhaul entities of the aviation industry and of hotspots of halon 1301 emissions had been included in the Committee's presentation as an example of the analysis that could be carried out with sufficient real-time data on emissions. The Committee had been able to compile the map of hotspots in Europe thanks to emissions data provided by the University of Bristol and was working with the Scientific Assessment Panel and other bodies to obtain the relevant data from other regions. With more accurate regional monitoring of halon emissions, it would also be possible to link those emissions to a specific industry or sector activity. He noted, however, that the data were not straightforward to obtain and would not be available in time for the Committee's next progress report.
79. Responding to a question on the fire suppression options available for data centres, he said that the Committee could only provide an overview, as the detailed information was the proprietary information of the suppression companies. HFCs, most commonly HFC-227ea and HFC-124, and the fluoroketone FK-5-1-12 were still used, and it was likely that inert gas systems were also used, in particular in Europe.
80. In response to a question on halon destruction methodologies, he said that the Committee was not aware of any new projects in that regard in 2026 under the American Carbon Registry. He also noted that halon could be reprocessed with purification specifications as low as 90 per cent, depending on the nature of the contaminants present. If those contaminants had a

significantly different boiling point than that of halon, they could easily be separated through fractional distillation.

81. Mr. Verdonik responded to a question on the run-out date scenarios for halon 1301 set out in table 3.5 of the progress report by clarifying that the scenarios were based on information provided by ICAO on 2025 figures for the amount of halon 1301 currently installed on aircraft and on anticipated growth rates for the global fleet. The Committee had then applied other variables, including consideration of sectors other than aviation. Some data gaps remained, as did some uncertainty over the calculation of estimated future emission rates, but the Committee intended to develop the scenarios further in its upcoming quadrennial assessment report, including by incorporating a scenario that would take into account the phase-out of halon 1301 use in aviation in the European Union.

82. In response to a question on 3,3,3-trifluoro-2-bromo-propene (2-BTP) as an alternative to halon 1301 on aircraft, he said that if the use of 2-BTP was approved for new and retrofitted aircraft types, that would make more halon 1301 available to support the needs of existing aircraft and ensure their airworthiness under ICAO rules. The Committee's understanding was, however, that the aviation industry and ICAO were unwilling to commit to 2-BTP as an alternative, given the need for long-term viability in the aviation industry, even if government and environmental bodies approved 2-BTP for use. The aviation industry was focused on reducing aircraft emissions rather than on exploring alternatives to halon 1301 and he therefore underscored the crucial importance of improved emissions monitoring data for halon 1301.

83. He noted that the progress report incorrectly stated that the blend of 2-BTP and carbon dioxide had been approved under the Significant New Alternatives Policy of the United States of America and that the regulatory process was ongoing.

84. Regarding the issue of the uneven distribution of halon 1301 banks globally, he recalled that the issue had been raised in many of the Committee's reports but that the possibility of further analysis thereof was hampered by the lack of data disaggregated to the regional or country levels. There were companies that specialized in the reprocessing and sale of halon 1301 at the international level but there could be issues relating to transboundary movements of halon 1301 under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal and under local regulations.

85. Responding to a question to the Methyl Bromide Technical Options Committee on non-chemical and emerging chemical alternatives for pest control, given the strict health and safety restrictions in some countries on alternatives such as sulfuryl fluoride and phosphine, Ms. Pizano said that, although the selection of a suitable alternative depended heavily on the pest involved and the specific circumstances of the application, effective non-chemical alternatives included heat or cold treatment and irradiation. The Committee would be happy to provide specific information to parties upon request.

86. With regard to the significant sharp decline in methyl bromide consumption in New Zealand, Mr. Porter noted that it had been achieved through the application of emissions policies at the national level, under which a stepwise approach was being taken to reduce emissions to close to zero by 2032. In order to achieve the targets, industries in New Zealand had implemented recapture processes for a range of emissions which had, in turn, reduced emissions of methyl bromide into the atmosphere.

87. In response to a question regarding the separation of quarantine and pre-shipment uses of methyl bromide, he highlighted the distinction between the requirements for exotic and common, or domestic, pests. Quarantine uses were generally for exotic pests that were not present, requiring a very high level of disease control, as close as possible to 100 per cent. Pre-shipment uses were for common pests, hygiene and generally for commodities leaving a country and did not require the same level of disease control, therefore a wider range of alternatives to methyl bromide could be used. The Committee estimated that, by differentiating between the two uses and using a wider range of alternatives for pre-shipment, parties could reduce methyl bromide use by approximately 3,000 metric tons annually.

88. Responding to a question on controlled uses, he said that extensive surveys carried out by the Committee had shown that the controlled use of methyl bromide continued to take place in certain countries.

89. Responding to a question to the Medical and Chemicals Technical Options Committee, Ms. Tope explained that, while not appearing in the progress report, emissions estimates for feedstocks would be found in the quadrennial assessment report submitted later in the year. Responding to another query, she said that the 3.6 per cent feedstock emission factor reported in a recent paper had originally been developed by the Panel for its 2022 assessment report and repeated in its 2024 progress report. That figure was the Panel's estimate of a mean most likely emission factor from production feedstock use and distribution emissions. The 0.5 per cent emission factor estimated in the early 1990s had been the Panel's best estimate of emissions based on facilities primarily in the United States and the European Union. She recommended that any questions on the impact of such emissions on the ozone layer be directed to the Scientific Assessment Panel.

90. Asked how many facilities currently used the new steam plasma arc destruction technology, she indicated that it was difficult to tell based on the information provided. The technology was patented but not clearly in use, and might just be an emerging technology, not yet in commercial use. As to whether it could be recommended for approval for other categories of controlled substances, she said that the submission indicated that tests had been done on 90 different compounds but did not specify which compounds. The Panel could do a further evaluation of the technology if more information became available.

91. Addressing questions regarding inhalers, she noted that the progress report provided an overview of barriers for Article 5 parties and barriers arising from the regulatory impact on propellant availability and the potential impact of the HFC phase-down schedule on continuity of supply of HFC-134a and HFC-227ea, the current propellants in metered-dose inhalers. The 2026 quadrennial assessment report would have a more detailed assessment of the challenges and barriers as well as certain issues for Article 5 parties, including technology transfer. In terms of the pace of change, the transition was still in its early stages and it was difficult to say how the challenges might play out over time. For the moment, the Panel was indicating risk areas, which related to whether the pace of transition would match the phase-down schedule under the Kigali Amendment and whether an adequate supply of alternatives would be available. She recommended that parties use that information to make their stakeholders aware of the risks in order to smooth the way for transition and prevent the risks from materializing. In terms of the uptake of dry powder inhalers, the different rates among regions related to some degree to affordability; dry powder inhalers were not very accessible or affordable in many parts of the world, creating a barrier to adoption in Article 5 parties. In addition, dry powder inhalers were suitable for many patients but not all, such as very young or very old patients with poor inspiratory flow.

92. Mr. Zhang, responding to a question about feedstock use of HCFC-22, confirmed that the substance accounted for about 50 per cent of feedstock used. Its use had grown owing to increased demand for tetrafluoroethylene (TFE) but especially for hexafluoropropylene (HFP), which was a feedstock for HFO-1234yf as well as for the perfluoroketone, a fire-fighting agent. HFP was also increasingly used as a heat transfer fluid in the data centres.

93. Responding to a question to the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee regarding capacities associated with the transition of air-conditioning and heat pump systems to HFC-32 and R-454B, Mr. Abdelaziz said that, according to the information available, there were capacities in the 5–15 metric ton range for conventional designs but not necessarily for high ambient temperature environments. The Panel had no evidence regarding whether system capacity degraded at high ambient temperatures of 46–48 degrees Celsius but was aware that the performance of HFC-32 and R-454B was better than that of R-410A at elevated temperatures. On the related question of the impact of refrigerant charge limits, room size limits and leak detectors and the impact on using ducted split and other air-conditioning systems in the range of 5–15 metric tons, he said that there would be limitations on using A3 refrigerants but the evidence showed no problems using A2N refrigerants, especially at the lower end of the range.

94. Addressing concerns raised in relation to the discussion in chapter 6 of the report, on low-volume-consuming and very-low-volume-consuming countries, Mr. Abdelaziz assured parties that such countries were an important part of the Montreal Protocol family, and that the upcoming Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee assessment report on servicing would contain a dedicated chapter on their requirements. With regard to the implementation of decision XXXVII/3, on a study on quantities of and options for

used and unwanted controlled substances under the Montreal Protocol, including those at their end of life, and how the Panel would assess whether destruction and reclamation facilities were accessible to low-volume-consuming and very-low-volume-consuming countries, Mr. Abdelaziz referred to chapter 8 of the replenishment task force report, which contained a cost estimate of \$50,000 for a transboundary shipment of unwanted substances.

95. In response to a request, Mr. Abdelaziz provided additional information on the seven new refrigerant blends listed in table 6.1 of the progress report, saying that they had just recently been approved under American Society of Heating, Refrigerating and Air-Conditioning Engineers standard 34 or International Standards Organization standard 817 and that companies were just starting to find ways to use them in products. The Panel was not yet aware of their use by any companies or in any products. One of the refrigerant blends, R-496A, which contained perfluorocarbons R-14 and R-116, was designed to have a very low bubble point temperature and could be used for ultra-low temperature refrigeration applications. Responding to another query, he said that some 149 countries had minimum energy performance standards or labelling for air conditioning and about 135 countries had one or the other for domestic refrigeration.

96. Mr. Peixoto responded to a question about the impact of vehicle electrification on mobile air conditioning, noting that the issue had evolved from mobile air conditioning to thermal load management. New refrigerants, new systems and new technologies were being evaluated, opening up an opportunity to reposition CO₂, which was a very good refrigerant for heat pumps, an important consideration for electric vehicles that lacked engine gas for heating. For hybrid systems, propane using another indirect refrigerant was also being tested as a promising alternative. The quadrennial assessment report would contain a very detailed section addressing vehicle electrification.

97. Turning to questions related to life-cycle refrigerant management, Mr. Peixoto referred representatives to the Medical and Chemicals Technical Options Committee and its sections in the progress and assessment reports on recovery, recycling, reclamation and destruction for more information on destruction technologies and alternatives. Beyond that, servicing training was very important for the refrigerant transition, emissions reduction and energy efficiency, and the Panel had decided to include a chapter with an in-depth discussion on the challenges, barriers and alternatives associated with servicing. Recovery, recycling and reclamation had been a major challenge since the time of chlorofluorocarbons, and there were many barriers, not only in developing countries and all small island developing States, but also in countries with more organized sectors. Financial, technical and logistical aspects had to be considered, and while climate change had recently become another driving force for life-cycle refrigerant management, it remained a significant challenge for all countries.

98. Also responding to a number of questions, Mr. Rajendran began by acknowledging that, given that no single refrigerant met all the requirements for such aspects as safety, costs, climate, efficiency and environmental effects, equipment and refrigerant manufacturers were constantly faced with the question of how to prioritize trade-offs when selecting refrigerants. Clearly, a refrigerant had to deliver the desired cooling capacity, but after that, the other variables to be considered depended on the application. The Panel did not make any recommendations as to how that consideration should be tackled. Moving to a question on the growing use of carbon dioxide in large systems and propane in small systems and monoblock heat pumps and the key factors enabling that growth, he noted that carbon dioxide was certainly cost-effective in delivering the desired performance in large systems. In addition, the size factor was slowly decreasing and could be expected to eventually be much better than it was currently. Propane delivered very good performance but its use was limited by the amount of refrigerant charge allowed under the various safety standards. Small systems using propane were almost always factory charged and leak tested and shipped out pre-charged, a key factor in their acceptability.

99. Asked what effect the growth of data centres might be having on refrigerant demand, Mr. Rajendran acknowledged that while demand would clearly increase, a lot of research was being done on new ways of cooling data centres. Low-GWP refrigerants such as R-1234ze and R-1233ze tended to be used in data centres in traditional cooling technologies. The quadrennial assessment report would contain an entire chapter on data centres. As a final note, he observed that the impact of the refrigerants themselves was apt to be miniscule compared to the energy impact of data centres.

100. Responding to questions on PFAS, Mr. Woodcock stressed that the advice given by the Panel was always policy-neutral and the Panel had no intention of interfering with any party's political or regulatory processes. Nevertheless, it was a fact that regulatory decisions and delays in regulatory decision-making, could have an impact on the range of alternative substances and technologies available. He also clarified that the Scientific Assessment Panel and the Environmental Effects Assessment Panel, with whom the Technology and Economic Assessment Panel remained in close contact, would report on the processes involved in the breakdown of refrigerant gases into trifluoroacetic acid, and its environmental impacts.

101. Ms. Walter-Terrinoni added that the Panel was aware of only two broad definitions of PFAS that had been adopted, in two states of the United States, that could affect substances controlled under the Montreal Protocol and their replacements. Mr. Rajendran clarified further that regulations on PFAS would affect the availability not only of refrigerants but also of the fluoropolymers used in gaskets, seals and bearings in refrigeration, air-conditioning and heat pump equipment.

102. Mr. Chattaway said that in terms of delays caused by regulation, the main issue was not with HFCs but with halon 1301. There was currently only one serious alternative to its use in fire suppression, namely a 2BTP/CO₂ blend, but the aviation industry remained unwilling to commit the substantial resources necessary to develop that alternative fully while there remained uncertainty over whether forthcoming regulations would prevent its use.

103. Responding to questions on the organization of the Panel, Ms. Pizano confirmed that the Panel had considered options for restructuring its technical options committees rather than retaining the existing structure, and their recommendations reflected their discussions; Ms. Maranion added that the matter remained under review. The Panel had also considered the possibility of all the committees meeting together for in-person meetings, but that was complicated by the fact that the committees sometimes combined their meetings with field visits. Responding to a question on travel costs for Panel members from non-Article 5 parties, Ms. Pizano clarified that no overall estimate had been made; sometimes such members were able to access funding from other sources.

104. On the use of experts and subsidiary bodies, Ms. Maranion commented that the Panel was considering the possibility of a standing task force on replenishment, given the difficulties faced in putting together a new task force every three years. She also confirmed that the annual in-person meeting of the Panel involved only the co-chairs of the technical options committees and the senior experts, and not the full membership of all the committees. She agreed that the Panel faced challenges in reaching an appropriate balance of membership in terms of age as well as geographical origin and gender, just as the parties did; the Panel relied on nominations from the parties to help resolve them. Mr. Woodcock added that the Panel would keep under review options such as using individual experts or convening less frequent meetings when there was less technical progress on which to report; the Panel was keen to remain fit for purpose to meet the needs of the parties.

105. Responding to questions on the organization of the Medical and Chemicals Technical Options Committee, Ms. Tope confirmed that the Committee's two sub-groups regularly discussed cross-cutting issues, including when discussing the Committee's workplan and when reaching consensus on its reports. Those discussions were very important and would not be helped by separating out the two subcommittees. They were roughly the same size, although the chemicals subcommittee was slightly larger than the medical subcommittee. Given that the total size of the Committee was about 40 people, she expressed the hope that parties would consider applying the same model as in the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee, and appoint four co-chairs.

106. Mr. Rajendran added that the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee also had two subcommittees, each of which had about 20 members. The bulk of their work lay in cross-cutting issues, such as life-cycle refrigerant management or energy efficiency, where there was a substantial overlap in expertise. He expressed the view that the new structure was working extremely well, as the parties would see when the assessment report was produced at the end of the year. He also clarified that the "other" category in the title of the cold chain and other subcommittee referred to not-in-kind technologies and data centre cooling.

A. Halon 1301 and its continuing use in the aviation industry; management of other controlled substances used for fire suppression (decision XXXVII/4)

107. Introducing the sub-item, the Co-Chair recalled that, in addition to requesting the Technology and Economic Assessment Panel to submit a report on halon availability and the global distribution of halon banks, in decision XXXVII/4, the Thirty-Seventh Meeting of the Parties had requested parties to submit to the Secretariat, on a voluntary basis, available information regarding the development of suitable alternatives for fire suppression. She thanked the 35 parties that had made submissions; they would be considered by the Panel, together with any further submissions from parties, for its 2027 progress report.

108. She also noted that the Secretariat, in collaboration with the secretariat of the Basel, Rotterdam and Stockholm conventions and the Multilateral Fund secretariat, had prepared a practical guide on transboundary movements of controlled substances and the equipment containing them. A draft version of the guide had been posted on the meeting portal for review and use by the parties.

109. All the representatives who took the floor thanked the Technology and Economic Assessment Panel and its Fire Suppression Technical Options Committee for their hard work. Several representatives, including one speaking on behalf of a group of parties, also welcomed the collaboration between the Secretariat and the secretariat of ICAO to assess global halon availability. Some representatives commented on their parties' ongoing efforts to assess the remaining uses of halons in their countries, the availability of suitable alternatives and future supply arrangements consistent with the objectives of decision XXXVII/4.

110. Several representatives expressed concern over the approaching run-out date for halon 1301 of 2035, plus or minus four years, and the risks that it posed to the phase-out of halons and the phase-down of HFCs if no alternatives could be developed. One representative drew attention to ICAO Resolution A42-11, in which the Council had been directed to develop a proposal for a revised sustainable effective cut-off date for halon replacement in cargo compartments and fire suppression systems in new aircraft designs; in practice that could mean that the global civil aviation industry was committing to at least an additional 50 years' use of halons. They recognized that work on alternatives was ongoing and expressed the hope that it would continue so that stocks of existing halons could be preserved for those uses for which there were no alternatives.

111. One representative, speaking on behalf of a group of parties, reported that an alternative to halon 1301 – a 2BTP/CO₂ blend – was already available for several critical applications, including for use in handheld extinguishers, engine nacelles and cargo compartments; that alternative had already been approved for use in her country. Her party had also prohibited the installation of new halon systems in aircraft cargo compartments from the end of 2024, and would require all existing systems to be retrofitted by the end of 2040, which also applied to some other applications, such as use in military vehicles. Furthermore, her party had already committed to include exemptions in forthcoming PFAS regulations for critical sectors in which no suitable non-PFAS alternatives were available; the aviation sector would be considered in that context. Since the introduction of alternatives would increase the availability of halon 1301 for uses where no alternatives existed, and in older aircraft, the end dates for availability that had been discussed in the report of the Technology and Economic Assessment Panel would be affected. She welcomed the Panel's commitment to reexamine their scenarios.

112. One representative reported that the use of 2BTP had already been approved in her party, and the use of the 2BTP/CO₂ blend was in the process of assessment. She called for clear information on regulatory frameworks in different parties so that manufacturers could plan accordingly.

113. A representative of an Article 5 party stressed the importance of ensuring that the management of existing banks did not compromise the fire suppression capabilities of current fleets. She called for the burden of expediting the development, certification and deployment of alternatives to lie primarily with the original equipment manufacturers and the global aerospace industry. She also stressed the need for the alternatives to halon 1301 to be not only technically viable but also commercially available and economically affordable for airlines in developing countries, and for the transition to be accompanied by capacity-building and technology transfer.

114. Several representatives commented on the need to maximize the recovery and reuse of halons, and to avoid the destruction of halons which could be recycled and reused. One said that it would be useful to have globally recognized guidelines distinguishing between contaminated halon and usable reclaimed halon, which would help to ensure that airlines could access necessary stocks without turning Article 5 parties into dumping grounds for waste. Another observed that the destruction of halons was forbidden in her party, thereby incentivizing recovery and reuse.

115. A number of representatives made observations on the potential application of the Protocol's essential-use exemption procedure to halon 1301. They expressed the view that since shortages were not expected imminently, there was no urgency in starting work on a potential revision. One representative highlighted the fact that since individual parties would not know in advance the quantities of halon 1301 required to be produced and consumed on an annual basis to meet the servicing needs of civil aviation within their jurisdictions, the current essential-use exemption process would probably not be adequate to address their needs for halon 1301. It would therefore be worthwhile to begin considering the issue in case an essential-use nomination did become necessary in the future.

116. Several representatives said that they would appreciate the opportunity for more in-depth technical discussions with the Technology and Economic Assessment Panel, together with further clarifications on the assumptions and figures presented in the Panel's report.

117. The Working Group concluded its discussion of the sub-item. In closing the sub-item, the Co-Chair suggested that interested parties find time for informal discussions with the Fire Suppression Technical Options Committee in the margins of the meeting, observing that the issue could be taken up again in 2027 after the publication of the quadrennial assessment report and the 2027 progress report.

B. Metered-dose inhalers with low-global-warming-potential propellants (decision XXXVI/6)

118. Introducing the sub-item, the Co-Chair recalled that, in decision XXXVI/6, the Thirty-Sixth Meeting of the Parties had requested the Technology and Economic Assessment Panel to continue to provide updated information on low-GWP metered-dose inhalers in its annual progress reports. It had updated parties on the issue during its presentation earlier in the week.

119. Thanking the Panel for its report, one representative, speaking on behalf of a group of parties, observed that it highlighted several positive developments that had taken place since the previous year's report. The use of dry powder inhalers was becoming more common in many countries, and several manufacturers, including in some Article 5 parties, had developed new generation metered-dose inhalers with lower-GWP propellants. In his party, the HFC quota system introduced in 2025 provided a policy driver for the replacement of high-GWP HFCs. He encouraged other parties to submit information on developments in their countries to the Secretariat, and looked forward to further discussions on the issue after the next quadrennial assessment report.

120. Another representative, while agreeing that progress was encouraging, cautioned that low-GWP alternatives were still at an early stage of development and were not yet readily available in many parties. He also agreed with the request to parties to share information on technological developments, regulatory approvals, manufacturing considerations and transition planning in their own countries and asked the Secretariat whether it would be possible to make the submissions that had been made by two parties available on the Secretariat's website. The representative of the Secretariat responded that it would be, if those parties gave their permission to do so.

121. A representative of an Article 5 party commented that health considerations were just as important as environmental issues in the transition. Given that metered-dose inhalers accounted for approximately 70 per cent of global inhaler doses, it was important not to disrupt access to life-saving medications or disproportionately to burden patients in low- and middle-income countries with increased costs. Parties must retain the sovereign right to determine their own transition pathways based on their healthcare frameworks, the maturity of alternatives and the time required for national approval processes. Observing that intellectual property and

technology transfer constraints posed significant barriers to the cost-effective availability of alternative propellants, she called for measures to avoid patents restricting generic manufacturing in Article 5 parties, and for technical and financial support for those parties.

122. A number of representatives agreed, calling for encouragement for continued efforts by industry, parties and other relevant stakeholders to ensure that low-GWP metered-dose inhalers were made available at affordable prices, supported by adequate technology transfer and capacity-building for Article 5 parties. One observed that the manufacture of metered-dose inhalers in his party accounted for 30 per cent of his country's total consumption of HFC-134a. Another representative, noting that a manufacturer of inhalers in her country had claimed that no alternatives to HFC-134a were available, called for more information on the availability and cost of alternative propellants.

123. One representative recalled that, since not all patients could tolerate alternative substances as propellants in metered-dose inhalers, it would be vital to ensure that the use of HFC-134a could be continued after 2030. It would therefore be important to retain the Kigali Amendment's requirement for a phase-down rather than a phase-out of HFCs.

124. The Working Group concluded its discussion of the sub-item. In closing the sub-item, the Co-Chair observed that the issue could be taken up again in 2027 after the publication of the quadrennial assessment report.

C. Options for the organization of the Panel and its technical options committees (decision XXXV/20)

125. Introducing the sub-item, the Co-Chair drew attention to paragraphs 20–22 of the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group at its forty-eighth meeting (UNEP/OzL.Pro.WG.1/48/2), paragraphs 49–56 of the addendum thereto (UNEP/OzL.Pro.WG.1/48/2/Add.1), and chapter 8 of and annex III to the report of the Technology and Economic Assessment Panel, May 2026, volume 1. She recalled that, at the forty-seventh meeting of the Open-ended Working Group, an informal group of interested parties had met in the margins of the meeting with the co-chairs of the Panel and its technical options committees to discuss the options for the organization of the Panel and its technical options committees that been presented by the Panel in chapter 8 of its 2025 progress report. At the Thirty-Seventh Meeting of the Parties, the informal group had concluded that the time was not right to restructure the Panel and its technical options committees, and the parties had agreed to include the item on the agenda of the current meeting. In chapter 8 of its 2026 progress report, the Panel presented further analysis and highlighted preferred options for reorganization. A summary of that analysis was set out in the addendum to the note by the Secretariat. There had also been an initial exchange on the matter in the question-and-answer session that had followed the presentations given by the Panel on its 2026 progress report at the current meeting.

126. In the ensuing discussion, several representatives, including one speaking on behalf of a group of parties, expressed their appreciation for the work of the Panel, its technical options committees and its subsidiary bodies, and all the information that it provided to the parties. They thanked the Panel for its consideration of the Panel's organization as well as that of the technical options committees and for recognizing the importance of sustainability and the difficulties associated with change management. Several representatives, including one speaking on behalf of a group of parties, pointed out that discussions on possible reorganization had been going on for several years. Some of them, including the representative speaking on behalf of the group of parties, said that they appreciated the fact that the Panel had highlighted its preferred options for reorganization, which had not been the case in previous reports.

127. One representative said that he was broadly supportive of the Panel's preferred option for the configuration of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee, namely two subcommittees. There were differing views, however, on the configuration of the Medical and Chemicals Technical Options Committee. While one representative expressed support for the concept of two subcommittees, another representative said that there was a strong case for exploring the separation of the technical options committee into two discrete committees, as its current remit on medical and aerosol issues and chemical issues fell into two increasingly different work streams. The separation of those functions would

help ensure appropriate focus and delivery; overlaps between the technical options committees could be managed by the Panel.

128. One representative noted the similarities between the current sub-item and agenda item 6 on ensuring the viability of Montreal Protocol by making its processes more efficient and effective. The current discussion should also focus on the long-term viability of the Panel, including how to sustain a diverse and balanced expert base, ensure appropriate support for participation and build a future pipeline of experts. Another representative noted that, although online meetings led to savings, they did not promote the mutual respect and trust that came from personal interaction. The same representative noted the difficulties caused by senior experts also being members of technical options committees and supported the proposals to reduce the number of senior experts and for the remaining senior experts not to be members of technical options committees. Another representative underscored the need to ensure equitable geographical representation within the Panel and all of its technical options committees and the importance of increasing the participation of experts from developing countries, including in Africa.

129. Several representatives suggested that the matter be discussed further in an informal group, in which the Panel should also participate to answer further questions.

130. The Open-ended Working Group agreed to establish an informal group, to be co-facilitated by Heidi Stockhaus (Germany) and Camilla Noel (Vanuatu), to discuss further options for the organization of the Panel and its technical options committees.

131. Subsequently, the co-chair of the informal group reported that, owing to time constraints, it had not been possible for the group to conclude its work. The Working Group therefore agreed to resume discussions on the options for the organization of the Panel and its technical options committees at the Thirty-Eighth Meeting of the Parties, noting that the Panel would respond, before that meeting, to a number of the questions raised by parties in the informal group.

D. Changes in the membership of the Panel

132. Introducing the sub-item, the Co-Chair drew attention to paragraphs 23 and 24 of the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group at its forty-eighth meeting (UNEP/OzL.Pro.WG.1/48/2), paragraphs 57–62 and table 3 of and annex III to the addendum thereto (UNEP/OzL.Pro.WG.1/48/2/Add.1) and annexes II and III to the report of the Technology and Economic Assessment Panel, May 2026, volume 1. She recalled that table 3 of the addendum to the note by the Secretariat listed nine Panel members whose term expired at the end of 2026 and whose reappointment required a decision by the Thirty-Eighth Meeting of Parties. The terms of some members of the technical options committees also expired at the end of 2026, but their reappointment did not require a decision by the Meeting of the Parties. As the nominations to technical options committees could be made at any time, the issue need not be taken up by the Open-ended Working Group or the Meeting of the Parties. Regarding the nine Panel positions that required a decision, the Secretariat was collecting nominations and would post them on the meeting portal of the Thirty-Eighth Meeting of the Parties as they became available.

133. One representative stressed that any future changes in the Panel or its technical options committees should preserve the bodies' technical expertise, equitable geographical representation and the representation of Article 5 parties, particularly from the high-ambient-temperature countries. Any future proposals should be developed through large-scale consultations with parties and should be based on a clear impact assessment.

134. The Working Group concluded its discussion of the sub-item. In closing the sub-item, the Co-Chair encouraged interested parties to consult one another and with the Panel in the margins of the current meeting with a view to continuing discussions on the matter at the Thirty-Eighth Meeting of the Parties.

E. Any other issues

Evaluation of a destruction technology

135. Introducing the sub-item, the Co-Chair drew attention to paragraph 25 of the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group at its forty-eighth meeting (UNEP/OzL.Pro.WG.1/48/2) and paragraphs 63–71 of the addendum thereto (UNEP/OzL.Pro.WG.1/48/2/Add.1).

136. The representative of Canada introduced a draft decision set out in a conference room paper. He thanked the Technology and Economic Assessment Panel and the Medical and Chemicals Technical Options Committee for their thorough evaluation of the steam plasma arc destruction technology and for the recommendation that parties approve it as a new generic category of destruction technology. As described in the Panel's report, the technology was distinct from other plasma-based technologies, because superheated steam served as the main plasma-forming gas, as opposed to argon or nitrogen, which were already processes included in the list of approved destruction technologies. He noted that the information in the evaluation by the technical options committee of submitted performance data relating to the destruction technology indicated that the destruction and removal efficiency achieved for CFC-11, CFC-12, HFC-22 and HFC-134a was greater than 99.9 per cent by at least one order of magnitude. The evaluation had also shown that the technology resulted in emissions levels of dioxins and furans, acid gases, particulate matter and carbon monoxide that were far below the recommended advisory thresholds established by the Panel. As far as he knew, there had been only minor use of the destruction technology as it had yet to be deployed in full commercially. Tests had been carried out on the aforementioned substances only, but it was possible that there would be tests on other substances in the future. The representative of Canada noted that the destruction technology was physically very small, taking up some 15–25 square metres, and that its operation was all-electric and did not require the direct use of fossil fuels. The addition of the steam plasma arc destruction technology to the list of approved destruction technologies would provide parties with another option for the disposal of end-of-life controlled substances in accordance with the Montreal Protocol. The draft decision was simple and administrative in nature, following the standard approach for adding technologies to the list. Approval would be for use of technology for the destruction of substances in Annex A Group 1, Annex C Group 1 and Annex F Group 1. The decision would also invite parties to continue to submit to the Ozone Secretariat information relevant to the review of destruction technologies.

137. Representatives thanked Canada for the draft decision and the Technology and Economic Assessment Panel for the information relating to the review process and for its conclusion to recommend that the technology be added to the list of approved destruction technologies. There was universal support for the draft decision among the representatives who spoke.

138. One representative, while expressing appreciation for the inclusion of an additional option for parties for the destruction of ozone-depleting substances, noted that it was extremely expensive as far as capital investment was concerned, and energy-intensive, and required specialized technical expertise for its operation. The use of the new technology would not therefore be possible in a number of Article 5 parties without sufficient financial support from the Multilateral Fund to cover the capital expenditure costs, long-term technical support and an integrated capacity-building programme.

139. One representative proposed that a form, to be filled out when parties provided the information requested in the draft decision, be included as an annex to the draft decision to ensure that the information provided was harmonized. The representative of Canada explained that the Technology and Economic Assessment Panel would advise parties on the specific information to be submitted to the Ozone Secretariat and ways of doing so.

140. The Working Group agreed to forward the draft decision on destruction technologies for controlled substances, as set out in section A of annex I to the present report, to the Thirty-Eighth Meeting of the Parties for possible adoption.

V. Enhancing regional atmospheric monitoring of substances controlled by the Montreal Protocol (decision XXXVII/1)

141. Introducing the item, the Co-Chair recalled that, in decision XXXVII/1, the Thirty-Seventh Meeting of the Parties had requested the Ozone Secretariat to report to the Open-ended Working Group at its forty-eighth meeting on progress in and any outcomes of the evaluation of the suitability of potential sites situated in the regions and locations identified by the Advisory Committee of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention for the Protection of the Ozone Layer and on possible next steps towards establishing monitoring activities at the potential sites. Information on progress in implementing the decision was set out in paragraphs 26–30 of the note by the Secretariat on issues for discussion by and information for the attention of the Open-ended Working Group at its forty-eighth meeting (UNEP/OzL.Pro.WG.1/48/2) and paragraphs 83–88 of the addendum thereto (UNEP/OzL.Pro.WG.1/48/2/Add.1). The Working Group also had before it an information document containing decision 98/62 of the Executive Committee, on matters relating to pilot projects to enhance regional atmospheric monitoring of substances controlled by the Montreal Protocol (UNEP/OzL.Pro.WG.1/48/INF/5).

142. The representative of the Secretariat and member of the Advisory Committee of the Vienna Convention General Trust Fund, Sophia Mylona, and A. R. Ravishankara, Co-Chair of the Advisory Committee, gave a presentation on the progress made in implementing decision XXXVII/1, including the development of an online costing tool, the 10 regions and locations identified by the Advisory Committee to fill gaps in regional atmospheric monitoring of controlled substances, the continuation of the evaluation of the suitability of five prioritized regions and locations, the establishment of a funding window under the Multilateral Fund, and emerging considerations.

143. In the ensuing discussion, many representatives thanked the Advisory Committee and the Ozone Secretariat for the presentation and for their continued work on moving the initiative forward. Several representatives, including one speaking on behalf of a group of parties, noted with particular appreciation the Secretariat's development of a costing tool, which parties were encouraged to test.

144. Several representatives, including one speaking on behalf of a group of parties, recalled the origins of the initiative in 2018, when parties had fully realized how crucial atmospheric monitoring was to safeguarding the Protocol's legacy and enabling its effective implementation, and acknowledged with appreciation the substantial progress made since that time. One, summarizing the progress made in the previous two years alone, recalled that the Advisory Committee had conducted Observing System Simulation Experiments (OSSEs) and approached Governments, that several Governments had indicated their interest in hosting a station, and that the European Union had pledged to contribute €4.5 million to support the establishment of three new monitoring stations. Furthermore, the Executive Committee of the Multilateral Fund, at its most recent meeting, had decided to create a \$9.25 million funding window for three pilot projects to enhance regional atmospheric monitoring, and to add to the funding window the amount of \$1.8 million for the continuation of operation of three atmospheric monitoring stations to be established, presumably thanks to the contribution from the European Union. Some representatives, including one speaking on behalf of a group of parties, drew attention to other positive aspects of the Executive Committee's decision, with one noting the adoption of guidelines for the preparation and implementation of pilot projects to enhance regional atmospheric monitoring and another, speaking on behalf of a group of parties, welcoming the identification of the World Meteorological Organization (WMO) as a Multilateral Fund implementing agency under the new funding window.

145. One representative, speaking on behalf of a group of parties, took the opportunity to provide an update on his party's intended contribution, which, he recalled, equated to about \$5.2 million. Notwithstanding some administrative delays, his party hoped to give the green light on the availability of those funds in the current year.

146. Several representatives voiced some concern with respect to the proposed new stations. Several stressed the need to ensure that sites were established solely on a voluntary basis and that dedicated funding was provided to ensure station sustainability. Some called for clear data governance, including one who specified that all raw and validated data generated by monitoring

stations hosted in Article 5 parties should be shared first with the national ozone unit. The same representative cautioned that the regional atmospheric monitoring network should function strictly as a supportive instrument for local scientific capacity-building and domestic policy formulation and not as an external compliance policing or enforcement mechanism. Another representative recommended that authorization for stations be obtained from all the countries within the sampling coverage area, in addition to the host country.

147. During the discussion, the representatives of Bangladesh, Brazil and Mexico each indicated their country's interest in hosting a monitoring station. Another representative suggested that existing monitoring sites such as the one in the East Africa region be considered for upgrading under the initiative.

148. In terms of next steps, a representative speaking on behalf of a group of parties said that parties' interest and potential locations should be further explored, and he encouraged developing countries that had not yet done so to indicate any interest they might have in establishing monitoring sites. He also highlighted the need to formalize structures as the initiative moved into the operating stage, including defining a role for the Advisory Committee and providing for consistency in the processes of the General Trust Fund, the Multilateral Fund and the implementing agencies. He announced his intention to submit a draft decision on the matter for consideration by the Thirty-Eighth Meeting of the Parties and said that he was open to holding informal discussions at the current meeting and intersessionally with all interested parties, as well as the Multilateral Fund secretariat, the Ozone Secretariat, the Advisory Committee and WMO, with the goal of elucidating a clear path forward.

149. Other representatives also acknowledged the need to clarify the differences between the two funding streams and the responsibilities of the Advisory Committee and the Executive Committee, as well as to coordinate the work of the Meeting of the Parties and the Executive Committee.

150. Responding to representatives' questions and comments, Mr. Ravishankara said that the Advisory Committee stood ready to help in any way it could with the preparation of a draft decision on the matter. Turning to the questions surrounding potential sites, he noted with appreciation that the Advisory Committee had already benefited from testing of the Bhola Island site in Bangladesh thanks to pilot project funding from the European Union. There had been some issues with local emissions, but the Bhola Island experience had provided about 18 months' worth of data and had been extremely helpful, and there remained other potentially suitable sites in Bangladesh to be investigated. He stressed that site selection and testing were solely aimed at quantifying emissions as accurately as possible in order to keep the Montreal Protocol on track and remained completely voluntary for countries. Asked what costs would be covered by the funding, he suggested that parties try using the costing tool to help address that question. He also noted that the European Union funds were slated for at least three stations, meaning that they could cover more, depending on the costs involved. The question of funding for sustainability was also important, although it was clear that once a site was determined to be suitable parties would want to sustain it for as long as possible, which was where the Multilateral Fund resources came into play. Addressing the suggestion that approval would need to be obtained from all countries to be affected by sampling at a given site, he suggested that countries in the same regions come together to consider the question. As a rough guide to the extent of the affected area, he indicated a radius of 500–1,000 kilometres, depending on the prevailing winds. Finally, he acknowledged with appreciation that many stations were being set up in China, which would cover the region of central-western Asia. In addition, the Government of China was setting up a calibration facility and had indicated its interest in doing so elsewhere; the Advisory Committee was very appreciative of those efforts and was coordinating with the scientists in China on that initiative.

151. Ms. Mylona added a clarification regarding the prioritized sites, noting that they had been identified based on the OSSE results, which indicated how capable the sites were of detecting regional emissions, as well as on emission patterns, available infrastructure and expertise. They were thus based solely on scientific considerations, although it was clear that nothing could be done without the permission of the national Government involved. She also addressed a question regarding cooperation with WMO, noting that the Advisory Committee had for many years enjoyed excellent cooperation with WMO in connection with the implementation of ozone and ultraviolet monitoring projects, for which WMO was responsible. In terms of atmospheric monitoring, she noted that additional discussions between the Ozone Secretariat, the

Advisory Committee and WMO and its relevant groups, such as its scientific advisory group on greenhouse gases, would be needed to streamline and better define that cooperation.

152. Based on the discussion, the Working Group agreed that the parties would continue informal discussions in the margins of the current meeting and during the intersessional period, including consultations on a draft decision, and would pursue their discussions at the Thirty-Eighth Meeting of the Parties.

VI. Ensuring the viability of Montreal Protocol operations (decision XXXVII/7)

153. Introducing the item, the Co-Chair recalled that, in decision XXXVII/7, the Thirty-Seventh Meeting of the Parties had requested the Ozone Secretariat to prepare a report, for consideration by the Open-ended Working Group at its forty-eighth meeting, on the options for making effective and efficient changes, with associated cost estimates, to the timing of, Ozone Secretariat support for and length of the Meetings of the Parties and meetings of the Open-ended Working Group, the Implementation Committee and the assessment panels, and the timing of replenishment decisions. The report was set out in documents UNEP/OzL.Pro.WG.1/48/4 and UNEP/OzL.Pro.WG.1/48/4/Add.1.

154. In the ensuing discussion, one representative said that he would have expected a brief presentation of the documents by the Secretariat to orient the discussion, but noted that it was not essential. He pointed out that the addendum to the document had only been issued on 9 July 2026, and said that his delegation therefore required more time to consider it in detail.

155. Many representatives took the floor to thank the Secretariat for the report, stressing their agreement that the Montreal Protocol system should work as efficiently as possible. Several recalled that the Montreal Protocol was often cited as the most effective environmental treaty in history, and some said that its success was a direct result of its time-tested, inclusive and highly interactive institutional mechanisms. On that basis, some representatives asked why changes to the current processes were being considered, and why the Montreal Protocol would look at the processes of other multilateral environmental agreements to learn about best practice, as had been suggested by a representative speaking on behalf of a group of parties.

156. All the representatives who spoke said that any agreed changes should preserve the effectiveness, transparency and inclusive participation of all parties and should not compromise the success of the Protocol. Some representatives said that, as the Protocol had been operating the same way for several decades, it was time to review the processes with the aim of enhancing efficiency while maintaining or strengthening the Protocol's impact, to adapt to changing circumstances and to ensure that the system remained fit for purpose. Several representatives said that the question of how to ensure the viability of the Protocol's operations was timely, given the reduction of the cash reserves over recent years, the general funding uncertainties and the ongoing United Nations reforms, including the UN80 initiative.

157. On the issue of the formal format of meetings, many representatives said that, while online and hybrid formats offered financial savings, they created barriers to the participation of Article 5 parties, as had become apparent during the coronavirus disease pandemic. Unreliable connectivity and time-zone differences made meeting participation difficult. Furthermore, sensitive negotiations were difficult to conduct online; informal consultations in the margins of meetings were key to building consensus. As for the meetings of the Open-ended Working Group, that was where all the technical issues were explored in depth, delegations exchanged experiences and regional groups coordinated their positions to build common ground before decisions were taken by consensus by the Meeting of the Parties. A number of representatives expressed their agreement regarding the importance of in-person contact for certain issues but said that hybrid formats were well adapted to information-sharing objectives.

158. Several representatives stressed the need to address the issue of insufficient contributions, with one noting that, even with drastic operational cuts, the Trust Fund balances would continue to be at risk if the contributions received remained at 70 per cent of what was needed. He said that structural alterations to Montreal Protocol operations should not be viewed as a substitute for addressing the problem of insufficient contributions. Several representatives, including one speaking on behalf of a group of parties, underscored the importance of all parties meeting their financial obligations, with one asking parties to consider increasing their

contributions. Another representative supported the Secretariat proposal that contributions by parties should match the budget in any given year. One representative pointed out that the assumption used by the Secretariat that about 75 per cent of contributions would be received offered no guarantee. Future income was extremely difficult to predict. Another representative said that the reduction of the cash reserve had occurred for several reasons: parties had decided to keep contributions at the same rate and draw down on the cash reserve to cover the difference between the budget and contributions; some parties had not made the required contributions to the Montreal Protocol and the Vienna Convention Trust Funds; and there was a willingness to use the cash reserve for extra activities in addition to activities funded through the regular budgets.

159. Regarding the frequency of meetings, several representatives said that they did not agree with the proposal to move to a biennial cycle for the Meetings of the Parties. Several representatives, including one speaking on behalf of a group of parties, said that there was significant ongoing work or issues still to address, including the implementation of the Kigali Amendment, replenishment-related negotiations, consideration of the reports and recommendations of the assessment panels, illegal trade issues, atmospheric monitoring, ongoing emissions and new emerging issues. Furthermore, an extension of the interval between Meetings of the Parties could lead to a backlog of work on critical issues and risked creating delays in efforts to address urgent, time-sensitive compliance matters through the Implementation Committee. Another representative noted that one or two years was not enough time to consider the impact of some of the decisions taken. Some representatives expressed the view that less frequent Meetings of the Parties could lead to more extraordinary Meetings of the Parties being held for the purpose of taking urgent decisions, which would increase the uncertainty of the financial situation. One representative pointed out that meeting less frequently would have a positive impact from an environmental perspective by reducing travel.

160. Concerning the proposed changes to the Multilateral Fund and assessment panel cycles, some representatives highlighted the need to prioritize ensuring that the funding needs of Article 5 parties were assessed accurately and met without disruption and that access to up-to-date technical and scientific information for decision-making was not limited. The panels' reports provided early warning about the needs of Article 5 parties.

161. Many parties highlighted the importance of finding out more about the various options put forward, perhaps through discussions in a contact group and through further discussions with the Secretariat, and of making full use of the current meeting as an opportunity to explore ideas, ask questions and ensure that the full range of benefits, the related costs and the unintended consequences were properly understood. They expressed the view that the Secretariat's report and the proposals made during the plenary discussion were a good basis for further discussions in a contact group.

162. One representative, supported by another, said that, while there were many interesting ideas in the Secretariat's proposed scenarios, he saw them as individual measures for consideration rather than packages and was unable to lend his support entirely to scenario B or C as they stood in the document.

163. Several representatives mentioned elements that they would like to consider further. Those included less frequent replenishments of the Multilateral Fund, possibly every four years; less frequent Meetings of the Parties; shorter meetings of the Open-ended Working Group; a reduction in the costs, and therefore an increase in the efficiency, of meetings of the assessment panels, the technical options committees of the Technology and Economic Assessment Panel and the Implementation Committee; a reduction in the workload of the assessment panels, including the issuance of assessment panel progress reports every other year; a reduction in the number of publications, streamlined documentation and greater use of digital document management; improved use of hybrid tools, but not to replace negotiation processes; and the minimization of some travel-related costs, provided that such measures did not undermine participation. One representative said that, should any adjustment be agreed, it should be done on a trial basis, allowing parties to evaluate the impact.

164. Another representative said that it could be useful to conduct a technical and legal review of the financial rules of the Montreal Protocol to see whether they continued to provide the most appropriate framework for addressing the identified financial risks. He also proposed requesting the Secretariat to draw up technical input on possible elements for review within the financial

rules, or possible updates to the rules, in line with the operational and budgetary scenarios in its report, without prejudice to the outcome of future discussions.

165. The Open-ended Working Group agreed to establish a contact group, to be co-chaired by Alessandro Peru (Italy) and Sergio Merino (Mexico), to discuss in more depth documents UNEP/OzL.Pro.WG.1/48/4 and UNEP/OzL.Pro.WG.1/48/4/Add.1 and the proposals made during plenary discussions.

166. Subsequently, the co-facilitators of the contact group reported that the group had concluded its discussions. The Secretariat had compiled a list of all the questions formulated by the participants during the discussion and had indicated its willingness to continue to receive questions by email¹ up until 31 August 2026, to be used as a basis for supplementing the information presented in its report. The compilation of questions is set out in section II of annex II to the present report.

167. The Working Group therefore agreed to invite parties to submit their additional questions by 31 August 2026 and to resume its discussion on ensuring the viability of Montreal Protocol operations at the Thirty-Eighth Meeting of the Parties, taking into account the supplementary report to be prepared by the Ozone Secretariat.

VII. Further strengthening Montreal Protocol institutions (UNEP/OzL.Pro.37/9, para. 166)

168. Introducing the item, the Co-Chair recalled that at the Thirty-Seventh Meeting of the Parties an informal group had been established to clarify and exchange views on a draft decision introduced at that meeting and other key issues raised during the informal meeting of the parties on facilitating the implementation of the Montreal Protocol convened prior to the Thirty-Seventh Meeting of the Parties. Representatives had expressed interest in continuing the dialogue on the outcomes of the informal meeting, and the parties had agreed to include the matter on the agenda of the current meeting.

169. In addition to the summary of the outcomes of the informal meeting (UNEP/OzL.Pro.37/7), parties had before them a compilation of information provided by parties on illegal trade practices and approaches taken by national authorities to identify and address such cases (UNEP/OzL.Pro.WG.1/48/3), which updated a similar compilation made available for the Open-ended Working Group at its forty-seventh meeting and included information received from parties since 22 April 2025. Since the preparation of that note, information on an additional 27 cases had been submitted to the Secretariat.

170. The representative of Cameroon introduced a conference room paper setting out a draft decision on strengthening Montreal Protocol operations, submitted by his delegation on behalf of the Group of African States. He explained that in the light of the information gathered on illegal trade since 2002, as compiled by the Ozone Secretariat, the Group of African States had seen a need for more concrete action than what was presented in the compilation document. Thus, the draft decision included requests to the Secretariat to prepare a report on the tools available to enhance tracking of illegal trade, including online marketplaces and e-commerce platforms; to develop standard operating procedures to support a harmonized approach for the detection of illegal trade, handling of cases, management of seizures, reporting and sanctions; to prepare a checklist defining the core features of effective licensing systems; and to explore the feasibility and cost of developing open-source licensing software that could be integrated into customs and single-window systems. In addition, the Executive Committee would be requested to assess the additional training and capacity needs in Article 5 parties in relation to illegal trade, licensing systems and data reporting, in consultation with national ozone officers, the Compliance Assistance Programme and the World Customs Organization, as appropriate.

171. The representative of Canada, speaking also on behalf of Australia, the European Union, Norway and Switzerland, introduced a conference room paper setting out a draft decision on strengthening licensing systems and data reporting to prevent illegal trade. He noted that, much like the draft decision of the Group of African States, his group's submission was aimed at addressing key issues identified in recent years, mainly by strengthening parties' licensing

¹ Addressed to mea-ozoneinfo@un.org.

systems for the import and export of controlled substances and strengthening data reporting, although it also reiterated decisions that might have been forgotten or were not implemented systematically by the parties. The draft decision began with a request to the Ozone Secretariat to prepare a checklist on core features of licensing systems, intended to serve for information purposes. The group also proposed to urge parties that had not yet done so to inform the Secretariat whether their licensing systems covered used, recycled and reclaimed controlled substances in addition to new substances, which was an obligation under Article 4B of the Protocol. Parties would further be encouraged or requested to ensure that their licensing systems covered controlled substances in trans-shipment, including substances that were re-exported and substances in free trade zones; to strengthen verification practices for imports and exports and consider establishing automated systems and standardized procedures where feasible; to report the sources of imports and destination of exports of controlled substances; and to use the online reporting system for Article 7 data reporting. In addition, national ozone units and customs officers would be encouraged to share data to better track and monitor imports of controlled substances. The draft decision included a reminder that the Compliance Assistance Programme was available to support Article 5 parties in designing and implementing their national licensing systems. Finally, it contained requests to the Ozone Secretariat to inform parties about those parties that did not report data required under Article 7 by the 30 September deadline, and to liaise with the Multilateral Fund secretariat on possible options for creating a coordinated approach to data reporting.

172. In the ensuing discussion, several representatives, including one speaking on behalf of a group of parties, thanked the Secretariat for the compilation of information provided by parties on illegal trade practices and approaches taken by national authorities to identify and address such cases.

173. Many representatives expressed their gratitude to the proponents of both conference room papers for their efforts in proposing ways to strengthen licensing systems, enhance customs cooperation and combat illegal trade in controlled substances under the processes of the Montreal Protocol, and said that they would welcome the opportunity to discuss both draft decisions further.

174. One representative, speaking on behalf of a group of parties, noted that the fact that two conference room papers had been submitted on the matter, both of which built on previous discussions and on the draft decision submitted in a conference room paper at the Thirty-Seventh Meeting of the Parties, demonstrated the need and willingness of parties to further discuss the strengthening of the Montreal Protocol institutions.

175. Several representatives underscored the need for any proposed measures to respect national laws, circumstances and institutional mandates. Given the differences in national legislation for implementing the provisions of Article 4B of the Montreal Protocol, it was important to recognize that there would therefore always be differences in the national licensing systems and that a flexible approach must be taken to the way in which a party implemented its obligations under the Protocol. In that regard, one representative, who noted that her party's national licensing system had been in place for over 25 years, said that it was critical that no proposals be made that obliged parties to make substantive changes to their licensing systems where such changes were not necessary for compliance under the Montreal Protocol.

176. One representative stressed that an effective licensing system was one of the most important tools for parties in ensuring compliance with their obligations under both the Montreal Protocol and its Kigali Amendment. She welcomed the emphasis placed on strengthening licensing systems through improved verification practices, closer coordination between national ozone units and customs, and greater use of automated and digital systems. Noting that she saw value in particular in developing guidance on the core features of the effective licensing systems, she said that promoting practical, interoperable and cost-effective licensing solutions would greatly benefit many Article 5 parties. Another representative stressed that any licensing checklists should be voluntary and reflect national legal and administrative frameworks.

177. A number of representatives emphasized that any guidance, software tools or standard operating procedures that were developed should remain flexible enough to accommodate different national circumstances and capacities, as well as existing systems, and that practical support should be provided to parties seeking to strengthen their licensing and enforcement frameworks. One representative noted that work on licensing software should be undertaken

through the Executive Committee and should address cybersecurity compatibility with existing systems and national ownership and control of data.

178. Many representatives stressed that any new measures, including reporting requirements, operational procedures and implementation arrangements, should remain voluntary, facilitative and take into account in particular the national capacities of Article 5 parties. Many representatives stressed that no additional burdens should be placed on parties, especially Article 5 parties, and that any enhanced activities should be accompanied by adequate technical and financial support through the Multilateral Fund.

179. Several representatives said that any discussions on further strengthening the Montreal Protocol institutions should focus on supporting parties, especially Article 5 parties, in meeting their existing obligations under the Montreal Protocol rather than on introducing any new obligations. A number of representatives said that they did not support the proposed provision on import and export data from free trade zones, noting that those data were already included in national reporting data and did not require separate reporting. One representative stressed that the reporting of information on used, recycled and reclaimed substances, as well as on trans-shipments, re-export and sources of imports, should remain voluntary. Another representative highlighted the fact that the proposal in the draft decision presented by the representative of Canada to make the reporting of the sources of imports of controlled substances mandatory for all parties would create a substantial administrative and reporting burden for Article 5 parties. One representative said that some of the proposed actions in the draft decisions appeared to be beyond the scope of the Montreal Protocol.

180. One representative highlighted the importance of considering the burden that would be placed on the Secretariat by the need to ensure compliance with any new measures, especially given the existing significant pressure on human resources in the Secretariat.

181. One representative, noting that work was already taking place through the regional networks and through the initiative of OzonAction under UNEP to analyse and help customize licensing systems, stressed that it was important to avoid duplicating that work. Another representative drew attention to the importance of taking into consideration the work being done by UNEP and the United Nations Office on Drugs and Crime on producing a comprehensive report on illegal trade under the Montreal Protocol.

182. The Working Group agreed to establish a contact group, to be co-chaired by Liana Ghahramanyan (Armenia) and Paul Krajnik (Austria), to discuss the matter further, including by considering the two draft decisions set out in conference room papers.

183. At a later stage in the meeting, the co-chair of the contact group reported that the group had made good progress in considering both the proposals for draft decisions and had concluded that the Thirty-Eighth Meeting of the Parties should consider them further. He expressed the hope that interested parties would work intersessionally on both proposals.

184. Some representatives observed that it would be helpful if the Secretariat could provide information on actions that had been taken or were in progress relevant to the operative paragraphs in both proposals, or, where relevant, indicate that no such information existed. One of them asked in particular for information on the experience of parties and good practices in terms of cooperation with customs and other authorities.

185. The Working Group agreed to request the Secretariat to provide the above-mentioned information in advance of, and to forward both proposals for draft decisions for further consideration by, the Thirty-Eighth Meeting of the Parties. The draft decisions are set out in sections II.A and II.B of annex I to the present report.

VIII. Status of preparations for the Thirty-Eighth Meeting of the Parties, to be held in Kigali

186. Introducing the item, the Co-Chair recalled that, in its decision XXXVII/22, the Thirty-Seventh Meeting of the Parties had decided to convene the Thirty-Eighth Meeting of the Parties in Kigali from 2 to 6 November 2026, together with the seventy-seventh meeting of the Implementation Committee and a meeting of the Bureau of the Thirty-Seventh Meeting of the Parties, as well as other related events.

187. In decision XXXVII/5, the Thirty-Seventh Meeting of the Parties had invited parties to submit to the Secretariat information in relation to centres of excellence for sustainable cooling and testing centres for energy efficiency related to the implementation of the Kigali Amendment. The information provided by 23 parties, compiled by the Secretariat, was available on its website.

188. The representative of Rwanda reported on progress in preparations for the Thirty-Eighth Meeting of the Parties, which, she said, her party was honoured to host. The meeting would be an opportunity to celebrate what the Montreal Protocol had achieved while strengthening parties' collective commitment to implementation on the tenth anniversary of the Kigali Amendment. It would include a workshop, on 1 November, to mark the tenth anniversary, and an industry exhibition showcasing practical technologies, programmes and partnerships supporting sustainable cooling and cold-chain development, both hosted at the Africa Centre of Excellence for Sustainable Cooling and Cold Chain Systems.

189. A concise briefing note outlining the achievements, challenges and future opportunities associated with the first decade of the Kigali Amendment was in preparation by the Secretariat; a draft was available on the dedicated meeting website.² Parties and stakeholders were invited to submit case studies celebrating the achievements of the previous 10 years under the Kigali Amendment to help inspire continued ambition for the decade ahead. The Group of African States was preparing a declaration designed to celebrate the Kigali Amendment, reinforce the Multilateral Fund, advance sustainable and energy-efficient cooling and strengthen implementation capacity.

190. The representative of Senegal, speaking on behalf of the Group of African States, stressed the importance of the proposal for a declaration to mark 10 years of implementation of the Kigali Amendment. He welcomed the text's focus on universal ratification and implementation of the Amendment, the strengthening of the Multilateral Fund, and measures to combat illegal trade, improve energy efficiency, promote sustainable cooling and expand access to affordable climate-friendly technologies. For Africa, sustainable cooling was both an environmental priority and an imperative for development, essential for public health, food security, economic resilience and adaptation to climate change. He reiterated the importance of ensuring appropriate and predictable financial and technological support so that Article 5 parties could fully implement their commitments under the Kigali Amendment. He encouraged all parties to align themselves with the declaration.

191. All the representatives who took the floor congratulated Rwanda on its preparations for the meeting and said that they were looking forward to visiting once again the venue where the Kigali Amendment had been adopted. Many shared their happy memories of the intensive negotiations that had taken place at the time.

192. Responding to questions, the representative of Rwanda said that her party was working with the Secretariat to produce an information note on logistics, including visas and travel arrangements. The Government of Rwanda was taking all necessary measures to ensure that nothing hindered the organization of the meeting. She also committed to sharing the draft of the declaration with parties and said that she would engage with them regarding its contents.

IX. Other matters

A. Participation of the Central Asian States in the Group of Eastern European States

193. Introducing the sub-item, the representative of Kazakhstan, speaking also on behalf of Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, introduced a conference paper containing a draft decision on the continued participation of those countries in the Group of Eastern European States. Under the draft decision, the Thirty-Eighth Meeting of the Parties would invite the parties to continue recognizing and engaging the Central Asian States within the Group of Eastern European States and request the Secretariat to notify the parties of that decision.

² <https://ka-10.info>.

194. Recalling that at the Thirty-Seventh Meeting of the Parties some parties had proposed excluding the Central Asian States from the Group of Eastern European States, he noted that there was no legal basis for that exclusion, which would also contradict established practice under the Montreal Protocol, the principles of the United Nations and international law. No party had ever raised any formal objection to the continued recognition of the Central Asian States as members of the Group. Moreover, the uninterrupted participation of those States in the Group since 1991 implied acquired rights and legitimate expectations which merited due respect under international law. Any initiative to change the composition of regional groups under the Montreal Protocol would represent a clear violation of the equal rights of Member States of the United Nations and would be inconsistent with the principles of fairness, inclusiveness and consensus that had long guided work under the Montreal Protocol.

195. He stressed that the draft decision was not intended to set a precedent but solely to ensure that the current issue would be settled once and for all.

196. Several representatives expressed their support for the draft decision. One representative noted that the adoption of the decision would strengthen the Montreal Protocol, as it would ensure the continued and effective participation of all parties and underscore the importance of consensus-based decision-making, equitable participation and institutional continuity.

197. Several representatives underlined the fruitful and positive contributions made by the Central Asian States within the Group of Eastern European States, including through being nominated to represent the Group in various bodies under the Montreal Protocol. Several representatives said that excluding the Central Asian States from a regional group without their consent could constrain their ability to participate in the nomination and election of representatives to the various bodies of the Montreal Protocol, which was incompatible with the principles of sovereign equality and inclusivity and the equal representation of all States. In that regard, a number of representatives drew attention to the significant contribution of the Central Asian States in ensuring that the Eastern European States had been able to reach consensus on their recent nomination of Azerbaijan to serve as a member of the Implementation Committee until 31 December 2027.

198. One representative said that the only relevant question to ask those who proposed changing the composition of the Group of Eastern European States was how that change would contribute to more effective implementation of the obligations of parties under the Montreal Protocol and its Kigali Amendment. Any geographical considerations regarding the composition of the Group were irrelevant. Moreover, some representatives cautioned against politicizing the matter of regional representation. Several representatives expressed the view that any changes affecting the participation of States in regional groups needed to be carried out on the basis of transparent dialogue and consensus, as well as taking into account the interests of all the parties concerned.

199. One representative highlighted the geographical situation within the regions covered by the current membership of the Group of Eastern European States, as well as the long-standing historical, economic and environmental connections, including the close links between the Central Asian and South Caucasus regions, and shared experiences in the implementation of the Montreal Protocol, which, she said, supported the current composition of the Group.

200. Some representatives stressed that the Central Asian States were active and constructive members of the Montreal Protocol Network for Europe and Central Asia, which provided a strong institutional framework for cooperation in the region, in particular among technical experts. That cooperation had fostered the exchange of expertise, strengthened regional capacity and contributed significantly to the effective implementation of the Montreal Protocol and its Kigali Amendment across the region.

201. Several other representatives, including one speaking on behalf of a group of parties, expressed the view that it was not appropriate for the Open-ended Working Group to discuss the composition of the regional groups or for the Meeting of the Parties to take any decision in that regard. In the context of the United Nations, the regional groups operated on an informal basis; each regional group should determine its own membership, when it should meet and its nomination processes. One representative noted, however, that, on the basis of the principle of fairness, all the parties should belong to a regional group and the Groups of Eastern European States and of Asia-Pacific States should continue consultations on the matter of ensuring that the Central Asian States were part of a regional group under the Montreal Protocol.

202. Some representatives, including one speaking on behalf of a group of parties, said that a decision of the Meeting of the Parties on the membership of regional groups would not conform with the customs and practices of the United Nations and might set a precedent that could have unforeseen implications for other regional groups under the multilateral environmental agreements.

203. One representative clarified that no party had ever sought to change the membership of a regional group in the context of the United Nations. He said that his party had always been careful to base its actions on the neutral advice provided by the Secretariat. In that regard, he drew attention to the note by the Secretariat containing a summary of background information on membership of the Group of Eastern European States (UNEP/OzL.Pro.WG.1/48/INF/4/Rev.1–UNEP/OzL.Pro.ExMOP.6/INF/1/Rev.1) and noted that the document included a complete list of the Eastern European States.

204. One representative underscored that the composition of the regional groups under the General Assembly of the United Nations should not affect the composition of such groups under the Montreal Protocol and the Vienna Convention. A number of representatives, also drawing attention to the compilation of information in the note by the Secretariat, said that one of the conclusions therein was that other multilateral environmental agreements and forums had their own categorizations of regional groups and different rules on membership in their treaty bodies; some used the five United Nations regional groups, while others did not. In the light of that fact, established practice under the Montreal Protocol should guide consideration of the matter.

205. One representative said that both points of view, namely that the Central Asian States had historically been active members of the Group of Eastern European States of the Montreal Protocol and should remain so, and that those States were in Asia and were part of the Group of Asia-Pacific States in other United Nations forums, so should also be in that Group under the Montreal Protocol, were valid. He reaffirmed that the issue needed to be resolved by means of dialogue and consultation among the interested parties.

206. One representative said that his party, which was not a member of the Group of Eastern European States, would be willing to help facilitate the ongoing discussions on the issue, upon invitation by the Group. Another representative, speaking on behalf of a group of parties, expressed the view that the participation of parties that were not members of the Group in discussions on the margins of the current meeting would be helpful. Extensive discussions had taken place in the Group, with no sign of positions changing.

207. One representative said that the decision as to whether to remain in a given regional group or to move to another group was the sovereign decision of a State, and all five Central Asian States had made it clear that they wished to remain in the Group of Eastern European States. No further discussion on the matter was therefore needed. In that regard, another representative said that, given the importance of the sovereign rights of Member States, it seemed wrong that a regional group, which was secondary in importance to a Member State under international law, should be permitted to deny the sovereign right of a Member State to belong to its chosen regional group.

208. Several representatives cautioned against allowing a change to the membership of the Group, as that could set a precedent for a multitude of similar changes.

209. In response to a question from one representative, the Senior Legal Officer noted that the Secretariat did not participate in the meetings of the regional groups, nor did it keep any record of their meetings. Each regional group had the responsibility of determining, among other things, which States were members of that group, and decisions regarding admission to a regional group were made on the basis of consensus. He clarified that a party could not be forced out of a regional group. In the light of the response, a number of representatives said that it was clear that the Central Asian States should remain members of the Group of Eastern European States and the matter should be considered closed.

210. One representative, speaking on behalf of a group of parties, suggested that further consultations on the matter could be undertaken. One representative proposed that the name of the Group of Eastern European States be changed to the Eastern European, Caucasian and Central Asian States.

211. The Working Group agreed that members of the Group of Eastern European States and other interested parties would continue their discussions informally in the margins of the current meeting and that one of the proponents of the conference room paper would report back in plenary session on the progress made.

212. Subsequently, the representative of Armenia,³ reporting back on the informal consultations that she had facilitated on the issue, said that, although several proposals had been put forward during those consultations and considered by the participating parties, no consensus had been reached on the draft decision set out in the conference room paper or on a resolution to the issue as a whole.

213. The representative of Kazakhstan, speaking also on behalf of Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, reaffirmed the commitment of those States to continued cooperation with all the parties to the Montreal Protocol in a spirit of mutual respect, inclusiveness and constructive dialogue in accordance with international law and the principles of the United Nations. Furthermore, he reaffirmed the intention of those States to participate actively as members of the Group of Eastern European States. He noted that, as the proponents of the draft decision, those States were willing to withdraw it from further consideration once it was clear that the established practice of their membership in the Group of Eastern European States would be respected.

214. Several representatives, including some speaking on behalf of groups of parties, expressed appreciation for the efforts made by all the participants in the informal consultations who, in the spirit of cooperation, had tried to find a solution that would garner consensus, even though, regretfully, a consensus had not been reached.

215. Several representatives reaffirmed the importance of applying the principle of sovereign equality and equal rights of all parties, including that of a party to choose for itself to which regional group it belonged. A number of representatives recalled the positive contribution made by the Central Asian States over many years to the Group of Eastern European States, as well as the historical background to and practical reasons for the current composition of the group.

216. A representative speaking on behalf of a group of parties reiterated the view that decisions regarding the membership of a regional group should be decided within that group and that any changes in membership required consensus within the group. He said that, given the current discussion, he had the impression that no such consensus had been reached within the Group of Eastern European States.

217. One representative, speaking on behalf of a group of parties, expressed appreciation for all the contributions made in the informal discussions. He noted that those parties had put forward a pragmatic proposal regarding the nomination of the parties from Central Asia as representatives of Eastern European States based on consensus among the Eastern European parties and Central Asian parties. They considered the proposal to be balanced and able to accommodate the concerns expressed by all, very much in the spirit of cooperation and tradition within the Montreal Protocol family. Regrettably, that proposal had not been accepted. Regardless of the outcome, the representative thanked all the parties participating in the discussions. Another representative noted that the proposal would have been acceptable to his party if the wording had been amended slightly to ensure that the Central Asian States enjoyed the same rights as all the other participants in the Group.

218. One representative, recalling that the question of the membership of the Central Asian States in the Group of Eastern European States had been raised at the Thirty-Seventh Meeting of the Parties by one of the other parties in that Group, said that he failed to understand why several parties within the Group of Eastern European States had now adopted such a destructive approach. In response to that statement, another representative said that he had to clearly reject the unfair reference made by one party against his party, clarifying that his party had never sought to change the membership of United Nations regional groups, but had always carefully based its actions on the neutral advice provided by the Secretariat and had always acted in the spirit of cooperation.

219. One representative proposed that the name of the Group be changed to the Group of Eastern European and Central Asian States, as that would more accurately reflect the

³ Armenia was not a proponent of the conference room paper.

membership of the Group, would avoid any misunderstandings in the future and would not negatively affect the rights of any of the parties in the Group. He recalled that there was a precedent for such a name change, given that, in the context of the United Nations system, the Group of Asian States had changed its name to the Group of Asia-Pacific States in 2011 to more accurately reflect its membership. That change of name had been a straightforward process, with no reference to any issues of politicization during discussions of the decision, and the change had been made in the interests of equality among States and of common sense. He therefore had no choice but to conclude that the unwillingness of some parties to accept the sovereign right of the Central Asian States to remain members of the Group of Eastern European States or to consider changing the name of the Group was evidence of double standards and a discriminatory approach. In that regard, he requested that the Senior Legal Officer provide an assessment of the situation from a legal and disciplinary standpoint.

220. One representative expressed the view that consultations on the matter should continue at future meetings. Some representatives, however, said that, given the explanation provided earlier by the Senior Legal Officer that no party had the right to exclude another party from a regional group, the matter should be considered resolved and be closed.

221. The Working Group agreed to include the matter on the provisional agenda of the Thirty-Eighth Meeting of the Parties.

B. Nitrous oxide

222. The representative of Lesotho said that his proposal to discuss nitrous oxide stemmed from Annex I to the Vienna Convention, which defined nitrous oxide as an ozone-depleting substance, and from the 2022 quadrennial assessment report of the Scientific Assessment Panel, which had described a very large increase in levels of nitrous oxide, threatening stratospheric ozone. Nevertheless, following discussions in the margins of the current meeting among the members of the Group of African States, he was withdrawing his proposal to enable further consultations to be held, with a view to submitting a proposal at a future meeting.

223. Many representatives cautioned against any decision that would increase the scope of the Montreal Protocol and the already extremely heavy workload of Article 5 parties and could divert resources away from efforts to phase down HFC and to phase out HCFCs. Resources and capacity-building for those tasks were already vastly insufficient. One representative said that, although nitrous oxide could have an impact on the environment, the main sources were largely agricultural and were thus outside the scope of the Protocol. Limiting the use of nitrous oxide could have an impact on fertilizer production and increase the cost of agricultural production, thus affecting food security and countries' economic capacities. He said that he could never agree to proposals that created new commitments outside the scope of the Montreal Protocol; such issues could be addressed by other multilateral environmental agreements. Another representative recalled the existence of the Convention on Long-range Transboundary Air Pollution and its Protocol Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Fluxes. Rather than adding to the burden of the Montreal Protocol experts, it would be better to use the information already gleaned by experts under other processes.

224. Other representatives, including one speaking on behalf of a group of parties, thanked Lesotho for raising the matter and stressed the importance of taking a science-led and evidence-based approach, staying informed about emerging issues and seeing how their resolution could benefit from the experience built up under the Montreal Protocol. The representative speaking on behalf of the group of parties recalled that nitrous oxide would likely feature in the next quadrennial assessment report of the Scientific Assessment Panel, meaning that additional information would be available at that point.

225. One representative said that he looked forward to further consultations among representatives of African States with a view to a new proposal being submitted in the future.

226. The Working Group concluded its discussion of the sub-item on the understanding that the issue could be added to the agenda of future meetings of the Open-ended Working Group or a future Meeting of the Parties, in accordance with the rules of procedure.

C. Implementation of paragraphs 2 and 4 of Article 2J of the Montreal Protocol in respect of Azerbaijan

227. Introducing the sub-item, the Co-Chair drew attention to the addendum to the note by the Secretariat setting out a submission on consideration of the implementation of paragraphs 2 and 4 of Article 2J of the Montreal Protocol in respect of Azerbaijan (UNEP/OzL.Pro.WG.1/48/2/Add.2), which had been circulated at the request of Azerbaijan.

228. The representative of Azerbaijan introduced a conference room paper containing the text of a proposed draft decision. She explained that the recent ratification by Azerbaijan of the Kigali Amendment had given rise to a number of practical implementation issues arising from the new control measures for HFCs needing to be implemented in parallel with existing HCFC control measures, which aimed at phase-out by 2030. Those included, among others, the establishment of HFC baselines, the development of regulatory frameworks and licensing systems, sectoral transition planning and technology choices.

229. She said that she recognized that paragraphs 2 and 4 of Article 2J of the Montreal Protocol established differentiated implementation pathways for HFC phase-down commitments, which were designed to support a smooth transition while parties completed their HCFC phase-out obligations. The application of those provisions had in practice been addressed by Meetings of the Parties through decisions, including decision XXVIII/2 of the Twenty-Eighth Meeting of the Parties. Azerbaijan considered that the implementation factors arising in its own case were relevant to those mechanisms established under paragraphs 2 and 4 of Article 2J of the Montreal Protocol.

230. A number of representatives stated their agreement with the proposal. Others, however, while not necessarily disagreeing, asked for a more detailed justification. They said that they were open to the proposal but would appreciate receiving more information on its rationale.

231. One representative observed that the parties had never established criteria for the application of paragraphs 2 and 4 of Article 2J; those parties wishing to apply them had self-identified. It was therefore difficult to judge whether Azerbaijan should also qualify for the slightly different baseline formula and phase-down schedule set out in the paragraphs. He noted that while the other parties to which those paragraphs applied were in a similar situation to that of Azerbaijan – namely, they were non-Article 5 parties that had received support for implementation through the Global Environment Facility – he was not sure whether that in itself would provide sufficient justification.

232. Another representative added that there were other ways in which parties in a similar position could request assistance, for example by requesting support through the Implementation Committee. He also observed that since the HFC phase-down schedules in paragraphs 2 and 4 converged with those in the rest of Article 2J from 2029 onwards, it was not clear how much difference the decision would actually make.

233. The Co-Chair requested Azerbaijan to provide more information to those representatives who had asked for it, with the aim of deepening their understanding of the situation. The Working Group could then return to the discussion at a later stage.

234. Subsequently, the representative of Azerbaijan reported that she had held consultations with the interested representatives, who had indicated that further clarifications and information would be required for a better understanding of her delegation's submission. The Working Group therefore agreed to resume discussions on the implementation of paragraphs 2 and 4 of Article 2J of the Montreal Protocol in respect of Azerbaijan at the Thirty-Eighth Meeting of the Parties, on the basis of the draft decision set out in section II.C of annex I to the present report.

X. Adoption of the report of the meeting

235. The parties adopted the present report on the basis of the draft report that had been circulated, as orally amended. The Ozone Secretariat was entrusted with the finalization of the report.

XI. Closure of the meeting

236. Following the customary exchange of courtesies, the meeting was declared closed at 8.40 p.m. on Friday, 17 July 2026.

ADVANCE

Annex I*

Draft decisions to be forwarded to the Thirty-Eighth Meeting of the Parties

The Working Group agreed to forward to the Thirty-Eighth Meeting of the Parties, the draft decision contained in section I for possible adoption and the draft decisions set out in section II for further consideration, on the understanding that the draft decisions in section II did not constitute agreed text and were subject in their entirety to further negotiation.

I. Draft decision for possible adoption by the Thirty-Eighth Meeting of the Parties

Draft decision on destruction technologies for controlled substances

The Thirty-Eighth Meeting of the Parties,

Recalling that in decision IV/11 the Technology and Economic Assessment Panel is requested to evaluate emerging technology submissions and prepare recommendations for consideration by the parties to the Montreal Protocol on Substances that Deplete the Ozone Layer at their annual meeting,

Taking note with appreciation of the 2026 progress report of the Technology and Economic Assessment Panel's Medical and Chemicals Technical Options Committee, which contains an evaluation of a destruction technology submitted by Canada,

Taking note with appreciation also of the Technology and Economic Assessment Panel's evaluation of the destruction technology with regard to destruction and removal efficiency and of its recommendation that the technology be added to the list of destruction technologies approved by the parties,

Decides:

1. To approve the following destruction technology, as reflected in the annex to the present decision, for the purposes of paragraph 5 of Article 1 of the Montreal Protocol, as an addition to the technologies listed in annex VI to the report¹ of the Fourth Meeting of the Parties and modified by decisions V/26, VII/35, XIV/6, XXIX/4, XXX/6, and XXXV/5, for concentrated sources of Annex A, group 1, Annex C, group 1 and Annex F, group 1 controlled substances: steam plasma arc;
2. To invite parties to continue to submit to the Ozone Secretariat information relevant to a review of destruction technologies.

* The annex is presented without formal editing.

¹ UNEP/OzL.Pro.4/15.

Appendix

Destruction technologies and their status of approval

Technology	Applicability										
	Concentrated Sources							Dilute Sources			
	Annex A		Annex B		Annex C		Annex E	Annex F		Annex F	
	Group 1	Group 2	Group 1	Group 2	Group 3	Group 1	Group 1	Group 1	Group 2	Group 1	
	Primary CFCs	Halons	Other CFCs	Carbon Tetrachloride	Methyl Chloroform	HCFCs	Methyl Bromide	HFCs	HFC-23	ODS	HFCs
DRE	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	95%	95%
Cement Kilns	Approved	Not Approved	Approved	Approved	Approved	Approved	Not Determined	Approved	Not Determined		
Gaseous/Fume Oxidation	Approved	Not Determined	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved		
Liquid Injection Incineration	Approved	Approved	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved		
Municipal Solid Waste Incineration										Approved	Approved
Porous Thermal Reactor	Approved	Not Determined	Approved	Approved	Approved	Approved	Not Determined	Approved	Not Determined		
Reactor Cracking	Approved	Not Approved	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved		
Rotary Kiln Incineration	Approved	Approved	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved	Approved	Approved
Thermal Decay of Methyl Bromide	Not Determined	Not Determined	Not Determined	Not Determined	Not Determined	Not Determined	Approved	Not Determined	Not Determined		
Argon Plasma Arc	Approved	Approved	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved		
Steam Plasma Arc	Approved	Not Determined	Not Determined	Not Determined	Not Determined	Approved	Not Determined	Approved	Not Determined		
Inductively coupled radio frequency plasma	Approved	Approved	Approved	Approved	Approved	Approved	Not Determined	Not Determined	Not Determined		
Microwave Plasma	Approved	Not Determined	Approved	Approved	Approved	Approved	Not Determined	Not Determined	Not Determined		

	<i>Applicability</i>									
	<i>Concentrated Sources</i>							<i>Dilute Sources</i>		
	<i>Annex A</i>		<i>Annex B</i>		<i>Annex C</i>		<i>Annex E</i>	<i>Annex F</i>		<i>Annex F</i>
	<i>Group 1</i>	<i>Group 2</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Group 1</i>	<i>Group 1</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 1</i>
	<i>Primary CFCs</i>	<i>Halons</i>	<i>Other CFCs</i>	<i>Carbon Tetrachloride</i>	<i>Methyl Chloroform</i>	<i>HCFCs</i>	<i>Methyl Bromide</i>	<i>HFCs</i>	<i>HFC-23</i>	<i>ODS</i> <i>HFCs</i>
Nitrogen Plasma Arc	Approved	Not Determined	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved	
Chemical Reaction with H ₂ and CO ₂	Approved	Approved	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved	
Gas Phase Catalytic De-halogenation	Approved	Not Determined	Approved	Approved	Approved	Approved	Not Determined	Approved	Not Determined	
Superheated steam reactor	Approved	Not Determined	Approved	Approved	Approved	Approved	Not Determined	Approved	Approved	
Thermal Reaction with Methane	Approved	Approved	Approved	Approved	Approved	Approved	Not Determined	Not Determined	Not Determined	
Thermal decay of methyl bromide	Not Determined	Not Determined	Not Determined	Not Determined	Not Determined	Not Determined	Approved	Not Determined	Not Determined	

II. Draft decisions considered by the Open-ended Working Group at its forty-eighth meeting and forwarded for consideration by the Thirty-Eighth Meeting of the Parties

A. Strengthening Montreal Protocol operations

Submission by Cameroon on behalf of the Group of African States

The Thirty-Eighth Meeting of the Parties,

Recalling decisions XIV/7, XXXI/3, XXXIV/8, XXXV/12 and XXXVI/9,

Taking into account the one-day informal meeting on facilitating the implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer held back to back with the Thirty-Seventh Meeting of the Parties, and recalling the note by the Ozone Secretariat on the outcomes of the informal meeting,⁵

Decides:

1. *To request the Ozone Secretariat to prepare a report on the available tools that could be deployed to enhance tracking and monitoring of controlled substances across the supply chain, including on online marketplaces and e-commerce platforms, for consideration at the forty-ninth meeting of the Open-ended Working Group;*
2. *To also request the Ozone Secretariat to develop standard operating procedures to support a harmonized approach for detection of illegal trade, handling of cases, management of seizures, reporting, and sanctions for consideration by the Thirty-Ninth Meeting of the Parties;*
3. *To further request the Ozone Secretariat to prepare a checklist that defines core features of effective licensing systems, taking into consideration Article 4B of the Montreal Protocol and relevant decisions and reports, including the summary⁶ of common features of licensing systems in response to paragraph 1 of decision XXXVI/9, for consideration by the Thirty-Ninth Meeting of the Parties;*
4. *To request the Ozone Secretariat to explore the feasibility and cost of developing open-source licensing software that can be integrated into customs and single-window systems, for consideration by the Thirty-Ninth Meeting of the Parties;*
5. *To request the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, in consultation with national ozone officers and the Compliance Assistance Programme and, as appropriate, the World Customs Organization, to assess additional training and capacity needs in parties operating under paragraph 1 of Article 5 of the Montreal Protocol related to illegal trade, licensing systems and data reporting, for consideration at the forty-ninth meeting of the Open-ended Working Group.*

B. Strengthening licensing systems and data reporting to prevent illegal trade

Submission by Australia, Canada, the European Union, Norway and Switzerland

The Thirty-Eighth Meeting of the Parties,

Recalling decisions VII/9, IX/8, XIV/7, XVII/16, XIX/12, XXIV/12, XXX/12, XXXI/3, XXXIV/8, XXXV/12 and XXXVI/9,

Recalling also Article 4B of the Montreal Protocol on Substances that Deplete the Ozone Layer, which requires parties to establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances,

Recognizing the importance of effective import and export licensing systems in preventing illegal trade in controlled substances and facilitating compliance with the Montreal Protocol,

⁵ UNEP/OzL.Pro.37/7.

⁶ UNEP/OzL.Pro.WG.1/47/4.

Recognizing that strengthening verification practices and improving the quality and completeness of information related to the import and export of controlled substances can support more effective implementation and enforcement of the Montreal Protocol,

Taking note of the information prepared by the Ozone Secretariat on common features of licensing systems, notably in document UNEP/OzL.Pro.WG.1/47/4, and on illegal trade practices and approaches taken by national authorities to identify and address such cases, as compiled in document UNEP/OzL.Pro.WG.1/47/5 and updated in document UNEP/OzL.Pro.WG.1/48/3,

Taking note also of the outcomes of the one-day informal meeting on facilitating implementation of the Montreal Protocol held prior to the Thirty-Seventh Meeting of the Parties, as well as the background information paper for that meeting (UNEP/OzL.Pro.WG.1/45/5) and the summary of the outcomes of the meeting (UNEP/OzL.Pro.37/7) prepared by the Ozone Secretariat,

Taking note further of the analysis by the Ozone Secretariat of systemic issues in relation to compliance based on cases considered by the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, set out in annex II to the report⁷ of the Implementation Committee's seventy-fourth meeting,

Recalling that under decisions VII/9 and XXX/12, parties should report to the Ozone Secretariat the destinations of their exports of controlled substances, while reporting of sources of imports is voluntary and not done by many parties,

Decides:

1. To request the Ozone Secretariat to prepare, for information purposes, a list of the core features of licensing systems that is based on Article 4B of the Montreal Protocol and relevant decisions of the Meeting of the Parties related to licensing systems;
2. To urge parties that have not yet done so to inform the Ozone Secretariat as soon as possible whether their import and export licensing systems established pursuant to Article 4B of the Montreal Protocol cover used, recycled and reclaimed controlled substances, in addition to new controlled substances;
3. To encourage parties to ensure that their import and export licensing systems cover, as applicable, controlled substances that are in trans-shipment or re-exported, taking into account the clarifications on "trans-shipment" and "re-export" in decisions IV/14 and IX/34;
4. To request parties to ensure that their import and licensing systems control and accurately track the trade of controlled substances in free trade zones, and to report on any such imports and exports as part of their reporting under Article 7 of the Montreal Protocol;
5. To encourage the parties' national ozone units and customs officers to consider ways of efficiently sharing data in order to better track and monitor imports of controlled substances, including database coordination;
6. To encourage parties to strengthen verification practices for imports and exports of controlled substances, including, where feasible and appropriate, through the establishment of automated systems and standardized procedures that cross-check information reported by industry with customs data;
7. To remind parties operating under paragraph 1 of Article 5 of the Montreal Protocol that they can seek assistance from the Compliance Assistance Programme of the United Nations Environment Programme on the design and implementation of their national licensing systems;
8. To request parties to report, as part of their reporting under Article 7, the sources of imports and controlled substances, and to continue reporting on the destination of exports of such substances, with a view to helping the Ozone Secretariat identify differences between data reported by one party as imports and by another as exports, and vice versa;
9. To encourage parties to use the online reporting system for data reported under Article 7;
10. To request the Ozone Secretariat to make information available to the parties on those parties that did not report data required under Article 7 by 30 September each year;

⁷ UNEP/OzL.Pro/ImpCom/74/6.

11. To also request the Ozone Secretariat to liaise with the secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol on possible options for creating a coordinated approach to data reporting for data submitted under Article 7 and country programme data.

C. Consideration of the implementation of paragraphs 2 and 4 of Article 2J of the Montreal Protocol in respect of Azerbaijan

Submission by Azerbaijan

The Thirty-Eighth Meeting of the Parties,

Noting the ratification by Azerbaijan of the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, which entered into force for Azerbaijan on 22 February 2026,

Noting that the Kigali Amendment entered into force for Azerbaijan at a stage at which the phase-down framework under Article 2J was already operational,

Acknowledging that Article 2J of the Montreal Protocol establishes stepwise, differentiated phase-down pathways for hydrofluorocarbons, including as set out in paragraphs 2 and 4 of Article 2J,

Recalling paragraph 1 of decision XXVIII/2, in which the Meeting of the Parties addressed the application of paragraphs 2 and 4 of Article 2J to certain parties,

Recognizing the national implementation context of Azerbaijan, including the sequencing of control measures and the application of differentiated phase-down pathways established under Article 2J,

Decides:

To confirm that the phase-down schedules set out in paragraphs 2 and 4 of Article 2J of the Montreal Protocol are applicable in respect of Azerbaijan.

Annex II*

Other outcomes from contact groups presented to the Working Group

A. Suggestions for additional analysis in a supplementary report on the replenishment of the Multilateral Fund for the Implementation of the Montreal for the period 2027-2029

Outcome of the contact group

LVCs - VLVCs

Recalling the TOR in decision XXXVII/6, requests the RTF to provide a high-end scenario for a possible increase to the funding estimate in the resource allocation tables in chapter 3 for LVC and VLVC countries for Stage II of their KIPs, in consultation with the MLF secretariat, taking into account the capacity of those countries to absorb increased funding

Scenarios and methodological issues

- When estimating the funding requirements for HPMPs and KIPs, apply CE factors according to three scenarios: one based on historical CEs; a second one based on CE factors for each A5 party over the past 6 years; and a third one based on average funding levels for each A5 party over the past 6 years
- To request the Panel to present revised funding ranges with alternative scenarios that assess the impact of the following:
 - (a) A low-end scenario based on the most recently reported consumption data for HCFCs and HFCs and a high-end scenario based on established HFC baselines and HCFC remaining eligible consumption
 - (b) Realistic project implementation timelines such as modifying resources allocation schedule A for stage II KIPs and to take into account rates of ratification for remaining non-parties to the Kigali Amendment
 - (c) HFC-23 mitigation scenarios that account for the ongoing operating costs, IOC of approved MLF projects
 - (d) A low-end scenario for EE (decision 94/60) based on projects included in the business plan of the MLF and a high-end scenario reflecting full utilization of remaining funds in the 94/60 funding window aimed at promoting EE improvements in the context of the HFC phase down in the next triennium
 - (e) The distribution of funding across different levels of country consumption to address the needs of A5 parties to enable compliance is adequately reflected

ExCom 98 decision

Adjust all elements of the funding requirements based on relevant decisions taken at the 98th meeting of the Executive Committee and make any additional necessary updates to accurately reflect amounts in approved HPMPs and KIPs

LRM

Include a cost estimate for a high-end scenario for the potential funding window to be considered at the 100th ExCom meeting for the period 2027–2029 to support the implementation of national plans developed pursuant to decision 91/66, taking into account that activities to recover, recycle and reclaim refrigerants are also financed under HPMPs and KIPs.

* The annex is presented without formal editing.

B. Ensuring the viability of Montreal Protocol operations: scenarios, options and cost estimates (UNEP/OzL.Pro.WG.1/48/4 and UNEP/OzL.Pro.WG.1/48/4/Add.1)

Compilation of questions from the parties during the contact group discussions held on 14, 16 and 17 July 2026

Additional questions can be sent to the Secretariat (mea-ozoneinfo@un.org copy meg.seki@un.org and sandeep.bhambra@un.org) by 31 August 2026.

1. Rationale behind the paper presented including in the context of UN80 by providing a final report on work package 27 of UN80.
2. How were the scenarios derived? Were additional scenarios considered, and if so, why were they not included in document UNEP/OzL.Pro.WG.1/48/4?
3. Analyse the impact of the scenarios on Kigali Amendment implementation and compliance.
4. Additional information, especially cost estimates on use of AI and online meetings to further substantiate paras. 39 and 41 of document UNEP/OzL.Pro.WG.1/48/4.
5. Implications/consequences of adopting a scenario focusing on costs, quality, assessment work, compliance.
6. Cost savings if the meetings of the Implementation Committee were held for one day only, if held online, if held without interpretation.
7. Cost savings if OEWG were held for 3 or 4 days.
8. Suggestions to organise agenda of the meetings (OEWG and MOP) such that it can save on interpretation costs.
9. Tables 3 and 4 of document UNEP/OzL.Pro.WG.1/48/4/Add.1 to be combined. [N.B.: There was no meeting of the Technology and Economic Assessment Panel's replenishment task force in 2025.]
10. Present cost saving options under business-as-usual scenario.
11. Impact of the frequency of assessment panel work and meetings on assessments (quality). To be reviewed with TEAP.
12. Parties need to think about the programme of work over next decade and how the scenarios can help achieve the work.
13. In the history of the Secretariat's work were there times when the meetings' frequency was reduced and what was its effect on the work?
14. Possible to explore other source of funding for the Secretariat, e.g., from philanthropies or the private sector [through side events and exhibitions].

Annex III*

Summary of the presentation by the Technology and Economic Assessment Panel on the 2027–2029 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (Decision XXXVII/6)

1. Bella Maranion, co-chair of the TEAP Replenishment Task Force (RTF), started the presentation on behalf of her co-chair Suely Carvalho and the RTF. She elaborated on the mandate in decision XXXVII/6, which requested the TEAP to prepare a report on the appropriate level of the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (MLF) for the triennium 2027–2029. She reviewed key parts of the decision which provided the terms of reference (TOR) for the TEAP including but not limited to the following: that the TEAP would take into account all control measures and relevant decisions agreed on by the parties to the Montreal Protocol and the Executive Committee of the MLF (ExCom), including those relevant to decision XXVIII/2 and the decisions of the Meetings of the Parties (MOP) up to and including the MOP37 and of the ExCom, up to and including ExCom98, insofar as those decisions will necessitate expenditure by the MLF during the period 2027–2029; the special needs of low-volume consuming (LVC) and very low-volume consuming (VLVC) countries, taking into account relevant decisions of the ExCom pertaining to those countries; the need to allocate resources to enable all Article 5 (A5) parties to comply with the reductions and extended commitments under approved HCFC Phase-out Management Plans (HPMPs) and Kigali Implementation Plans (KIPs); integrating digital technologies and tools within the servicing sector; a scenario to allocate resources for funding to support a limited number of pilot projects to enhance regional atmospheric monitoring; a clearly explained compliance-based methodology that is informed by, but independent of, the business plan of the MLF, and that applies a range of cost-effectiveness (CE) figures for the manufacturing sectors based on historical experience rather than only on the CE thresholds approved by the ExCom; scenarios for varying numbers of A5 parties that have not yet submitted KIPs for phase down HFCs in advance of the Montreal Protocol targets on a voluntary basis; that, in preparing the report, the Panel should consult widely; that the Panel should strive to complete the report in good time before OEWG48; that the Panel should provide indicative figures for the periods 2030–2032 and 2033–2035 to support a stable and sufficient level of funding; and that the Panel should share the details of calculations in the form of an appendix as part of the report to enable parties to fully understand the Panel's analysis.

2. In terms of the approach taken by TEAP on its report, she mentioned that TEAP established a Replenishment Task Force (RTF) including expert members from the TEAP, its technical options committees (TOCs), and outside experts as well as a consulting expert. She noted that the 2027–2029 triennium and next two triennia represent significant milestones under the Montreal Protocol for ODS phase-out and HFC phase-down. The MLF will provide funding to A5 parties to complete the phase-out of HCFCs by January 1, 2030, a significant achievement under the Montreal Protocol. In this period, the MLF will also fund the first reduction steps for HFCs under the Kigali Amendment for both Group 1 and Group 2 parties. For Group 1 parties, the compliance targets are 10% reduction from baseline by 2029 and 30% reduction by 2035. For Group 2 parties, the compliance targets are a freeze in 2028 and a 10% reduction by 2032. The RTF estimated funding requirements for the 2027–2029 and next two triennia take strictly into account the relevant compliance targets within these periods as requested by the decision.

3. She presented the timeline of the RTF to prepare its reports in 2026. To begin planning its work, the RTF met in February 2026 in Montreal, hosted by the MLF secretariat (MLFS) for which the RTF is grateful for the hospitality and the continued support of the secretariat for its work. The RTF submitted its current report in May, and attended ExCom98 in June in order to follow relevant discussions and decisions for replenishment. The RTF looks forward to the discussion of its report at this meeting and will submit its supplementary report in September for the consideration of parties for their November meeting. While the May 2026 RTF Report for OEWG48 is based on data and information available to the RTF as of April 2026 and ExCom97 decisions, the RTF supplementary report will consider, among other things: decisions and discussions from ExCom98, discussions from OEWG48 and guidance from parties, updates to Article 7 (A7) and Country Programme (CP) data, updates to status of Kigali Amendment ratifications, any other adjustments to the MLF database that

* The annex is presented without formal editing.

impact funding estimates, and any other relevant information and new data available to the RTF during preparation of its supplementary report (July-August 2026).

4. Ms. Maranion then turned to the funding for HCFC phaseout. HCFC phase-out funding requirement for this triennium was calculated considering that the large majority of HPMPs are addressing complete phaseout by 2030. Parties that wish to phase out HCFCs completely by 1 January 2030 must ensure through regulatory and policy measures that HCFCs would not be imported after that date, except for those 2.5% allowed for a servicing tail between 2030 and 2040, where required, consistent with the provisions of the Montreal Protocol. If the country is intending to have consumption during the period 2030–2040, modifications need to be made to its Agreement with the ExCom covering the period beyond 2030. Changes to the Agreement might affect targets but not funding levels. Accordingly, RTF assumed that all remaining consumption eligible for funding is to be addressed by 2030. Total funding to address HCFC phaseout compliance targets combine the costs of the HCFC production sector; the HCFC consumption sector (including energy efficiency (EE) projects for LVCs); and project preparation and verification costs. The task is not yet done as there is remaining consumption still to be addressed to complete the HCFC phaseout.

5. For the production sector, the total funding requirement for the 2027–2029 triennium is estimated at US\$ 23.54 million. Details can be found in section 2.9 of the report. Only one party (China) was considered for 2027–2029 funding.

6. For the consumption sector, the RTF HCFC compliance model can be found in Annex 1 of the report. The steps A-E followed in the RTF compliance model give a snapshot as of ExCom97 for the estimated required funding. In step A, and as of the ExCom97, committed funding will support 116 A5 parties that had approved HPMPs with agreements for total phaseout by 2030. In step B, RTF considered new funding for three A5 parties had cancelled HPMPs, and RTF assumed they will re-submit their HPMPs for full phaseout in the next triennium. In step C, RTF considered the committed funding for HPMP stages approved and calculated estimated funding to address the remaining eligible consumption for parties with agreements that are less than the 100% complete phaseout. Following the request in the TOR, RTF presents two scenarios based on different Cost Effectiveness (CE) thresholds in manufacturing sectors; and calculated new estimated funding for LVCs separately, as per decision 74/50. The next few slides detailed step C for the 15 non-LVC parties as this provides the greatest impact on funding levels. In addition, the model takes into account steps D and E, the submissions under decision 89/6 for EE in LVC parties, and all new project preparation and verification costs, respectively.

7. Under Scenario 1, CE thresholds used for manufacturing sectors are detailed in the document (in Annex 2 of the RTF report) named “RTF analysis of document ExCom 89/10/Rev.1”. RTF filled CE gaps for some case-by-case sectors. For China, RTF collected average CE per sector based on China’s investment projects listed in the document ExCom 89/10/Rev.1. For the other 14 parties, RTF collected average CE per sector for investment projects listed, excluding China’s projects. RTF applied US\$ 4.8/kg that is in cost guidelines for the servicing sector for all 15 non-LVC parties. Including support costs of 9.6%, under Scenario 1, the estimated funding for 100% consumption sector phaseout by the 15 non-LVC parties, applying historical CE for the manufacturing sectors, is US\$ 370 million.

8. Under Scenario 2, for all 15 parties, RTF used the upper limit CE thresholds for manufacturing sectors from HCFC cost guidelines and filled some CE gaps for sectors considered on a case-by-case basis. For the servicing sector, RTF applied US\$ 4.8/kg (cost guidelines). Including support costs of 9.6%, under Scenario 2, the estimated funding for 100% consumption sector phaseout by the 15 non-LVC parties, applying CE from cost guidelines for the manufacturing sectors, is US\$ 506 million.

9. After providing an estimated funding range by applying the two scenarios to 15 non-LVC parties for complete HCFC phase-out, the RTF also applied a 15% deduction in funding to manufacturing sectors to account for foreign ownership. PMU costs were not included pending guidance to be considered for supplementary report. Total funding estimations for the production and consumption sectors, including EE, project preparation and verification, were distributed using an RTF suggested resource allocation as follows: 90% funding in 2027–2029, and 10% funding for last tranche after 2029. For the consumption sector under a Scenario 1, the proposed funding allocation estimates US\$ 427.6 million for 2027–2029 and US\$ 59 million for 2030. For Scenario 2, the proposed funding allocation estimates US\$ 549 million for 2027–2029 and US\$ 72.5 million for 2030. The total estimated funding range for the HCFC production and consumption sector for 2027–2029 is US\$ 451–573 million and for 2030 is US\$ 82.5–96 million.

10. RTF co-chair Ms. Carvalho then began her presentation of the estimated funding for the HFC phase-down. She noted that the RTF TOR requests funding estimates for three triennia (2027 to 2035), and the control targets that fall in 2027 to 2035 period are: Group 1 (G1) is 10% reduction by 2029 and 30% by 2035; Group 2 (G2) is a freeze by 2028 and 10% by 2032. RTF estimated funding for G1 parties (Kigali Implementation Plan (KIP) Stage I and II) and for G2 parties (freeze and KIP Stage I), under two scenarios: Scenario 1 with CE values applied without apportioning for small- and medium-sized enterprises (SMEs) and Scenario 2 with CE values applied apportioning for SMEs. For each scenario, total funding is allocated among three triennia, as per resource allocation Schedules A and B.

11. Ms. Carvalho then outlined the steps in the RTF HFC consumption sector compliance model as detailed in Annex 4 of the report. In step 1, as of ExCom97, there were 83 parties in G1 with approved KIP-Stage I with different agreed % reduction from the baseline. The model addressed: a) the committed funding for all 83 approved KIPs-Stage I; and b) the new funding for KIP-Stage II for 70 (of the total 83 parties) that have HFCs reductions below 30% of baseline. There were 13 parties with reductions equal to or above 30%, and RTF did not include these in its estimated funding, as they were already funded to reach reduction targets beyond 2035. In step 2, there are 42 parties in G1 and G2 without approved KIP-Stage I that ratified the Kigali Amendment: a) for G1, new funding is estimated for 36 A5 parties to submit KIP-Stage I and Stage II (10% by 2029, and 30% by 2035); and b) for G2: new funding to six parties to address the freeze by 2028 and the 10% reduction by 2032. For step 3, there are 19 parties that have not yet ratified the Kigali Amendment; RTF forecasted 100% ratification in 2027-2029: a) for G1, new funding for 16 A5 parties; and b) for G2, new funding for three parties. For the 2027-2035 period, the estimated total funding range covering Stage I and II for the two scenarios is US\$ 2,190–2,256 million.

12. Ms. Carvalho showed the percentage sector distribution of consumption derived from A7 data reported per party by chemical, in the absence of robust CP data. RTF grouped countries in clusters, based on baseline consumption level, that is, the party with highest baseline, followed by the 10 largest and so on. G2 parties were considered separately. She also presented the sector CE thresholds applied for Scenario 1 (with proportioning for SMEs) and Scenario 2 (with proportioning for SMEs).

13. She then presented the RTF proposal on two suggested resource allocation schedules, A and B, among the three triennia. For schedule A, RTF considered that G1 parties with Stage I approved may be ready for Stage II in the next triennium, and the funding needed for Stage II can be distributed 60% in 2027–2029 and 40% in 2030–2032. For Schedule B, 60% /40% proportion would be allocated, but as of 2030 and beyond. This is not 60% of the parties but 60% of the funding for those parties that will be in the triennium. Allocation proposals can be adjusted accordingly, by counting on the expedited approval of a portion of KIPs Stage II in the next (2027–2029) triennium as in A, or leaving Stage II KIPs to be funded in the next two triennia as in B. For G1 parties without any KIP, there is urgency to fund 100% of KIP Stage I in the next triennium to meet 10% reductions by 2029.

14. Schedule B is similar to A but considered 10% of last tranche to be paid in 2030–2032. Those parties may also need to expedite Stage II KIP to reach 30% reduction by 2035, unless they agree to go beyond the 10% reduction in Stage I.

15. For G2 parties without KIPs, Schedule A is similar to the one for G1 parties with KIPs Stage I approved. Schedule B funding will be available in 2030 and may be too slow for G2 parties to meet 10% reduction by 1 January 2032. It is also important to clarify that RTF has not considered funding for Stage II for G2 parties to achieve 20% reduction by 2037 as it falls outside the three triennia that RTF was requested to cover.

16. To summarize the HFC consumption sector compliance model assumptions, Ms. Carvalho stated that RTF considered ExCom decisions as of the 97th meeting, MLFS data provided as of January 2026, and Ozone Secretariat A7 and baseline information data, as well as the ratification status of parties as of 8 April 2026. The RTF assumed that the 19 parties that have not yet ratified the Kigali Amendment as of April 2026 will ratify in the 2027–2029 triennium. RTF also based its calculations on reductions from the baseline and allocated the 65% HCFC consumption in the servicing sector. RTF found data gaps and inconsistencies both in A7, baselines and CP reporting and addressed gaps using the methodology described in chapter 3.4.2 and Annex 3 of the report. The request in paragraph 4 of RTF TOR “to prepare scenarios for varying numbers of parties to submit KIPs for phase-down HFCs in advance of targets on a voluntary basis” was challenging. RTF suggested resource allocation schedules A and B as a way to respond, which can be adjusted if parties so wish. RTF welcomes parties’ suggestions and guidance on the schedules for the supplementary report.

17. The RTF considered separately the EE funding requirement for the 2027–2029 triennium. The ExCom has established four complementary funding pathways covering servicing, manufacturing, and end-user applications: Decision 89/6 supported additional EE activities within HPMPs for LVCs; Decision 91/65 established an augmentable US\$20 million pilot window for EE projects, including technical assistance and capacity building in countries without manufacturing sectors; Decision 95/87 extended the submission period to ExCom-100, but only for servicing-sector activities; Decision 94/60 created an augmentable US\$100 million incentive-based window for improving EE in manufacturing; and Decision 95/87 established a separate US\$ 40 million pilot window for two end-user projects using revolving-fund mechanisms. Overall, the RTF estimated EE funding needs of approximately US\$ 75.9 million at the low end and US\$133.5 million at the high end, including support costs, for the 2027–2029 triennium. The range reflects uncertainty over project demand, possible augmentation of existing windows, and implementation of the revolving-fund pilots. EE support now constitutes a portfolio of complementary instruments across servicing, manufacturing, and end-user applications.

18. The RTF TOR requests a “scenario to allocate resources for a funding modality to support a limited number of pilot projects to enhance regional atmospheric monitoring of substances controlled by the Montreal Protocol.” Assuming the establishment of a funding window at ExCom98, the RTF estimated funding for the 2027–2029 and 2030–2032 to support three stations over a five-year period. Decision taken at ExCom98 will be considered in RTF supplementary report. Details can be found in the Report in Chapter 10 and Annex 8.

19. For Scenario 1, all funding components included in calculations is the committed and new funding for different stages of KIP and for countries pending ratification. It includes project preparation, verification, EE and atmospheric monitoring funding windows. The total for the three triennia is US\$ 2.32 billion and suggested funding allocations A and B were shown. For Scenario 2, committed and new funding for different stages of KIP and for countries pending ratification, project preparation, verification, EE and atmospheric monitoring estimated funding total for the three triennia is US\$ 2.45 million and suggested funding allocations A and B were shown.

20. The estimated funding requirements for the HFC production sector and HFC-23 mitigation activities were presented. For the HFC production sector, as both China and India were significantly below the 10% reduction/freeze target from baseline for G1 and G2 parties, RTF considered only project preparation funding for the 2027–2029 triennium, with no investment funding. For HFC-23 mitigation, RTF estimated funding requirements for two parties (Argentina and Mexico) with approved HFC-23 phase-down plans; and HFC-23 mitigation project preparation and investment project funding for two additional parties (China and India) for the 2027–2029 triennium.

21. The RTF estimated the funding requirements for institutional strengthening, UNEP’s Compliance Assistance Program (CAP), the core unit of UNDP, UNIDO and the World Bank, MLFS, ExCom operation, monitoring and evaluation, and treasurer functions. The funding estimates presented were informed by ExCom decisions and reports, the MLF business plan, and in consultation with the MLFS.

22. The range for the total estimated funding requirement replenishment of the MLF for the 2027–2029 triennium is US\$ 1.28–1.36 billion for the low-end and US\$ 1.67–1.76 billion for the high-end.

23. Ms. Carvalho noted that there were some portions of RTF TOR that required RTF, for instance, to consider the special needs of LVCs and VLVCs, and integrating digital technologies and tools in the servicing sector. For LVCs, special needs were considered under Chapter 6 without computing any additional funding beyond what is decided by ExCom decisions. LVCs funding is computed but based on current agreed cost framework for Stage I KIP, for which a review is expected in 2028. For integrating digital technologies, RTF offers some key recommendations and estimated costs, which were not computed as part of the total required funding, and RTF is open for guidance from parties. LRM funding requirements were not included in our TOR, but RTF offered some cost elements that may be useful in future ExCom deliberations. If ExCom approves guidelines, there will be funding implications in the next triennium.

24. Bassam Elassaad, member of the RTF and TEAP Senior Expert and RTOC member, presented on the special needs of LVCs and VLVCs. The RTF identified challenges by V/LVCs in the implementation of HPMPs and KIPs that to include, among others, the uptake of new technologies, the lack of demand side management programs, and insufficient funding to transform markets, and suggested approaches to harmonize activities and focus efforts. For this report, RTF considered two issues in providing funding from the limited amounts available from KIP stage I for the various categories of V/LVCs that impact their ability to transition out HFCs into low-GWP alternatives and energy efficient systems: 1) issue related to system-building activities incurred at fixed costs

irrespective of the level of consumption or funding bracket; and 2) issue related to technician training cost and its share of the total funding provided.

25. The fixed system-building costs vary between 30% and 60% of the total funding, while training related activities take up between 16% and 26%, leaving little funding for other activities to support the technology transition while maintaining existing HFC-based systems. The situation is more accentuated for the first three brackets of LVC funding with the lowest bracket including VLVCs.

26. RTF compared funding available to V/LVCs in the period up to 2029 which is covered by the last stage of HPMP and the first stage of KIP to what would be needed for KIP stage II to maintain the same funding for the next step and provided an example of what this funding would look like if the first three categories of countries were funded at the same level. The combined funding can be almost three times what was provided for KIP stage I. Chapter 6 of the report includes the analysis and the elements corresponding to these figures.

27. Omar Abdelaziz, member of the RTF and RTOC co-chair, presented information related to the TOR request for TEAP to consider how digital technologies could be integrated into the refrigeration, air conditioning, and heat pump (RACHP) servicing sector. Chapter 9 distinguishes between digitization, which replaces paper-based processes with software, and digitalization, which changes how servicing work is delivered and managed. The report organizes these tools into three tiers. The first is transaction-efficiency improvement. This includes digital technician certification and registries, training management, service records, scheduling, and field-service applications. These tools can improve traceability, reduce administrative burdens, and are generally suitable for broad application, including in LVC and VLVC countries.

28. The second tier is performance tools, such as digital job-quality tools, remote monitoring, and Internet-of-Things applications. These can support better diagnostics, fewer repeat visits, improved first-time fix rates, reduced refrigerant leakage, and improved energy efficiency. However, they should be applied selectively where the technical capacity, connectivity, and expected benefits justify the cost.

29. The third tier covers workflow and knowledge tools, including larger platforms for training content, technical guidance, remote support, and knowledge management.

30. Indicative costs were then provided. Transaction-efficiency systems may require up to US\$50,000 upfront, with ongoing costs of roughly US\$50 to US\$200 per technician per month. Performance tools may require around US\$10,000 upfront, plus up to US\$200 per technician per month. Larger workflow and knowledge platforms may cost up to US\$1.25 million, with ongoing costs of approximately US\$25,000 per month.

31. These figures were illustrative and vary substantially by scale, localization, connectivity, and support requirements. Importantly, the RTF did not include these costs in its servicing-sector funding estimates or in the overall replenishment requirement. The key recommendation is to integrate digital tools into existing servicing programmes rather than create stand-alone systems. Priority should be given to low-cost, high-impact tools; existing platforms should be used where possible; long-term ownership and sustainability should be built in; and results should be measured through outcomes such as reduced leakage, improved energy efficiency, stronger compliance documentation, and better servicing quality. The report also includes some relevant case studies for the parties' considerations.

Annex IV*

Summaries of presentations by the Technology and Economic Assessment Panel

1. Under agenda item 4, Marta Pizano, co-chair of the Technical and Economic Assessment Panel introduced a presentation on the panel's 2026 Progress Report on behalf of fellow co-chairs Bella Marañon and Ashley Woodcock, as well as the TEAP members. She provided an outline of the presentation and thanked over 150 experts working on TEAP, its TOCs and TSBs for their voluntary contributions in preparing this report.

A. Fire Suppression Technical Options Committee

2. Initiating their presentation, the Fire Suppression Technical Options Committee (FSTOC), co-chaired by Adam Chattaway and Dan Verdonik, presented their 2026 progress report. Making reference to the current status of fire suppression agents, Mr. Verdonik reported that no new fire suppression or extinguishant agents are currently under active development. Should a new agent be identified, which the FSTOC believes to be unlikely, the Committee estimated it would require at least ten years for full commercialization. The situation regarding halon alternatives in civil aviation remains unchanged, with both aircraft engines and cargo compartments continuing to rely on halon 1301.

3. The ongoing HFC phasedowns are creating significant price pressure on higher-GWP (Global Warming Potential) HFCs used in fire suppression applications. This is particularly concerning because these HFCs represent the only available halon alternatives in certain applications. In response to these pressures, some parties are increasingly adopting inert gases as alternatives to HFCs. However, these inert gas systems present their own challenges, requiring substantially more space and adding considerable weight to installations.

4. Whilst very high-pressure systems – operating at up to 300 times atmospheric pressure – can help reduce both weight and space requirements, a critical infrastructure gap exists. The capabilities necessary for refilling high-pressure fire suppression systems are not available in many parties, particularly Article 5 parties. This limitation is especially problematic because the inability to refill a fire suppression system following a discharge or leakage fundamentally undermines the system's viability.

5. Turning to the Committee's response to decision XXXVII/4, Mr. Verdonik recalled that the decision specifically requests that the Ozone Secretariat liaise with the secretariat of the International Civil Aviation Organization (ICAO) regarding fire suppression agents controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer. The decision also calls for facilitating information exchange between the Technology and Economic Assessment Panel, through its Fire Suppression Technical Options Committee, and the relevant ICAO technical committees and working groups. This collaboration aims to enable the Panel to better assess the future use of and need for halons in civil aviation. The assessment should utilize available data on the locations of maintenance, repair, and overhaul operations authorized to service halons, data on future fleet evolution, and estimates regarding aircraft in operation with different types of halon fire protection systems. Additionally, the decision requests submission of a report on halon availability and the global distribution of halon banks, based on these activities, to the parties in advance of the forty-eighth meeting of the Open-ended Working Group.

6. Decision XXXVII/4 further asked the FSTOC to assess civil aviation halon needs. In this respect Mr. Verdonik reported that civil aviation installed quantities of halon 1301 are still increasing and are projected to continue growing for the foreseeable future. Current aircraft designs in production will rely on halon 1301 for at least 50 years, extending well beyond the FSTOC's projected run-out date for available halon supplies.

7. Continuing with the presentation, Mr. Verdonik said that the Committee's halon 1301 global emissions model continues to demonstrate good correlation with emissions derived from atmospheric measurements through 2024. This correlation is achieved when considering a 26% emission rate of feedstock production, which allows the run-out date estimate to align with FSTOC modelled global emissions from 2015 through 2024. ICAO adopted Resolution A-42, which encourages States to work with ICAO in liaising with the Ozone Secretariat and FSTOC to assess global halon reserves and

* The annex is presented without formal editing.

support the sustainable management of existing halon banks. Notably, this resolution includes consideration of an essential use nomination for halon 1301 in aircraft cargo compartments.

8. In response to both decision XXXVII/4 and ICAO Resolution A42-11, FSTOC continues working collaboratively with ICAO bodies to obtain better data to refine the run-out date projections. The current update incorporates the latest aviation data provided by ICAO bodies and the aviation industry, as well as information from the oil and gas sector, nuclear power plants, and shipbreaking operations.

9. The co-chair then referred to their analysis on available banks and run-out dates, and presented two analytical approaches for estimating halon availability and run-out dates: Approach 1 sets emission rates for all sectors except aviation. Under this approach, the available bank ranges from 4,170 to 9,296 tonnes. The set emission rates include 0.15% for Japanese systems, 1-2% for oil and gas applications, 0.1% for reserves, and 2-3% for other installed uses. This approach derives an aviation emission rate of 10-15%, resulting in a run-out date range of 2031 to 2039, with a midpoint estimate of 2035 (± 4 years). Approach 2 sets emission rates for all sectors except “other installed systems”. This approach estimates the available bank at 5,279 to 8,313 tonnes. The set emission rates include 0.15% for Japanese systems, 1-2% for oil and gas, 0.1% for reserves, and 8.5-12% for aviation. This derives an installed systems emission rate of 2-4%, resulting in a run-out date range of 2033 to 2037, i.e., a sub-set of Approach 1.

10. Reflecting on potential Essential Use Nominations, the FSTOC emphasized an important historical precedent: in 1993 and 1994, the Halon Technical Options Committee (HTOC) evaluated Essential Use Nominations (EUNs) and found that there were no nominations that could satisfy the requirement that halons are not available in sufficient quantity and quality from existing stocks of banked or recycled halons, as specified in decision IV/25. The FSTOC believes this finding remains valid in the near term. In support of ICAO Resolution A42-11 and recognizing the global nature of civil aviation servicing, parties may wish to consider determining what changes, if any, may be needed to the essential use nomination and evaluation processes. This consideration is particularly important given that most, if not all, parties will be unable to determine their annual civil aviation needs for aviation safety on an individual basis.

11. FSTOC and ICAO are working to foster greater collaboration between civil aviation authorities and ozone focal points. They are discussing the possibility of having both an ICAO State Letter cover and a UNEP cover for a joint statement or attachment. ICAO has provided the locations of maintenance, repair and overhaul operators (MROs) that might service halon 1301 aviation bottles. This information is crucial for understanding where civil aviation emissions originate and allows civil aviation authorities, aircraft manufacturers, and halon bottle manufacturers to focus their efforts on reducing emissions.

12. Mr. Verdonik continued by addressing MRO locations and emission hotspots. He said the Committee already had halon 1301 emission data from Europe, so they compared these known emission hotspots with known MRO locations in Europe that could perform halon 1301 services. The analysis aimed to determine if these hotspots correlate to halon 1301 activities, particularly MRO activities. There appeared to be some correlation to expected halon 1301 emitters. Notable locations included a facility in northern France that manufactures Fipronil and a location in south-east France where halon 1301 was previously made as a feedstock for Fipronil production. The Committee has requested similar emission hotspot data for other parts of the world to broaden this analysis. Reducing civil aviation emissions would extend the runout date further into the future, providing more time for civil aviation to develop an acceptable alternative. Given the uncertainty the aviation industry expresses about not having long-term ability to ensure its use of 2-BTP, the industry has stated it will not commit to using the 2-BTP/CO₂ blend to replace halon 1301 in cargo compartments. Under that scenario, it is difficult to imagine having enough halon 1301 to support new aircraft designs with a potential 100-year lifetime.

13. In ending his presentation, the co-chair stated that the FSTOC continues its work in several areas, including discussing the possibility to have an ICAO State Letter cover and a UNEP cover for a joint statement/attachment to raise awareness of the projected halon 1301 run-out date, and to encourage further collaboration between UNEP, the FSTOC and ICAO. The FSTOC is also gathering additional halon 1301 emission data, and collecting information from MROs, which serve as aircraft service centers critical to the halon servicing infrastructure.

B. Flexible and Rigid Foams Technical Options Committee

14. Helen Walter-Terrinoni, co-chair of the Flexible and Rigid Foams Technical Options Committee (FTOC) presented on updates in the Progress Report. Ms. Walter-Terrinoni noted that

parties are successfully transitioning the foam industry from hydrochlorofluorocarbons (HCFCs) in Article 5 (A5) and high global warming potential (high-GWP) hydrofluorocarbons (HFCs) in non-Article 5 (non-A5) parties and some A5 parties especially driven by regulations and changing supply chains. She noted that A5 parties continue to emphasize avoiding adoption of high-GWP HFCs where possible.

15. Manufacturers of hydrofluoro-olefin (HFO)/hydrochlorofluoro-olefin (HCFO) have increased capacity to meet the demand for lower GWP blowing agents (FBAs) that is expected to result from regulations. There have been improvements in the development and availability of additives, co-blowing agents, equipment and formulations.

16. Ms. Walter-Terrinoni explained that foam blowing agent economics continue to drive selection, blending and loading. She detailed that foam manufacturers continue to work to reduce costs with new FBAs and co-blowing agents in both A5 and non-A5 parties. She explained that significant resources are spent by foam manufacturers in optimising the foam characteristics and costs of new FBAs and foam systems through blends and new additives. She noted that there has been continued use of HFC-245fa blends in A5 parties due to cost of HFO/HCFO alternatives and there are no regulatory limits yet in many parties and that there are significant costs to requalify foams with new FBA blends through fire safety testing and efficacy (e.g., thermal performance, dimensional stability).

17. She noted that many companies have elected to transition away from fluorinated FBAs due to cost of HFCs, HFOs, and HCFOs, if they can still meet insulation performance and other criteria. Non-fluorocarbon components (e.g., hydrocarbon (HC), methylal, methyl formate, and methylene chloride) are blended with fluorocarbons (FCs) to reduce costs

18. Ms. Walter-Terrinoni noted that there are health and safety considerations of new FBAs, explaining that flammable FBAs and FBAs with different toxicity create different safety concerns for end-users and workers at system houses and foam manufacturers, especially small and medium enterprises (SMEs). She noted that the commercial adoption of HC foam blowing agents is increasing and that SMEs have reportedly adopted hydrocarbons FBAs without safety measures (non-sparking tools and practices, electrical upgrades etc.). She also noted that volatile organic carbon (VOC) restrictions may limit ability to use HC use, including in manufacturing sites.

19. She then commented that 1,2 dichloroethylene (1,2-DCE) toxicity and use in PU foam is currently being reviewed by at least one party. Field studies related to spray foam indoor air quality (IAQ) show 1,2-DCE concentrations for months or years after installation.

20. She finally summarized that despite challenges, parties were making progress in their transitions.

C. Methyl Bromide Technical Options Committee

21. On behalf of his fellow co-chair, Marta Pizano, the Methyl Bromide Technical Options Committee and TEAP, co-chair, Ian Porter, presented a summary of the committee's progress report. In responding to the finalization of the methyl bromide (MB) phaseout for controlled non-quarantine and pre-shipment (non-QPS) uses he noted that phase out was completed with the last critical use nomination (CUN) received in 2025. No new CUNs received in 2026. Together with the MB phase out achieved prior to the CUN process, 62,000 tonnes of MB have been phased out globally over 30 years.

22. Latest reported global production of MB for QPS (in 2024) was 8,935 tonnes, 900 tonnes greater than QPS consumption in that year. Atmospheric concentrations of MB have stopped declining as QPS uses and emissions continue unabated. Improved accuracy of reported data is essential for TEAP to be able to compare bottom-up and top-down estimates of MB emissions.

23. MB is highly toxic to humans, and increasingly subject to controls for occupational exposure. Several parties are introducing stringent reductions in permitted workspace exposure concentrations for MB which will impact future QPS uses (e.g. increased monitoring, larger buffer zones, etc.). He then showed a chart of the trends in MB consumption for exempted QPS uses for the top 10 major user parties including Australia, China, El Salvador, India, Japan, Mexico, New Zealand, Pakistan, USA and Vietnam. It was noted that these parties account for 88% of global use. India and the USA account for over 40% with India and Pakistan increasing consumption considerably over the last decade. China and New Zealand have sharply reduced consumption with New Zealand in particular reducing from 800 tonnes in 2021 to less than 40 tonnes over the last three years by implementing step down controls on emissions of MB with consequent adoption of alternatives.

24. It was then explained that quarantine (Q) MB uses are for specific quarantine pests (i.e., exotic pests, not occurring within a region/country) will likely be required in the long-term in many jurisdictions. And that pre-shipment (PS) uses which have been reported as ~3000 tonnes are for control of endemic pests (i.e., those already occurring within a country) which have effective alternatives to MB (e.g., hot and cold temperatures, irradiation, debarking of timber, phosphine, ethyl formate, hydrogen cyanide, ethane dinitrile). These alternatives are safer for humans, the environment, and the products being treated.

25. He stressed that over 6,000 tonnes of MB are emitted from QPS uses, but these can be avoided (as shown by changes in New Zealand). In closing he noted that parties may wish to consider how to reduce emissions from all QPS uses; limit MB exemptions for pre-shipment (PS) uses to encourage uptake of effective alternatives; focus on Q uses to ensure effective alternatives can be developed; and improve accuracy of reporting of MB volumes for Q versus PS uses.

D. Medical and Chemicals Technical Options Committee

26. Helen Tope, co-chair of the Medical and Chemicals Technical Options Committee (MCTOC) presented progress updates on behalf of co-chairs and members of the Committee. She reported that MCTOC had updated information on ozone-depleting substance (ODS) production for feedstock uses in the 2026 progress report, noting that feedstock uses are exempt from the Montreal Protocol's control measures. Total reported ODS production and imports for feedstock uses remained relatively stable at 1.95 million tonnes in 2024 compared with 1.97 million tonnes in 2023. She explained that the increase in feedstock production since 2020 has primarily resulted from greater use of lower ozone depletion potential (ODP) HCFC feedstocks, particularly HCFC-22. She explained that trends in ODP tonnes reflect changes in the mix of feedstock chemicals and their respective ODP values over time. While reported production in ODP tonnes reached a historical maximum in 1993, she noted that the 2022 peak remained below that level. She also highlighted an increase in HFC production for feedstock uses in 2024 from 2023, driven mainly by HFC-152a.

27. She then outlined MCTOC's evaluation of destruction technologies in response to a submission from Canada. She recalled the relevant Montreal Protocol decisions governing destruction technologies, explaining that while destruction of controlled substances is not mandatory, except for HFC-23, approved technologies are used for reporting destroyed substances within the Protocol's definition of production and consumption. She described how TEAP evaluates destruction technologies on the basis of destruction and removal efficiency and provides advice on emissions of other pollutants and technical capability, following assessment criteria developed by MCTOC. She reported that Canada had submitted a patented Steam Plasma Arc technology for evaluation and that MCTOC had assessed the technology on behalf of TEAP. Although technically similar to previously approved argon and nitrogen plasma arc technologies that can use steam, MCTOC considered Steam Plasma Arc to represent a distinct technology category. She noted that the supporting data covered a narrower range of controlled substances than existing approved plasma arc technologies and indicated that parties may wish to approve Steam Plasma Arc for destruction of concentrated sources of Annex A Group 1, Annex C Group 1, and Annex F Group 1 controlled substances for the purposes of the Montreal Protocol.

28. She also provided an update on developments relating to low- GWP propellants for pressurised metered-dose inhalers (pMDIs) in response to decision XXXVI/6. She noted that MCTOC would provide a more comprehensive assessment in its 2026 assessment report. She explained that pMDIs continue to account for approximately 70 per cent of prescribed respiratory treatment doses globally and emphasised that transitioning to lower-GWP propellants presents significant technical, regulatory, commercial, and patient-related challenges. These include maintaining product safety and efficacy, ensuring continued supply of pharmaceutical-grade HFCs, preserving the availability and affordability of alternative inhaler technologies, securing regulatory approvals, and achieving patient acceptance.

29. She reported that two lower-GWP propellants, HFC-152a and HFO-1234ze(E), are under development for use in pMDIs and that at least ten companies worldwide are actively developing products using one or both propellants, including manufacturers in Bangladesh, India, and Latin America. She highlighted that the first pMDI containing HFO-1234ze(E) had been launched in the United Kingdom and subsequently approved for use in Australia, Europe, and New Zealand, while additional products with new propellants had either been submitted for regulatory approval or successfully completed clinical studies.

30. Finally, she summarised the challenges associated with transitioning to lower-GWP inhalers in low- and middle-income countries, particularly Article 5 markets. She noted that persistent underlying issues relating to access, affordability, and healthcare infrastructure remain significant concerns, with

even modest increases in inhaler costs potentially limiting patient access. She explained that small and medium-sized manufacturers face additional challenges due to limited access to technology, investment, and regulatory expertise, potentially increasing global disparities in respiratory care. She observed that partnerships by small and medium-sized manufacturers with larger contract manufacturers could support continued supply while maintaining affordability. She concluded by noting that existing propellant suppliers in China and India could help ensure continued availability of pharmaceutical-grade HFC-134a during the transition, although HFC phase-down schedules and competing demand from the refrigeration, air conditioning, and heat pump sectors may create future supply and pricing pressures.

E. Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee

31. Co-chair Rajan Rajendran presented on behalf of the remaining three co-chairs, Omar Abdelaziz, Roberto Peixoto and Fabio Polonara. Mr. Rajendran started by presenting the update on crosscutting topics, followed by comfort cooling and heating and finally the cold chain & not-in-kind technologies. He then wrapped up the RTOC presentation by reviewing the updates on life-cycle refrigerant management (LRM).

Cross-cutting topics

32. The growing global demand for refrigeration, air conditioning, and heat pump (RACHP) systems creates a dual climate challenge from both direct refrigerant leakage and indirect electricity consumption, requiring comprehensive lifecycle assessments.

33. Reducing cooling and heating loads through passive measures such as insulation and shading is the most critical first step, capable of cutting cooling demand and energy consumption by approximately 30% and reducing the amount of refrigerant needed, enabling Kigali compliance.

34. There is no single “ideal” refrigerant; selection requires balancing multiple factors, including environmental impact, legal and regulatory obligations, safety requirements, performance, materials compatibility, component availability, affordability, and access to competent technicians.

35. Seven new blends were approved last year and are listed in Table 6.1 of the progress report.

36. Strengthening of national systems for collecting RACHP-related data would improve modelling accuracy on RACHP banks, consumption and emissions, and enable evidence-based mitigation.

37. Safety standards continue to be updated to include more types of systems as well as improve safety. The table from the progress report is reproduced below:

Table 6.2

Summary of current status of selected RACHP safety standards

<i>Standard</i>	<i>Scope</i>	<i>Latest status</i>	<i>Key developments</i>
ISO 5149 (series)	All RACHP systems	Under revision	Inclusion of new risk mitigation concepts (e.g., releasable charge, updated test methods)
IEC 60335-2-40	ACs, HPs	Under revision	Expanded provisions for flammable refrigerants, charge limits, mitigation measures
IEC 60335-2-89	Commercial refrigeration appliances	Under revision	Inclusion of split systems, small cold rooms using flammable refrigerants
ISO 14903	Component/system integrity	Revised (2025)	Updated methods for leak tightness qualification

Comfort cooling and heating

38. Mr. Rajendran continued his presentation on the topic of comfort cooling and heating by stating that extreme weather events and increased urbanisation in high ambient temperature countries increase demand for cooling equipment and associated direct and indirect emissions.

39. Reducing energy consumption is key in comfort cooling, with a global trend toward inverter compressors (for variable capacity). This technology remains under-represented in many A5 and some non-A5 parties.

40. Integrated systems for combined heating and cooling, common in larger district size heating and cooling applications, can improve overall energy efficiency by 30–50% and reduce CO₂e emissions by replacing fossil fuel heating.

The cold chain and not-in-kind technologies

41. In the next section on the cold chain and not-in-kind technologies, specifically in commercial refrigeration, there has been a significant shift away from R-404A toward CO₂ particularly in lower ambient temperature countries like those in Europe. In other regions, lower GWP A2L refrigerants are being adopted along with CO₂ and HC-290 in small charge systems. In industrial refrigeration, ammonia is preferred and CO₂ adoption is growing. Transport refrigeration faces slower transition due to safety, infrastructure, and long equipment lifecycles. Except for absorption and adsorption, non-vapour compression (not-in-kind) technologies remain at emerging or research and development stages.

Decision XXXVI/2: life-cycle refrigerant management

42. Mr. Rajendran concluded by reviewing updates on LRM. Decision XXXVI/2 from the Thirty-Sixth Meeting of the Parties requests TEAP to include updated relevant information on LRM in its 2025 and subsequent progress reports, including the 2026 quadrennial assessment report, taking into account discussions at the Thirty-Sixth Meeting of the Parties.

43. Servicing is critical to achieving both ozone protection and climate mitigation. Effective installation and proactive servicing enhance system efficiency, safety, and longevity. Rigorous refrigerant management directly reduces emissions, energy use, and lifecycle costs.

44. Servicing, however, faces a deepening skills gap. There is chronic shortage of trained technicians due to retirement of experienced technicians, insufficient training programmes and slow entry of new professionals. Technicians also need to be incentivised to recover refrigerant rather than release.

45. In the transition to lower GWP, flammable refrigerants (A2L and A3 refrigerants) are now mainstream. Safe handling requires specialised training in plume dispersion, ventilation, and leak detection, plus access to calibrated, explosion-proof tools. Standards exist for safe use of flammable refrigerants, but enforcement is uneven. Without enforcement of safety measures, the risk of accidents increases, potentially undermining confidence in lower GWP technologies. Growth in Internet of Things, and digitalisation have turned equipment into data-rich assets. Technicians now read real-time sensor data, moving from reactive calls to predictive and proactive maintenance. Hence, there is a need to retrain existing staff and new entrants on hybrid curriculum blending mechanical and electronics.

46. LRM has become an important policy tool supporting the Kigali Amendment through refrigerant inventory tracking, leak prevention, reclamation, and destruction. LRM could reduce refrigerant emissions in 2050 by ~50% under a Kigali-compliant scenario.

47. The EU, Japan, the USA are examples of parties with LRM policies, but their effectiveness depends on strong reverse supply chains, including refrigerant recovery, reclamation, and destruction. New Zealand is moving toward a new regulated product-stewardship and destruction scheme. Challenges remain in developing economies and small island states, where limited and diffuse reclamation and destruction capacity, weak cylinder return systems, and insufficient technician training constrain effective implementation.

48. The 2026 RTOC assessment report will provide more information on RACHP servicing and LRM.

F. Per- and polyfluoroalkyl substances

49. The section on PFAS was introduced by Mr. Woodcock. He started by saying that in public discourse, the term “PFAS” has become broadly equated with the term “forever chemicals”, which incorrectly implies long-term adverse impacts. There is a misconception that all PFAS and their breakdown products are persistent, bioaccumulative, toxins (PBTs).

50. He described two examples of long chain PFAS which are PBTs i.e., perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). PFOA and PFOS, which are prohibited in many jurisdictions, and under the Stockholm Convention. While PFOA and PFOS are not directly relevant to the Montreal Protocol, but they have driven broad regulations that could impact the availability of Montreal Protocol controlled substances and their alternatives. Montreal Protocol controlled

substances and their alternatives are not PBTs. Trifluoroacetic Acid (TFA) is a breakdown product of some HFCs and HFOs, and is considered a PFAS under some, but not all definitions.

51. He described the coordination between TEAP, EEAP and SAP on the scope of information on this topic to be covered by each panel's quadrennial assessment for 2026 and the 2027 synthesis report.

52. He showed how PFAS definitions drive different regulatory approaches. Individual PFAS chemicals have different toxicity, environmental impacts, and breakdown products. Contrasting regulatory approaches in different jurisdictions arise from the use of different PFAS definitions. On the one hand, classifying chemicals based on chemical structure rather than impact on health or environment, may result in a non-discriminatory ban of a broad range of chemicals, including Montreal Protocol controlled substances and alternatives. In contrast, regulations that have a narrow focus on specific PFAS with known PBT properties (e.g., PFOA and PFOS) exclude Montreal Protocol controlled substances and alternatives. Jurisdictions that adopt broad bans may limit available or planned alternatives to Montreal Protocol controlled substances.

53. Mr. Woodcock then described the potential impacts of broad PFAS regulations across the different sectors including Montreal Protocol controlled substances and their alternatives, certain fluorinated materials e.g., fluoropolymers widely used in equipment (e.g., compressors, valves, seals) foam blowing agents for foams (e.g., insulation), fire suppression (e.g., in aircraft), refrigerants in RACHP, aerosols, medical aerosols (e.g., MDIs), solvents, electronic manufacturing, and magnesium production. All of these may be affected by proposed and enacted regulations that incorporate broad PFAS definitions. He explained that the lack of certainty and timing of regulations was delaying investment in transition and could impact the Kigali timetable.

54. In civil aviation, the leading cargo compartment alternative is not viable for the long term as it contains 2-BTP, which is a PFAS under some definitions. As a result of the uncertainty, ICAO adopted Resolution A42-11 which removed the 2024 mandate to not use halon 1301 in cargo bays of entirely new aircraft designs. In other fire suppression sectors, a potential halon and high-GWP HFC replacement, HB-55, has been withdrawn. The uncertainty of the future of FK-5-1-12 (a PFAS) has led to the increased use of high GWP HFC-227ea, for example, in nuclear power plants.

55. In foam blowing, FBAs are application-specific according to structural or insulation needs. The number of FBA blends is increasing as manufacturers work to reduce costs while still achieving desired performance, and reducing available HFO/HCFO alternatives will make the FBA selection process more challenging. Some companies and other stakeholders are delaying decisions regarding selection of fluorinated alternatives to HFCs and HCFCs because of uncertainty about how it might be limited by proposed regulations.

56. The estimated global consumption of HFC propellants in pMDIs and other aerosols was 56,000 tonnes in 2021. Both manufacturers and patients will need to transition to lower GWP pMDIs because Annex F HFCs are being phased down under the Kigali Amendment. 50% of global pMDIs are made in Europe where F-gas regulations are proposed to limit availability of HFCs from 2030 onwards.

57. Two new pharmaceutical-grade lower GWP propellants, HFC-152a and HFO-1234ze(E); both will be needed. HFC-152a has about 0% of carbon footprint of HFC-134a and is also an Annex F HFC under the Kigali phase-down but it is not a PFAS. In contrast, HFO-1234ze(E) has less than 1% of carbon footprint of both HFC-134a and HFC-152a but comes under broad PFAS definitions. Inhaler transition is underway, but there is uncertainty about the long-term availability of lower GWP propellants. Dry powder inhalers (DPIs), soft mist inhalers (SMIs), and nebulisers provide suitable options for many, but not all, patients. There are over one billion patients with asthma and chronic obstructive pulmonary disease (COPD) whose health requires protection through continued availability of a range of affordable, accessible, and effective inhaled medications.

58. Mr. Woodcock then moved to the RACHP sector which accounts for approximately 90% of global HFCs subject to phase down under the Kigali Amendment. Refrigerant selection and transition pathways within this sector are central to achieving global climate objectives by phasing down high GWP HFCs and HCFCs. Alternatives include HCs, ammonia, CO₂, pure HFOs and HCFOs, as well as blends of lower GWP HFCs with HFOs or HCFOs and with CO₂ or HCs. Each alternative has advantages and limitations. Optimal refrigerant solutions are application specific. Non-fluorinated refrigerants can be used safely and effectively in many applications. However, their use is constrained in certain situations by factors such as flammability (e.g., HCs), toxicity (e.g., ammonia), high operating pressures (e.g., CO₂), and especially in medium and large capacity systems, types of applications, densely occupied buildings, retrofit applications, and certain geographic

regions. Broad PFAS restrictions could limit the use of lower GWP HFC and HFO refrigerants and blends and reduce the availability of fluoropolymer gaskets and seals which impacts all systems irrespective of refrigerant choice. This would also negatively impact heat pump uptake, reduce achievable energy efficiency in medium capacity RACHP systems, and most importantly slow down the achievement of Kigali targets.

G. Organizational issues

59. In closing the TEAP presentation Ms Pizano once again addressed the audience, to refer to decision XXXI/8 on TEAP procedures and organizational matters and decision XXXV/20 on options for the reorganization of TEAP and its TOCs. She recalled that parties have relied on the TEAP and its TOC experts in all areas of production, consumption and end-use of controlled substances. Expertise is the priority consideration for TEAP and TOCs, and the panel has generally been successful in recruiting and retaining the balance of voluntary expertise needed to address the issues facing parties. The mission of TEAP and its TOCs has evolved as the ODS phase-out and more recently the HFC phase-down have progressed. Accordingly, the membership has also evolved over the years to meet the issues faced by TOCs and the expertise needed to address these.

60. The work pattern of TEAP and its TOCs has changed towards on-line working, with benefits in terms of cost, organization and continuous working; however, it is clear that consensus requires mutual respect and trust which are hard to develop and maintain without meeting face to face. Thus, annual face to face meetings remain an essential part for TEAP/TOC function and consensus, and for preparing reports in a timely manner for the OEWG and MOP.

61. Ms. Pizano then stated that both TEAP and its TOCs face challenges as they strive to maintain required expertise within gender and geographical balance. Securing participation of volunteer experts with independent technical and economic expertise who need to be educated in TEAP's TOR, annual disclosure and conflict of interest requirements, process for consensus, and processes for developing, reviewing, and presenting reports is not easy.

62. She then pointed out that in addition, significant expansion of scope of discussions and decisions taken by parties due to the overlap of the ODS phaseout and HFC phasedown regimes has substantially increased TEAP's workload, within the same timeframes required for OEWG and MOP documents. Further, attrition of key members through retirement or discontinued support for their participation, may lead to loss of expertise for some TOCs. Many non-A5 experts do not have funding for travel and subsistence as some parties who do nominate experts do not cover such costs. For these reasons, addressing the funding of travel and subsistence of TEAP/TOC volunteers independent of A5/non-A5 status is critical to the consensus-based process of TEAP's work.

63. Ms. Pizano then referred to decision XXXV/20 which asked TEAP to provide options on the organization of the TEAP and its TOCs for discussion at OEWG47 (2025). She mentioned that during an informal group meeting held during MOP37 in Nairobi (November 2025), parties had requested TEAP to further elaborate on possible options for reorganization, particularly on the options preferred by each TOC to address future workload as of 2027. She proceeded to present these preferred options, stating that they reflect the current practicalities of managing near-term anticipated changes within the committees over the next few years (i.e., normal attrition, lack of support for participation, recruitment of new members) as well as gaining more experience, for the largest two TOCs, with working through subcommittees structures. She also clarified that these options can be revisited in the future as the needs of parties evolve, and mentioned that in its report TEAP had updated its matrix of needed expertise, indicating areas where gaps have been identified; she said that nominations from parties to meet such gaps would be very helpful to TEAP.

64. Referring to the preferred future TOCs configurations she said that **FSTOC** believes that the current configuration updated with new/replacement members and identifying an A5 co-chair is the best future option to meet the current and future needs of the parties. There have been substantial changes in the fire suppression sector, and in civil aviation and other enduring uses: it is increasingly likely that EUNs will be submitted in the future. **FTOC** on its part believes it is structured and sized appropriately, with sufficient expertise to support parties. Once foam-blowing agent transitions are complete, alternate structures such as reducing the size of the committee or reducing in-person meetings to alternate years could be considered. **MBTOC** opines that maintaining membership at about 15-20 including two co-chairs is the best option, ensuring continuity of expertise and preserving institutional memory. The Committee's focus will be on QPS and emissions, but expertise in controlled uses is retained.

65. **MCTOC's** preferred option is to restructure the committee with 4 co-chairs and about 40 members in 2 formal subcommittees: (1) Aerosols/Medical; and (2) Chemicals. Broad expertise on

HFCs and HFOs is currently required especially for the manufacture and supply of bulk propellant. MCTOC considers that other configuration options could be considered in the future if it becomes clear that the two subgroups could operate independently with the available expertise, without difficulty or loss of technical balance. Finally **RTOC**, currently operating as a single committee of approximately 40 members and four co-chairs, and supported by subcommittees is functioning very effectively. This arrangement fosters strong collaboration and consistently delivers high-quality outputs. Thus, the preferred option for RTOC's future configuration is to focus on cross-cutting aspects and general topics relevant to the RACHP sector while continuing to operate with two application subcommittees on: (1) Comfort cooling; and (2) Cold chain and other applications.
