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Eleventh meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer

Twenty-Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer

Montreal, Canada, 20–24 November 2017

Report of the combined eleventh meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer

Introduction

1. The combined eleventh meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer were held at the Conference Centre of the International Civil Aviation Organization in Montreal, Canada, from 20 to 24 November 2017.

2. The present report reflects the deliberations under the items included on the single agenda used for the combined meetings; any references to the current meeting should be understood to denote the combined meeting of the two bodies.

Part one: preparatory segment (20–22 November 2017)

I. Opening of the preparatory segment

3. The preparatory segment was opened by its co-chairs, Cheikh Ndiaye Sylla (Senegal) and Cynthia Newberg (United States of America), on Monday, 20 November 2017, at 10.10 a.m.

4. The parties were led in prayer by an elder from the community of Kanehsatà:ke, representing the Mohawk nation. He then presented the Minister of Environment and Climate Change of Canada, Catherine McKenna, with a gift of a piece of artwork representing the Tree of Life.

5. Opening remarks were delivered by Ms. McKenna, the former Prime Minister of Canada, Brian Mulroney, and the Executive Secretary of the Ozone Secretariat, Tina Birmpili.

6. In her statement, Ms. McKenna acknowledged the thirtieth anniversary of the Montreal Protocol, terming it the most successful international environmental treaty and likely to be the most successful international treaty ever. Between 1987 and 2010, the Protocol had led to the elimination of more than 135 billion tonnes of carbon dioxide equivalent and the phase-out of close to 100 ozone-depleting substances, and the ozone layer was healing. For countries endeavouring to tackle climate change, the Protocol carried the message of the importance of good science, of listening to

experts, of innovation and, most importantly, of leadership, and ultimately, the message that solutions could be found.

7. She announced that the Kigali Amendment had obtained the 20 ratifications that it required to enter into force, and more swiftly than expected. The Amendment was particularly important because the global community was endeavouring to keep global warming well below 2°C, and the work undertaken under the Amendment would represent a reduction of 0.5°C or more in the level of warming. If the world was truly determined to keep any rise in temperature below 2°C, it would, in particular, have to stop using thermal coal; Canada had begun to phase out coal and was taking other steps to put a price on pollution and foster innovation. Renewable energy sources such as solar and wind power were competitive with or less expensive than coal, and those countries that had not yet done so should join the Powering Past Coal alliance, announced at the twenty-third session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Bonn, Germany, in November 2017, and co-founded by Canada.

8. Mr. Mulroney, in his statement, welcomed the opportunity to help to celebrate the thirtieth anniversary of the Montreal Protocol. The only agreement under the auspices of the United Nations to have attained universal ratification, the Protocol had resulted from prioritized, proactive leadership from both the developed and the developing world. The Protocol not only had led to the elimination of more than 99 per cent of ozone-depleting substances, but also had avoided a quantity of greenhouse gas emissions five to six times higher than the target of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, which represented a huge value-added benefit.

9. After reviewing the history of the Montreal Protocol and the reasons for its success, he stressed that countries had an historic opportunity to ratify the Kigali Amendment, and their efforts in that regard would make a significant contribution to achieving the goal of limiting global warming to 2°C and meeting the targets of the Paris Agreement. As had been the case for the Protocol 30 years previously, political engagement and the involvement of industry could make the Amendment a success. In closing, he noted that the science of climate change was incontrovertible, with the past three years on record as the warmest in world history. He urged parties to minimize partisan lines as much as humanly possible in their effort to leave a better world and a more pristine environment to future generations, citing the agreement struck between Canada and the United States in the 1990s to curb acid rain as an example of how political engagement could be fostered to solve environmental challenges.

10. In her statement, the Executive Secretary reviewed the 30-year history of the Montreal Protocol, during which it had thrived on the interaction between science, policy and diplomacy, mobilized financial resources and prompted industrial research to pursue alternatives to chemicals that were thought to be indispensable. The Protocol's governance structure, with its assessment panels that helped nations to strengthen its provisions, public-private partnerships that disseminated new forms of technology, the Multilateral Fund for the Implementation of the Montreal Protocol that helped developing countries to acquire new technology, clearly defined targets and schedules for phasing out specific controlled substances and a compliance regime that facilitated compliance rather than punishing non-compliance, had remained essentially unchanged in 30 years and was a credit to its drafters, who had allowed for the tightening of existing controls and the inclusion of new measures.

11. On the thirtieth anniversary of the Montreal Protocol, parties could also celebrate the entry into force of the Kigali Amendment in 2019, with the conditions for entry into force having already been met. To date, 21 parties had ratified the Amendment, and the goal for the future would be universal ratification. Wide ratification would, among other things, allow assistance at the national level for technology transfer and to improve skills and maintain servicing sector employment that might otherwise be lost, as well as nurture national markets, inspire innovation and enhance competition globally.

12. Turning to the current meeting, she noted the science-policy linkage that connected the Vienna Convention and the Montreal Protocol. Scientists on the Scientific Assessment Panel and at the meetings of the Ozone Research Managers had always been able to translate science into solutions that policymakers could understand and use. She encouraged discussion of the monitoring-related issues raised at the tenth meeting of the Ozone Research Managers. The stratosphere was a critical part of the Earth's system, and continued observation and monitoring of ozone would reveal interlinkages with other major challenges such as climate change. She then reviewed other significant items on the agenda.

13. In closing, she paid tribute to Rolf Engelhardt (Germany), Gudi Alkemade (Netherlands) and Husamuddin Ahmadzai (Sweden), who were participating in a meeting of the parties for the last time after many years of distinguished service.

II. Organizational matters

A. Attendance

14. The eleventh meeting of the Conference of the Parties to the Vienna Convention and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol were attended by representatives of the following parties: Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bhutan, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Cabo Verde, Cambodia, Cameroon, Canada, Central African Republic, Chad, Chile, China, Colombia, Comoros, Cook Islands, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Czechia, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, European Union, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Holy See, Honduras, Hungary, India, Indonesia, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Latvia, Lebanon, Lesotho, Libya, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Maldives, Mali, Mauritius, Mexico, Micronesia (Federated States of), Mongolia, Montenegro, Morocco, Nepal, Netherlands, New Zealand, Niger, Nigeria, Norway, Pakistan, Panama, Paraguay, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Rwanda, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Solomon Islands, South Africa, South Sudan, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Thailand, the former Yugoslav Republic of Macedonia, Timor-Leste, Togo, Tunisia, Turkey, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Uruguay, Uzbekistan, Venezuela (Bolivarian Republic of), Viet Nam and Zimbabwe.

15. Representatives of the following United Nations bodies and specialized agencies also attended: International Civil Aviation Organization, secretariat of the Convention on Biological Diversity, 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, United Nations Information Centre, World Bank and World Meteorological Organization.

16. The following intergovernmental, non-governmental, industry, academic and other bodies were also represented: 3M Science Applied to Life; ACT Commodities; Air Conditioning, Heating, and Refrigeration Institute; Alliance for Responsible Atmospheric Policy; American Society of Heating, Refrigerating and Air-Conditioning Engineers; Cefic; the Chemours Company, China Household Electrical Appliance Association; China Refrigeration and Air-Conditioning Industry Association; Christian Aid; Climalife; Colorado State University; Council on Energy Environment and Water; Daikin; Energy Efficiency Services Limited; Environmental Investigation Agency-Global; European Environmental Citizens Organisation for Standardisation; European Partnership for Energy and the Environment; GIZ Proklima; Greenpeace International; Gujarat Fluorochemicals Limited; Hudson Technologies; ICF International; Industrial Technology Research Institute; Institute for Governance and Sustainable Development; Institute of Air Handling and Refrigeration; International Institute of Refrigeration; International Pharmaceutical Aerosol Consortium; Japan Fluorocarbon Manufactures Association; Japan Refrigeration and Air Conditioning Industry Association; Kigali Cooling Efficiency Programme; Kulthorn Group; Lawrence Berkeley National Laboratory; Lennox International; Mebrom; Mexichem UK Ltd.; Manitoba Ozone Protection Industry Association (MOPIA); Nagasaki University; Nagpur Chemical and Environmental Engineering; NASA Goddard Space Flight Centre; National Institute of Advanced Industrial Science and Technology; Natural Resources Defense Council; New York University; Oak Ridge National Laboratory; Oeko-Recherche; PRODUVEN; PureSphera; Quimobásicos S.A. de C.V.; Refrigerant Gas Manufacturers Association; Refrigerants Australia; Refrigeration and Air Conditioning Manufacturers Association; Shaffie Law and Policy, LLC.; SHECCO; TATA Motors Ltd.; The Energy and Resources Institute; The Gasana Group LLC; The Norris Group; University of Leeds; University of Massachusetts Boston; University of Southern California; Wagner Consulting; Walton Hi Tech Industries Ltd.

B. Officers

17. The preparatory segment was co-chaired by Mr. Sylla and Ms. Newberg.

C. Adoption of the agenda of the preparatory segment

18. The following agenda for the preparatory segment was adopted on the basis of the provisional agenda contained in document UNEP/OzL.Conv.11/1-UNEP/OzL.Pro.29/1:

1. Opening of the preparatory segment.
2. Organizational matters:
   (a) Adoption of the agenda of the preparatory segment;
   (b) Organization of work.
3. Financial reports and budgets of the trust funds for the Vienna Convention and the Montreal Protocol.
4. Montreal Protocol issues:
   (a) Replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol:
      (i) Supplementary report of the Technology and Economic Assessment Panel replenishment task force;
      (ii) Extension of the fixed-exchange-rate mechanism for 2018–2020;
   (b) Kigali Amendment to the Montreal Protocol to phase down hydrofluorocarbons:
      (i) Status of ratification of the Kigali Amendment to the Montreal Protocol;
      (ii) Data reporting under Article 7 of the Montreal Protocol, including related issues and destruction technologies for substances in Annex F to the Montreal Protocol;
   (c) Issues related to exemptions from Article 2 of the Montreal Protocol:
      (i) Nominations for essential-use exemptions for 2018;
      (ii) Nominations for critical-use exemptions for 2018 and 2019;
   (d) Use of controlled substances as process agents;
   (e) Key messages from the Technology and Economic Assessment Panel 2017 report;
   (f) Phase-out of hydrochlorofluorocarbons;
   (g) Energy efficiency (decision XXVIII/3):
      (i) Report by the Technology and Economic Assessment Panel on information submitted by parties on energy efficiency opportunities in the refrigeration and air-conditioning sector;
      (ii) Issues related to financial and technical support for energy efficiency in parties operating under paragraph 1 of Article 5;
   (h) Safety standards relevant to low-global-warming-potential alternatives;
   (i) Consideration of hydrofluorocarbons not listed in Annex F to the Montreal Protocol;
   (j) Nomination and appointment of co-chairs and members of the Technology and Economic Assessment Panel and its technical options committees;
   (k) Consideration of the membership of Montreal Protocol bodies for 2018:
      (i) Members of the Implementation Committee;
      (ii) Members of the Executive Committee of the Multilateral Fund;
      (iii) Co-chairs of the Open-ended Working Group;
   (l) Compliance and reporting issues considered by the Implementation Committee.
5. Vienna Convention issues:
   (a) Report of the tenth meeting of the Ozone Research Managers of the Parties to the Vienna Convention;

(b) Status of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention.

6. Other matters.

19. Under agenda item 6, "Other matters", the parties agreed to discuss two issues: (a) matters relating to paragraphs 6–8 of decision XXVIII/2, covering the relationship between hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs); and (b) the effects of the 2017 hurricane season in the Caribbean on efforts to implement the ozone treaties.

D. Organization of work

20. The parties agreed to follow their customary procedure and to establish contact groups as necessary.

III. Financial reports and budgets of the trust funds for the Vienna Convention and the Montreal Protocol

21. In considering the item, the parties had before them documents UNEP/OzL.Conv.11/4 and UNEP/OzL.Conv.11/4/Corr.1 and UNEP/OzL.Pro.29/4 containing the proposed budgets, together with the financial reports set out in documents UNEP/OzL.Conv.11/4/Add.1 and UNEP/OzL.Pro.29/4/Add.1.

22. The parties agreed to follow their standard practice and establish a budget committee to review the proposed budgets and the financial reports for the Vienna Convention and the Montreal Protocol trust funds and to prepare draft decisions on financial matters for the Convention and the Protocol. The Committee was facilitated by Jean Clarke (Ireland).

23. Subsequently, the facilitator of the budget committee presented draft decisions on the financial reports and budgets of the trust funds for the Vienna Convention and the Montreal Protocol, set out in conference room papers, which the parties approved for consideration and adoption during the high-level segment.

IV. Montreal Protocol issues

A. Replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol

1. Supplementary report of the Technology and Economic Assessment Panel replenishment task force

24. The co-chair of the Technology and Economic Assessment Panel's replenishment task force, Shiqiu Zhang, and the Co-Chairs of the Technology and Economic Assessment Panel, Bella Maranion and Lambert Kuijpers, made a presentation on the task force's supplementary report assessing the funding requirement for the replenishment of the Multilateral Fund for the triennium 2018–2020 (see UNEP/OzL.Conv.11/2/Add.1-UNEP/OzL.Pro.29/2/Add.1, annex I). A summary of the presentation prepared by the presenters is set out in the section B of annex VI to the present report.

25. The representatives who took the floor expressed their appreciation for the report and the work of the Panel and its task force.

26. Mr. Kuijpers, responding to questions raised, recalled that the Technology and Economic Assessment Panel had followed the mandate given to it by the Open-ended Working Group at its thirty-ninth meeting, held in July 2017, on the basis of the discussions held in a contact group during that meeting. For example, in relation to the zero-funding level in the triennium 2018–2020 for activities in stage III of HCFC phase-out management plans, the Panel had been asked to recalculate the funding requirements on the basis of the deferral of all stage III activities to the triennium 2021–2023.

27. Similarly, he said, the Panel had not been asked to take accelerated phase-out of HCFCs into account in its calculations. Nevertheless, several representatives highlighted the link between HCFC phase-out and HFC phase-down, and the overlap between future stage III of HCFC phase-out management plans and the first phase of HFC phase-down, which could lead to an acceleration in HCFC phase-out. Two of the representatives highlighted the benefits of addressing HCFCs and HFCs together in terms of cost efficiency and resource efficiency. Several representatives said that greater financial or capacity-building support needed to be made available to help countries to overcome the obstacles faced under stage II, including in terms of safety challenges, or to match the willingness of

countries to work on voluntary and accelerated phase-out or engage in enabling activities for HFCs. One representative stressed the importance of addressing the production sector in order to stem HCFC consumption at its source.

28. Mr. Kuijpers recalled that, within the triennium 2018–2020, the scheduled HCFC phase-out was the only compliance obligation. Parties were not required to accelerate phase-out further. One representative, underlining the extraordinary budgetary situation being experienced by his country, stressed the importance of ensuring that contributions to the Multilateral Fund were used as wisely as possible and that the Fund's limited resources were prioritized so that the countries most in need received adequate support. He also sought to ensure financial burden-sharing, expressing disappointment at the losses experienced as a result of the fixed-exchange-rate mechanism in recent years. He expressed the desire to explore options with regard to its use.

29. Responding to a query about the difference between the funding associated with planned activities and the level of approved funding, Mr. Kuijpers said that it was normal practice for there to be a discrepancy because the original estimates in the business plans became more accurate and refined over time. He noted, however, that, on the basis of the comparative figures for the period 2000–2017, there appeared to be no pattern or lessening of the discrepancy over the years. He suggested, therefore, that it was not a question of a learning process and discrepancies would continue to occur, owing to various factors. He also clarified that the uncertainty value of plus or minus 13.5 per cent was the range into which the majority of the percentages – themselves averages – fell for the years 2000–2017.

30. Given a related question about a reduction in funding for non-low-volume-consuming countries, he clarified that fluctuations in planned and approved funding amounts within a triennium were normal. Once the Executive Committee of the Multilateral Fund had approved funding for a project, the overall figure relating to planned projects would decrease by the planned amount and the overall figure for approved funding would increase by the approved amount. Similarly, if projects were delayed and the implementation of approved activities were postponed to a subsequent triennium, the total amount for approved projects in the current triennium would decrease.

31. He said that the Panel and the task force had no methodology for predicting the type and value of projects that would slip from one triennium into the next, although it always occurred. Calculation of the planned and approved projects from the triennium 2015–2017 that needed to be taken into account for the replenishment for the triennium 2018–2020 had been made on the basis of analysis of Executive Committee data and decisions. The exercise would not aid in predicting the situation at the end of the triennium 2018–2020 for the triennium 2021–2023.

32. Two representatives, one speaking on behalf of a group of countries, mentioned issues that they considered had not been dealt with sufficiently in the report or that required further clarification. Those were related to the assumptions and methodologies on which a number of the estimates in the supplementary report were based; cost-effectiveness as a factor in estimating funding needs; the estimated funding needed to avoid using HFCs while phasing out HCFCs, in line with paragraph 3 of the terms of reference for the report; the need for a clear differentiation in the report between the funding relating to HCFCs and that relating to HFCs; and more information on non-investment and supporting activities for HCFCs and enabling activities for HFCs.

33. The parties agreed to establish a contact group, co-chaired by Samuel Paré (Burkina Faso) and Davinder Lail (United Kingdom of Great Britain and Northern Ireland), to discuss the proposed replenishment further, taking into account the issues raised in the discussion.

34. Subsequently, the co-chair of the contact group introduced a draft decision, as set out in a conference room paper.

35. The representative of Belarus stated that he was unable to agree to the contribution set out for his country in the draft decision, although Belarus remained firmly committed to the implementation of the Montreal Protocol. It had made extensive efforts to carry out its obligations under the Protocol, including being the first country in Eastern Europe to adopt national legislation to phase out ozone-depleting substances. It had shared its expertise with other parties and had contributed as a donor to the Multilateral Fund. While Belarus wished to continue to help parties operating under paragraph 1 of Article 5 through the Multilateral Fund, however, given the current economic situation it would be unable to contribute the full amount that it had been allocated. He had warned, during the discussions on the adoption of the Kigali Amendment, in 2016, that Belarus would consider the proportion of its allocated contribution that related to the phase-down of HFCs to be voluntary. Accordingly, he requested that a footnote relating to Belarus should be added to the table of contributions included in the draft decision, indicating that, to avoid non-compliance, the difference

between $77,000 per year and the sum indicated in the table, $141,167 per year, would be considered a voluntary contribution to the Multilateral Fund.

36. The representative of Azerbaijan said that she too regarded the contribution allocated to her country in the draft decision, which represented an increase on previous contributions, as unaffordable. She asked for it to be reviewed.

37. The representative of the United States said that his Government has been the biggest donor to the Multilateral Fund since 1990. While he recognized that there was widespread support for the draft decision among the parties, his Government's budget request to Congress for the fiscal year 2018 was not commensurate with the level of funding contemplated in the decision, and Congress was still considering those funding levels. The United States' contributions to the Multilateral Fund were voluntary in nature and subject to appropriation decisions made by Congress. The United States believed that the issues that his delegation had raised during the deliberations of the contact group would require further consideration by the parties in the future.

38. A number of representatives observed that the contact group had faced many challenges, but had been able to overcome them thanks to a shared willingness to compromise and the trust engendered by working together for some 30 years.

39. The parties agreed to forward the draft decision for further consideration during the high-level segment.

2. Extension of the fixed-exchange-rate mechanism for 2018–2020

40. The Co-Chair recalled that for the past several replenishments the parties had provided for the use of a fixed-exchange-rate mechanism to help to facilitate payment. The Secretariat had prepared a draft decision on the matter (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. III.E, draft decision XXIX/[EE]).

41. One representative expressed her support for the fixed-exchange-rate mechanism as a means of providing donor countries with predictability so that they could make appropriate budgetary allocations into the future. Although there had been losses in recent years, in the past there had been substantial gains for the Multilateral Fund. The results were likely to be cyclical.

42. Another representative, while acknowledging the importance of the fixed-exchange-rate mechanism for certain countries, voiced his disappointment with regard to the losses incurred and the need to revisit the mechanism.

43. The parties agreed that the contact group established to discuss the replenishment would also consider the draft decision on the fixed-exchange-rate mechanism.

44. Subsequently, the co-chair of the contact group reported that the group had been able to reach agreement on a draft decision, as set out in a conference room paper. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

B. Kigali Amendment to the Montreal Protocol to phase down hydrofluorocarbons

1. Status of ratification of the Kigali Amendment to the Montreal Protocol

45. The Co-Chair recalled that at each meeting the parties reviewed the status of ratification of the ozone treaties. The parties had last taken such a decision in 2014, at the previous joint meeting, when all the ozone treaties had achieved universal ratification, save for the Beijing Amendment which was awaiting one final ratification. With the Kigali Amendment, the parties could revive a decision that recorded how many parties had ratified the ozone treaties and encourage further ratification. On 17 November 2017, the twenty-first instrument of ratification of the Amendment had been received, thus fulfilling the requirement for the entry into force of the Amendment on 1 January 2019. She drew attention to the two draft decisions that had been prepared (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. IV.A, draft decisions XI/[AAA] and XXIX/[AAA]).

46. In the ensuing discussion, several representatives congratulated those parties that had already ratified the Kigali Amendment and encouraged others to follow suit.

47. In the light of suggested changes to the wording of the draft decisions, the parties agreed that interested parties would meet in the margins of the meeting and submit a revised draft decision.

48. Subsequently, the representative of the United States orally introduced the revised draft decisions.

49. The parties agreed to forward the draft decisions for consideration and adoption during the high-level segment.

2. Data reporting under Article 7 of the Montreal Protocol, including related issues and destruction technologies for substances in Annex F to the Montreal Protocol

50. The Co-Chair recalled that, at the thirty-ninth meeting of the Open-ended Working Group, a contact group had been established to discuss the issues arising from the Kigali Amendment that were relevant to data reporting under Article 7 of the Montreal Protocol, including the process for deciding on destruction technologies for hydrofluorocarbons. The contact group had concluded its initial discussions on the data reporting forms and associated guidelines and on the issue of reporting of mixtures and blends containing hydrofluorocarbons. It had been agreed that the parties would be given time to submit detailed comments. The Secretariat had incorporated those comments and presented a revised set of forms for consideration (UNEP/OzL.Pro.29/7).

51. The contact group had discussed several other issues, namely, a timeline for reporting of baseline data for HFCs by parties operating under paragraph 1 of Article 5; reporting of trade with non-parties; global-warming-potential values for HCFC-141 and HCFC-142; and the approval of destruction technologies for hydrofluorocarbons, with regard to which a draft decision had been proposed and forwarded for consideration by the Twenty-Ninth Meeting of the Parties (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. II, draft decision XXIX/[A]).

52. The parties agreed to reconvene the contact group on data reporting and destruction established at the thirty-ninth meeting of the Open-ended Working Group, co-chaired by Martin Sirois (Canada) and Margaret Aanyu (Uganda), to continue its discussions, including on the draft decision.

53. Subsequently, the co-chair of the contact group reported that the group had been able to reach agreement on a draft decision on destruction technologies for HFCs, set out in a conference room paper. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

54. He also reported that, while the contact group had made good progress on the other items on its agenda, it had not been able completely to conclude its discussions and therefore proposed that the item should be included on the agenda of the fortieth meeting of the Open-ended Working Group. It should be noted that the group had been unable to reach a conclusion on the inclusion of data on HFC-23 in data form 6. It had spotted errors in the global-warming-potential values of the common isomers of HFC-123 and HFC-124, which had been transposed incorrectly in Annex F in the Kigali Amendment. It had further agreed that, in the forms and instructions for reporting trade in controlled substances with non-parties, all references to Annex F should be deleted. It had not, however, concluded its discussions on the timeline for reporting baseline data for parties operating under paragraph 1 of Article 5.

55. The parties agreed that the item would be included in the agenda of the fortieth meeting of the Open-ended Working Group and that the Working Group would decide how best to proceed thereafter. The Co-Chair suggested that the Secretariat could incorporate the contact group's observations when preparing the relevant documentation for that meeting.

C. Issues related to exemptions from Article 2 of the Montreal Protocol

1. Nominations for essential-use exemptions for 2018

56. The Co-Chair recalled that the Open-ended Working Group, at its thirty-ninth meeting, had heard a presentation by the Technology and Economic Assessment Panel on its evaluation of and recommendations on an essential-use nomination submitted by China for 65 tonnes of carbon tetrachloride for testing of oil, grease and petroleum hydrocarbon in water. The Working Group had forwarded a draft decision on the matter, submitted by China, for consideration by the Twenty-Ninth Meeting of the Parties (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. II, draft decision XXIX/[B]).

57. The representative of China observed that the draft decision still contained text that it would like to discuss further with interested parties. Several representatives commended China for its efforts to find alternatives to that particular use of carbon tetrachloride.

58. The parties agreed that interested parties would meet in the margins of the meeting and submit a revised draft decision.

59. Subsequently, the representative of China introduced a draft decision on the subject, set out in a conference room paper.

60. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

2. Nominations for critical-use exemptions for 2018 and 2019

61. The Co-Chair recalled that the Open-ended Working Group, at its thirty-ninth meeting, had heard a presentation by the Technology and Economic Assessment Panel on its initial review of the six critical-use nominations submitted by five parties. Several nominating parties had since submitted additional information to the Panel, bilateral discussions had been held and the Panel had met to conduct a final evaluation of the nominations.

62. The co-chairs of the Methyl Bromide Technical Options Committee, Mohamed Besri and Ian Porter, gave a presentation on the final recommendations for critical-use nominations for methyl bromide. A summary of the presentation prepared by the presenters is set out in section A of annex VI to the present report.

63. In the ensuing discussion, the representative of Australia said that, with regard to the comments of the Methyl Bromide Technical Options Committee on his country's critical-use nomination, his Government had worked well with the Committee for many years on the use of methyl bromide for strawberry runners; he expressed the hope that when the Committee next met, which would be in Australia in March 2018, it would have the opportunity to gain a deeper understanding of the challenges faced by his country. He stressed that both the Government and industry in Australia were fully committed to the development of effective alternatives to methyl bromide and had devoted considerable time and resources to research efforts to that end. The Australian regulatory process, which included specifications of both maximum and minimum uses, was rigorous in ensuring the suitability of chemicals to human health and the environment.

64. The representative of Canada, while expressing thanks to the Methyl Bromide Technical Options Committee for assessing his country's nomination, voiced concern over a number of the Committee's comments. He explained that Prince Edward Island was unique among Canadian provinces in relying on groundwater as its only supply of potable water, which explained why the use of methyl bromide for strawberry runners was permitted but the use of chloropicrin was not. While that did pose a regulatory barrier to the adoption of alternatives, the provincial government was entirely within its rights to decide how best to protect the health of its citizens. His Government was making substantial efforts to reduce the use of methyl bromide. A multi-year research project, which should lead to a significant reduction in use, was well under way, and he could provide interim results to the Committee.

65. Another representative said that there was a need to respect national and local policies and regulations, which were put in place for good reason. The individual circumstances of each critical-use nomination had to be taken fully into account.

66. One representative, speaking on behalf of a group of countries, recalled that those countries had been able to end the use of methyl bromide for all applications in 2010, which suggested that there were indeed alternatives to the substance in all circumstances. He congratulated China on its decision not to put forward any further critical-use nominations in future years and urged all other parties to adopt the alternatives suggested by the Methyl Bromide Technical Options Committee. He expressed the hope that the requirement, under decision IX/6, for parties not operating under paragraph 1 of Article 5 to demonstrate that research programmes were in place to develop and deploy alternatives and substitutes to methyl bromide would be taken into account in assessing future critical-use nominations.

67. Subsequently, the representative of Australia, also on behalf of Canada, introduced a draft decision on the subject, set out in a conference room paper.

68. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

D. Use of controlled substances as process agents

69. The Co-Chair recalled that, at its thirty-ninth meeting, the Open-ended Working Group had considered the recommendation of the Technology and Economic Assessment Panel and its Medical and Chemical Technical Options Committee that three items of process-agent uses be removed from table A of decision XXIII/7 and that the reference to the United States be deleted from item 4 in the table. The European Union had submitted a draft decision for consideration, which the Working Group had forwarded for consideration by the Twenty-Ninth Meeting of the Parties (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. II, draft decision XXIX/[D]).

70. In the ensuing discussion, one representative congratulated the parties on their progress in reducing the number of process-agent uses, from the original 44 to 14 and, if the recommendation were agreed upon, to 11. One representative observed that one of the uses remaining on the list, that of carbon tetrachloride for the recovery of chlorine by tail gas absorption from chlor-alkali, had been ended in his country in 2010 and alternatives to its use were available.

71. Subsequently, the representative of the European Union introduced a revised draft decision, set out in a conference room paper, which had been finalized after informal discussions with interested parties. Were the decision to be adopted, table A of decision X/14 would be updated, parties would be urged to update their information on the use of controlled substances as process agents and the Technology and Economic Assessment Panel would be requested to report on the industrial application of any alternative technologies employed by parties in the processes listed in table A.

72. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

E. Key messages from the Technology and Economic Assessment Panel 2017 report

73. The Co-Chair recalled that, at its thirty-ninth meeting, the Open-ended Working Group had considered the key messages of the Technology and Economic Assessment Panel in its 2017 report, one of which pertained to the availability of recovered, recycled or reclaimed halons in response to decision XXVI/7. According to the Halons Technical Options Committee, there was insufficient halon 1301 for civil aviation and the available stock might not last until the estimated run-out date of 2035. Following informal discussions, it had been agreed that the issue would be further discussed by the Twenty-Ninth Meeting of the Parties.

74. In the ensuing discussion, after the representative of the European Union had provided an update on the intersessional work undertaken, including on a draft decision, several representatives welcomed the efforts of the European Union and the Halons Technical Options Committee. One suggested that, in view of the likely exhaustion of halon banks, parties could be encouraged not to destroy any used halons and to instead promote trade in them.

75. The parties agreed that interested parties should meet in the margins of the meeting to discuss the draft decision under preparation by the European Union.

76. Subsequently, the representative of the European Union, speaking also on behalf of the United States, introduced a draft decision submitted by the two parties, set out in a conference room paper, which had been prepared after discussion with interested parties and the Halons Technical Options Committee, which had liaised with the International Civil Aviation Organization (ICAO). Were the decision to be adopted, the Technology and Economic Assessment Panel would be requested to continue to liaise with ICAO to gather information on the development and adoption of alternatives to the use of halons in civil aviation and to explore the possibility of forming a joint working group with ICAO to study the current and projected future quantities of halons installed, their associated emissions and any action that could be taken to reduce them, and the likely period before existing banks were exhausted. The Technology and Economic Assessment Panel would also be requested to submit a report on the work of the joint working group, if established, before the Thirtieth Meeting of the Parties and the fortieth session of the Assembly of ICAO for consideration and potential further action. In addition, parties would be invited, on a voluntary basis, to reassess their national import and export restrictions with a view to facilitating the import and export of recovered, recycled or reclaimed halons and the management of stocks of such halons. They would also be encouraged to refrain from destroying uncontaminated recovered, recycled or reclaimed halons before they had considered their national and the global long-term future needs for halons. He observed that quantities of used halons were being generated in particular from shipbreaking operations, which might prove useful in the future.

77. One representative observed that some countries, including his own, had stocks of used halon 1211, suggesting that a reference to the availability of the substance could be included in the draft decision.

78. Subsequently, the parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

F. Phase-out of hydrochlorofluorocarbons

79. The Co-Chair recalled that, at its thirty-ninth meeting, the Open-ended Working Group had heard a presentation by the Technology and Economic Assessment Panel prepared in response to

decision XXVIII/8, identifying possible needs for essential uses and servicing in refrigeration and air conditioning after 2020, as well as in the fire protection sector and particular niche solvent applications. She said that the Working Group had forwarded a draft decision on the matter for consideration by the Twenty-Ninth Meeting of the Parties (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. II, draft decision XXIX/[C]).

80. The parties agreed to refer further consideration of the matter to informal discussions between interested parties.

81. Subsequently, the representative of the United States, also on behalf of Australia, Canada and Japan, introduced a revised draft decision, set out in a conference room paper.

82. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

G. Energy efficiency (decision XXVIII/3)

1. Report by the Technology and Economic Assessment Panel on information submitted by parties on energy efficiency opportunities in the refrigeration and air-conditioning sector

83. The Co-Chair said that, by decision XXVIII/3, the parties had requested the Technology and Economic Assessment Panel to review energy efficiency opportunities in the refrigeration and air-conditioning and heat-pump sectors relating to a transition to climate-friendly alternatives, including not-in-kind options.

84. The co-chairs of the energy efficiency working group, Roberto Peixoto and Ashley Woodcock, gave a presentation on the Panel's report. A summary of the presentation prepared by the presenters is set out in section C of annex VI to the present report.

85. In the ensuing discussion, a number of representatives expressed appreciation for the Panel's work, especially given the time and resource constraints faced. Several said that the initial report was a useful framework for identifying core issues and as a starting point for addressing further, more specific, issues relating to energy efficiency, while taking account of the various areas of interest and priorities of parties.

86. A number of representatives, while acknowledging that the report had been developed in accordance with the mandate provided in decision XXVIII/3, said that the content was too general and that it lacked sufficient detail on practical alternatives, including for high-ambient-temperature applications. One said that the inclusion of policy, regulatory and information opportunities and financial and related incentives as broad areas within the report fell outside the purview of the Montreal Protocol; the focus should rather be on technical solutions and ensuring that new technologies were energy efficient, readily available, commercially viable and environmentally friendly, and also recognized safety concerns. A technical workshop dealing with such matters would be beneficial. Another said that parties operating under paragraph 1 of Article 5 needed specific information that enabled them to set goals, develop strategies and take decisions on matters relating to energy efficiency. A third representative said that, when assessing which alternative technological solutions to adopt, the most telling indicator was energy efficiency, which implied the development of forms of technology that were more efficient than those currently available. Such a focus would stimulate competition between manufacturers and promote innovation, widening technology choices.

87. Looking ahead, one representative said that further information was needed on how to maintain and enhance the energy efficiency of low-global-warming-potential alternatives, in line with paragraph 22 of decision XXVIII/2. It would be useful to complement the Panel's work, resources and capacity with additional expertise to support future work on the matter, which could be done through the creation of a Panel task force on energy efficiency, with the intention of tapping into the best available knowledge to inform the work of the parties, without creating an additional financial burden. Several other representatives expressed support for the proposal.

88. One representative said that further consideration should be given to the role of proper installation and maintenance to ensure that installed equipment continued to operate at or close to design efficiency, and further analysis should be undertaken of the co-benefits from energy efficiency, including the economic benefits to be reaped from reduced energy consumption. Another evoked the value to be gained in modifying the energy mix to give greater prominence to renewable sources. Another representative said that the principle of extended producer responsibility should also be taken into account when considering energy efficiency, and the importance of training be given greater attention. One representative said that it was crucial to maintain energy efficiency during the transition to alternative technologies.

89. One representative said that his country, along with various partners, had co-sponsored a workshop on air-conditioning technology, at which presentations had highlighted technological options that promoted energy efficiency. The matter of energy efficiency was complex and contained many elements that were often considered to be outside the scope of the Montreal Protocol, making it important for parties to discuss and attempt to reach agreement on the areas of focus and the types of interventions related to energy efficiency that could be considered under the Protocol, while not straying from its mandate or the parties' areas of expertise.

90. One representative, speaking on behalf of a group of countries, said that it would be useful to have additional information in a number of areas to help parties to assess their potential for energy efficiency, including components and their design; the planning and design of cooling systems; the potential benefits of alternative systems; and the reduction of leakage through improved maintenance. Other issues of relevance to energy efficiency that were worthy of further consideration included the role of external factors, such as climate conditions; the role of enabling policies, such as green procurement and energy service companies; and product labelling. Parties also needed to consider what data they needed to supply to enable the Panel to make more informed decisions in the future, and what contributions could be made by other organizations operating in the field.

91. The co-chairs of the energy efficiency working group responded to the issues raised during the discussion. Mr. Woodcock said that the working group had sought to remain within the spirit of decision XXVIII/3 during its deliberations. It was acknowledged that the report was a relatively safe first step in a new area, for both the parties and for the Panel. The Panel could undertake further work on more detailed scenarios, dependent upon the mandate given by the parties. On the matter of co-benefits, the relationship between energy efficiency and other benefits was not always straightforward, as in a case where increased demand for energy-efficient products reduced their price, further boosting demand and consequently increasing energy consumption. He agreed about the benefits to be gained from proper maintenance practices. In response to a question about extended producer responsibility, he said that, while producers needed to be held to account, they were generally keen to improve efficiency and to drive technological innovation.

92. Mr. Peixoto said that many projects were currently testing alternatives for high-ambient-temperature conditions with energy efficiency as a parameter, and the results of those tests were becoming available, adding to the store of knowledge on the matter. In response to a question about lower energy efficiency levels in parties operating under paragraph 1 of Article 5, he said that factors included the absence of specific regulations establishing minimum energy performance, and the cost of more efficient equipment.

93. The parties took note of the information provided.

2. Issues related to financial and technical support for energy efficiency in parties operating under paragraph 1 of Article 5

94. The Co-Chair recalled that, at its thirty-ninth meeting, the Open-ended Working Group had considered two draft decisions on the subject, which had been merged into a single draft decision and forwarded for consideration by the Twenty-Ninth Meeting of the Parties (UNEP/OzL.Conv.11/3-UNEP/OzL.Pro.29/3, sect. II, draft decision XXIX/[E]).

95. Many representatives, including one speaking on behalf of a group of countries, raised the issue of the role of the Montreal Protocol and the Multilateral Fund in enhancing energy efficiency, agreeing that, given the breadth and complexity of the topic, the discussion should be focused on energy efficiency within the context of HFC phase-down under the Kigali Amendment.

96. Most of those who spoke indicated interest in pursuing discussion of the draft decision in a contact group. There was general support for the energy efficiency workshop proposed in the draft decision, with two representatives calling for it to be held in conjunction with the fortieth meeting of the Open-ended Working Group, in July 2018. The workshop could provide the parties with more information on energy efficiency and serve as a basis for making decisions on how to handle energy efficiency under the Montreal Protocol. One representative, speaking on behalf of a group of countries, said that the workshop should address the mandate for the Technology and Economic Assessment Panel, and that energy efficiency should also be put on the agenda of the regional network meetings. Two others asked for discussion on the scope of the workshop; one of them cautioned against prejudging the approach that the parties might eventually wish to take.

97. Several representatives, while expressing support for discussions in a contact group, also raised concerns. One warned that the draft decision as it stood appeared to prejudge the parties' approach to energy efficiency: costing appeared to be proposed within the context of replenishment, even though no funding could be provided for energy efficiency because there were no associated

compliance obligations. Similarly, pointing out that the Executive Committee had previously determined that technological upgrades aimed at improving energy efficiency were not eligible for funding, another representative said that the parties must first decide whether to fund technological improvements aimed at enhancing energy efficiency and whether to invest time in discussing the cost guidelines. Other concerns expressed included the fact that energy efficiency was already on the agenda of the Executive Committee in accordance with decision XXVIII/2, meaning that bringing it to the Meeting of the Parties would create a parallel discussion, and that the draft decision went beyond the scope of decision XXVIII/2, possibly indicating differing interpretations of the guidance in that decision.

98. Several representatives, including one speaking on behalf of a group of countries, advised a measured approach to how energy efficiency could be dealt with under the Montreal Protocol. The discussion should be viewed as highly preliminary and begin with the gathering of information to ensure that the parties fully understood all the issues and were in a position to make informed decisions. In particular, it was important to have an overview of the other institutions working within the sphere of energy efficiency, such as the Global Environment Facility and the World Bank, including their activities, programmes and funding, together with the criteria and methodologies that they provided for energy efficiency measures. In that regard, one representative pointed out that equipment energy efficiency was an isolated element of the broader issue of overall buildings efficiency, which encompassed many factors that fell outside the purview of the Meeting of the Parties. Other proposed areas in which information could be gathered, whether through a workshop or the Technology and Economic Assessment Panel, were technology and practices; potential environmental benefits; potential costs and savings; financing modalities; potential synergies that could support enhanced energy efficiency, including by making the transition to sustainable alternatives; energy efficiency aspects of installation and maintenance; and the historical energy efficiency benefits achieved through the support of the Multilateral Fund.

99. Responding to some of the concerns raised during the discussion, the representative of India, speaking as a proponent of the draft decision, recalled that in paragraph 22 of decision XXVIII/2 the Executive Committee had been requested to develop cost guidance relating to energy efficiency. Addressing the lack of compliance obligations for energy efficiency, he noted that the issue was global-warming potential rather than ozone-depleting potential, urging the parties not to be reluctant to create a new system for measuring baseline as a means of making paragraph 22 of decision XXVIII/2 and decision XXVIII/3 operational. With regard to the incidental nature of energy efficiency gains achieved during the phase-out of ozone-depleting substances, he said that reports clearly showed that equipment efficiency had a major impact in terms of global-warming potential. Furthermore, equipment energy efficiency received a stand-alone rating in his country and need not be considered to be part of building energy efficiency.

100. The parties agreed to establish a contact group on energy efficiency to consider the draft decision, to be chaired by Patrick McInerney (Australia) and Leslie Smith (Grenada).

101. Subsequently, the representative of the Federated States of Micronesia, also on behalf of Morocco, introduced a draft decision on energy efficiency, set out in a conference room paper. The parties agreed to send that draft decision to the contact group on energy efficiency, on the understanding that it would be discussed separately from the draft decision forwarded by the Open-ended Working Group.

102. Subsequently, the co-chairs of the contact group introduced a draft decision, submitted by India, Bahrain, Kuwait, Lebanon, Saudi Arabia and the African Group, contained in a conference room paper, based on the draft decision originally forwarded by the Open-ended Working Group.

103. The parties agreed to forward the draft decision, as orally amended, for consideration and adoption during the high-level segment.

104. Subsequently, the co-chairs reported that the contact group had been unable to reach agreement on the draft decision submitted by the Federated States of Micronesia and Morocco. Several parties had stated, however, that it was important for the Technology and Economic Assessment Panel to include appropriate expertise on issues relating to energy efficiency. It was suggested that, as the parties considered the topic in more detail, gaps in their knowledge might appear, although the extent to which that was a matter of concern would become more evident after further discussion in 2018, including at the proposed workshop on energy efficiency.

105. The parties agreed that the issue should be returned to in the course of their discussions in 2018.

H. Safety standards relevant to low-global-warming-potential alternatives

106. The Co-Chair recalled that, at its thirty-ninth meeting, the Open-ended Working Group had discussed safety standards relevant to low-global-warming-potential alternatives on the basis of a workshop held immediately before the meeting and the report by the Technology and Economic Assessment Panel on safety standards that had been requested in decision XXVIII/4.

107. The representatives of China and the European Union introduced a draft decision, set out in a conference room paper, based on a number of the ideas raised at the workshop and at the meeting of the Open-ended Working Group. It was proposed therein that the Technology and Economic Assessment Panel, in consultation with the relevant task force, should provide a tabular overview of the safety standards relevant to the safe use of low-global-warming-potential alternatives in refrigeration, air-conditioning and heat-pump equipment, and liaise with standards organizations to keep the overview up to date. It was also proposed that parties should submit to the Secretariat information on their national safety standards relevant to the use of low-global-warming-potential flammable refrigerants, updating that information as necessary. All the aforementioned information should be made available by the Secretariat on its website.

108. Several representatives raised concerns with regard to ensuring that new safety standards should be at least as good as, and preferably better than, the standards that they replaced; liability and responsibility for the consequences if safety standards should prove inadequate; the increased safety risks in countries with high ambient temperatures; the lack of mention of specific aspects of safety, such as flammability, high-pressurization and toxicity; the narrow scope of the text in relation to the wealth of issues discussed at the workshop and by the Open-ended Working Group; the risk that giving the Panel a continuing task would lead to a cumulative drain on the Panel and that time-bound tasks were preferable; the utility of gathering information on national-level standard-setting; whether the Secretariat, rather than the Panel, should liaise with standards bodies, to accord with paragraph 7 of decision XXVIII/4 and also to enable the Panel to concentrate on its core mandate as an advisory body; and the importance of national capacity-building to make technicians aware and capable of adhering to relevant safety standards.

109. Several representatives, one speaking on behalf of a group of countries, recalled that it was not the responsibility of the Meeting of the Parties to set safety standards. The same representative speaking on behalf of a group of countries said that it was important for the bodies that had that role to be properly informed so that Montreal Protocol policies were reflected in their work. Another representative recalled that adherence to internationally set standards was voluntary, and a national concern, and that countries were entirely at liberty to make their standards even more stringent than those proposed.

110. The parties agreed to establish an informal group of interested parties to further discuss the matter of safety standards relevant to low-global-warming-potential alternatives, with a view to producing a revised draft decision.

111. Subsequently, the representative of the European Union, speaking also on behalf of China, introduced a revised draft decision, as set out in a conference room paper.

112. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

I. Consideration of hydrofluorocarbons not listed in Annex F to the Montreal Protocol

113. The Co-Chair recalled that, at its thirty-ninth meeting, the Open-ended Working Group had considered a draft decision by Norway and Switzerland that had been submitted to the Twenty-Eighth Meeting of the Parties, in 2016, but had been withdrawn owing to time constraints.

114. The representative of Switzerland, on behalf of the proponents, introduced the draft decision, set out in a conference room paper, which had been revised intersessionally. It was proposed therein that the assessment panels regularly provide information on the consumption and production of HFCs, and potentially other fluorinated substances, not listed in Annex F to the Montreal Protocol, that had global-warming potential in the range of those listed in Annex F.

115. One representative expressed concern that the proposal was a tacit attempt to reopen negotiations on the Kigali Amendment. Others disagreed, however, voicing support for the regular provision of reporting on the matter to the parties so that they might be informed.

116. Concern was expressed by several representatives that a number of the paragraphs prejudged policy matters or future action by parties. They proposed that the decision should be somewhat

simplified to pertain only to the provision of information on trends. Similarly, they said, some of the additional preambular text raised concerns.

117. Two representatives said that they were not in favour of extending the scope from HFCs to all fluorinated substances. They expressed support for the provision of the information through the quadrennial report of the Scientific Assessment Panel, whereas another representative, speaking on behalf of a group of countries, asked for the information to be updated as often as possible. Another representative warned of distracting the assessment panels from their task of supporting the parties in implementing the Kigali Amendment if they were requested to undertake work relating to substances other than those required for compliance purposes.

118. The representative of Switzerland explained that it was not the proponents' objective to reopen discussions on the content of the Kigali Amendment, but to be able to raise awareness among any industry taking up the substances in question of the lack of future sustainability of such substances.

119. The parties agreed to establish an informal group of interested parties to discuss the proposal further, with the representatives of Norway and Switzerland initially to hold informal discussions with interested parties in the margins of the meeting.

120. Subsequently, the representative of Switzerland, on behalf of the informal group of interested parties, introduced a revised draft decision, as set out in a conference room paper. Were the decision to be adopted, the assessment panels would be requested to provide in their quadrennial reports to be submitted to the Thirty-Fifth Meeting of the Parties, in 2023, and every four years thereafter, information on the consumption and production of HFCs not listed in Annex F to the Protocol that had global-warming-potential values no less than the lowest global-warming-potential value of the HFCs listed in Annex F.

121. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

J. Nomination and appointment of co-chairs and members of the Technology and Economic Assessment Panel and its technical options committees

122. The Co-Chair recalled that the Secretariat had thus far received five nominations: Sergey Kopylov, to continue to co-chair the Halons Technical Options Committee for four years; Marta Pizano, to continue to co-chair the Methyl Bromide Technical Options Committee for four years; Mohamed Besri, currently the Co-Chair of the Methyl Bromide Technical Options Committee, to serve as senior expert on the Technology and Economic Assessment Panel for two years; Marco González, to serve as senior expert on the Panel for two years; and Shiqiu Zhang, to serve as senior expert on the Panel for four years.

123. A number of representatives suggested that there was a need to further consider the future work and membership of the Refrigeration, Air-Conditioning and Heat Pumps Technical Options Committee, given the many activities that would be necessary around the phase-out of HCFCs and the new commitments under the Kigali Amendment.

124. Subsequently, the representative of the United States, after conducting consultations with interested parties, introduced a draft decision, as set out in a conference room paper. If the decision were to be adopted, the parties, in addition to appointing a number of co-chairs and members of the Technology and Economic Assessment Panel and its technical options committees, would encourage consultations on potential nominations of senior experts and suggest that reference be made to the matrix of expertise needed before making nominations for appointments of senior experts. The parties would also request the Secretariat to add to the agenda for the fortieth meeting of the Open-ended Working Group consideration of senior expert nominations from parties.

125. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

K. Consideration of the membership of Montreal Protocol bodies for 2018

126. The Co-Chair requested regional groups to submit nominations to the Secretariat for positions in various bodies under the Montreal Protocol for 2018, including the Implementation Committee, the Executive Committee of the Multilateral Fund and the co-chairs of the Open-ended Working Group.

127. Subsequently, the representative of the Secretariat reported that, upon the receipt of the names of the nominees, the relevant draft decisions had been included in the compilation of decisions for the parties' consideration and adoption during the high-level segment.

L. Compliance and reporting issues considered by the Implementation Committee

128. The Vice-President of the Implementation Committee, Leonard Marindany Kirui (Kenya), on behalf of the President, Brian Ruddie (United Kingdom), who was indisposed, presented a report on the outcomes of the fifty-eighth and fifty-ninth meetings of the Committee, including an overview of the draft decisions that the Committee had approved for consideration by the Twenty-Ninth Meeting of the Parties.

129. He observed that, in common with recent years, the agenda of both the Committee's meetings had been relatively light, which reflected the high level of compliance of parties with their obligations under the Montreal Protocol. For example, all parties had reported their production and consumption data for 2016 under Article 7 and only one situation of non-compliance needed to be brought to the attention of the parties, that of Kazakhstan, which had encountered difficulties in complying with its commitments under its existing plan of action. Kazakhstan had provided an explanation for the situation and submitted a revised plan of action, as set out in the second draft decision. The party was hopeful that it would receive support from the Global Environment Facility to build its capacity, which would bolster the implementation of its revised plan of action.

130. Three further draft decisions pertained to requests for changes in baseline data by Fiji, Pakistan and the Philippines. The Committee had considered the justifications provided by the parties for the requests, along with the supporting documentation submitted, and had concluded that each request had met the requirements of decision XV/19.

131. The final draft decision revisited the matter of cells left blank by parties in their Article 7 data reporting forms, which had been addressed initially in decision XXIV/14. There had been steady progress on the issue, with most parties complying with the decision by completing the cells with zeros rather than leaving them blank, but the Secretariat was nevertheless required to seek clarification from a number of parties every year, which caused delays in compiling information and assessing compliance. Parties were therefore urged, when submitting forms for reporting data in accordance with Article 7, to ensure that all cells were completed with a number, including zero, if appropriate, rather than leaving the cell blank.

132. The Committee had discussed the satisfactory progress made by the Democratic People's Republic of Korea, Libya and Ukraine in meeting their obligations under their existing plans of action. The Committee had also considered the situation of Israel, which had recently encountered difficulties in submitting the required information in a timely fashion. The party had expressed its commitment to ensuring that it would in the future comply fully with its reporting requirements under the Montreal Protocol in a timely manner.

133. In closing, he observed that the non-compliance procedure of the Montreal Protocol had set a unique and highly successful example among multilateral environmental agreements. He had every confidence that the solid foundation that it provided would continue to serve the needs of the parties in implementing the Kigali Amendment and phasing down HFCs.

134. The parties agreed to forward the draft decisions from the Implementation Committee for consideration and adoption during the high-level segment.

V. Vienna Convention issues

A. Report of the tenth meeting of the Ozone Research Managers of the Parties to the Vienna Convention

135. The Co-Chair recalled that the tenth meeting of the Ozone Research Managers of the Parties to the Vienna Convention had been held in Geneva in March 2017. The Managers, he said, met every three years, six months before the Conference of the Parties to the Vienna Convention, to discuss issues relating to ozone research and systematic observation and to develop recommendations for consideration by the Conference of the Parties. Those recommendations were included in document UNEP/OzL.Conv.11/5.

136. The Co-Chair of the tenth meeting of the Ozone Research Managers, Kenneth Jucks (United States), gave a presentation on the outcomes of that meeting. He first clarified that the purpose of the reports of the Managers was to address research and monitoring needs and to make specific recommendations regarding international action for improved research coordination and networking. After giving a summary of the main items discussed at the meeting, he said that the recommendations of the Managers had been formulated within a framework of four overarching goals: to improve the understanding and accuracy of future projections of global ozone data; to maintain and enhance existing observation capabilities for climate and ozone layer variables; to continue and enhance the funding available in the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention; and to build capacity to meet those goals.

137. On the matter of research needs, he said that the main priorities were to understand the complex coupling of ozone, atmospheric chemistry, transport and climate change and to improve understanding of the emissions and distribution of short-lived and long-lived ozone-depleting substances and greenhouse gases, including the uncertainties relating to carbon tetrachloride and methyl bromide emissions. Systematic observations were required to meet the research needs, including satellite observations of key trace gases in the stratosphere, although those had been compromised by the steady decrease in the number of measuring stations. Long-term monitoring was needed to clarify circulation and transport patterns, especially in data-poor regions. There was a need to continue the implementation of new and cost-effective instruments for ozone and trace gases and to further develop and apply data analysis protocols. Mechanisms should be set up to give appropriate recognition to data providers and to exchange findings and feedback on data quality. Other priority areas included data archiving and stewardship, and capacity-building, including the provision of training opportunities for local station operators in developing countries. Opportunities for building capacity and for increasing the impact of observational network programmes could be significantly enhanced by having greater resources available in the Trust Fund.

138. In the ensuing discussion, several representatives expressed appreciation for the work undertaken by the Ozone Research Managers. One, speaking on behalf of a group of countries, said that there was a clear link between ozone layer research and climate change research and enhancing those links would be of benefit to the continued implementation of both the Montreal Protocol and the Paris Agreement. Knowledge gaps still existed for a wide range of chemicals and their impact on the ozone layer, requiring continued measurement, long-term high-quality research and broad geographical coverage of monitoring activities. Funding had been provided through the European Union Horizon 2020 programme to support operations in that area, while the Sentinel-5 satellite had been launched in October 2017 as an atmospheric monitoring mission under the Copernicus Earth observation programme. Lastly, he stressed the importance of archiving data for long-term, open access and use. Another representative said that the research recommended by the Managers helped to make the connection between policy and science, aiding decision-making, and he highlighted the role of capacity-building in enabling countries to integrate scientific evidence into their policymaking processes.

139. In response, Mr. Jucks said that several websites contained relevant and useful data, but there was a lack of awareness of those data and how to apply them at the national level. The Ozone Research Managers aimed to improve the access and capabilities of parties that wished to use the data.

140. The representative of Australia introduced a draft decision, set out in a conference room paper, on the recommendations of the tenth meeting of the Ozone Research Managers, submitted by Australia, Bangladesh, Guatemala and Kazakhstan as members of the Bureau of the tenth meeting of the Conference of the Parties, along with Belarus, the Dominican Republic and Rwanda. She said that the Bureau had been well informed of the activities of the Managers, and the draft decision contained encouragement to the parties to adopt and implement, as appropriate, the recommendations of the Managers at their tenth meeting and to accord priority to research, capacity-building and communication activities.

141. The parties agreed that the matter should be further discussed informally by the interested parties.

142. Following those discussions, the parties agreed to forward the draft decision, as amended, for consideration and adoption during the high-level segment.

B. Status of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention

143. The Co-Chair recalled that, at its tenth meeting, the Conference of the Parties had established an advisory committee for the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention in an effort to improve its performance by ensuring that projects to be funded from the Trust Fund were of high quality. The Committee had also been requested to develop a short-term plan and a long-term strategy for the Trust Fund to enhance its effectiveness.

144. The Chair of the Advisory Committee, A. R. Ravishankara, presented a report on the work of the Committee. He said that the Trust Fund had been established in 2003 to support activities relating to research, capacity-building and systematic observations. The functions of the Committee were to revive the Trust Fund, align activities with the recommendations of the Ozone Research Managers, develop a long-term strategy and short-term action plan for the Trust Fund and align funding with the needs identified by the scientific community. The current priorities of the Committee were to review proposals from parties operating under paragraph 1 of Article 5 and parties with economies in transition and to make recommendations on funding; to evaluate the progress of funded projects; and to work with the Managers to identify knowledge gaps that could be addressed through the Trust Fund. He gave an outline of the activities undertaken to date and summarized the main components of the long-term strategy and short-term action plan. To fund the proposed activities it would be necessary to look beyond the voluntary contributions of parties and leverage additional sources of funding. Under the proposed rules for Trust Fund support, parties would be requested to submit only activities that pertained to recognized gaps, make in-kind contributions and show how funded activities would be sustained in the long term. Parties could assist by supporting extension of the life of the Trust Fund, contributing funding and resources, encouraging agencies within parties not operating under paragraph 1 of Article 5 to take part in activities and raising awareness among scientists and other relevant stakeholders of the work of the Trust Fund.

145. The representative of the Secretariat gave a presentation on the status of the Trust Fund, which had been established in 2003 pursuant to decision VI/2 of the Conference of the Parties. Among its functions, the Trust Fund provided complementary support for the continued maintenance and calibration of the existing ground-based stations, under the Global Atmosphere Watch programme of the World Meteorological Organization (WMO), that were monitoring column ozone, ozone profiles and ultraviolet radiation in developing countries and those with economies in transition. A memorandum of understanding on institutional arrangements had been signed by the United Nations Environment Programme (UNEP) and WMO in 2005. Projects and activities were implemented through WMO and since 2015 had been overseen by the Advisory Committee of the Trust Fund, pursuant to decision X/3 of the Conference of the Parties. Between 2003 and 30 September 2017, the Trust Fund had received total funds of $355,381 from contributing parties and in-kind contributions in conjunction with activities implemented under the Trust Fund. Activities funded to a total of $327,081 (completed, planned and in progress) included intercomparison or relocation of Dobson instruments, calibration of Brewer instruments and workshops and training courses. The limited resources notwithstanding, the activities implemented had contributed to building the capacity of countries and improving the quality of the global ozone network. Eight new project proposals had been submitted in 2016 and 2017; funding had been approved for two, while consultations on the remainder were continuing and were subject to availability of funding. In October 2017, Germany had offered €30,000 to WMO for activities relating to the Trust Fund. Parties should give consideration to the matter of the extension of the life of the Trust Fund, which was to expire in December 2019, and the long-term strategy and short-term plan of action for the Trust Fund prepared by its Advisory Committee, as outlined in document UNEP/OzL.Conv.11/6.

146. The representative of WMO gave a presentation on recent activities and near-future plans in relation to the Trust Fund. Capacity-building had been undertaken to ensure data quality throughout the global network, including instrument calibration campaigns, data analysis workshops and assistance for research and systematic observations. Activities since 2014 had included the relocation of Dobson instruments, Dobson intercomparison exercises in Japan (for Asia), Australia (for the south-west Pacific region) and Spain (for North Africa), capacity-building on data management and instrument calibration in Kenya, and other training activities. Overall, during the period 2015–2017, 10 instruments had been calibrated and 34 participants from developing countries had received training; however, much greater success could have been achieved with greater replenishment of the Trust Fund.

147. In the ensuing discussion, a number of representatives stressed the important role played by the Trust Fund in financing research-related activities, its relatively limited resources notwithstanding.

One said that the establishment of the Advisory Committee had helped to ensure quality of performance and value for money and would assist in mobilizing funding.

148. The representative of Australia introduced a draft decision on the Trust Fund, set out in a conference room paper, submitted by Australia, Bangladesh, Guatemala and Kazakhstan as members of the Bureau of the tenth meeting of the Conference of the Parties, along with Belarus, the Dominican Republic and Rwanda. The main points of the draft decision were a request to the Executive Director of UNEP to extend the life of the Trust Fund until 31 December 2026; a request for the Advisory Committee to implement the long-term strategy and short-term plan of the Trust Fund; and a request for parties and relevant international organizations to make financial or in-kind contributions to support activities under the Trust Fund.

149. Several representatives welcomed the draft decision, stressing the importance of the activities being carried out with the support of the Trust Fund. The parties agreed that the matter should be further discussed informally by the interested parties.

150. Subsequently, the representative of Australia introduced a revised draft decision, set out in a conference room paper, which included a new paragraph by which the Conference of the Parties would request the Advisory Committee to develop a strategic plan for mobilizing public and financial resources and in-kind contributions for the Trust Fund, to safeguard necessary research and observation activities, and to submit it to the Conference of the Parties at its twelfth meeting.

151. The representative of Norway said that his Government was pledging an additional sum to the Trust Fund to support the development of the knowledge base that was so vital to the successful implementation of the Vienna Convention and the Montreal Protocol, especially with regard to the links between ozone depletion and climate change. Expressing his concern at the limited resources available in the Trust Fund, he encouraged other donors to follow his country's example.

152. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

VI. Other matters

A. Linkages between hydrochlorofluorocarbons and hydrofluorocarbons

153. As agreed at the time of the adoption of the agenda, the representative of Saudi Arabia introduced the subject of linkages between hydrochlorofluorocarbons and hydrofluorocarbons, with particular reference to paragraphs 6–8 of decision XXVIII/2. He explained that his concern was to avoid the need for industry to carry out a double transition, from HCFCs to high-global-warming-potential HFCs and subsequently to low-global-warming-potential alternatives. Many parties operating under paragraph 1 of Article 5 had begun to phase out HCFCs on the understanding that HFCs would be an acceptable alternative, but, following the adoption of the Kigali Amendment, they faced the substantial costs of converting from HFCs and those of converting from HCFCs.

154. In paragraph 6 of decision XXVIII/2, the parties had recognized a need for flexibility if no other technically proven and economically viable alternatives were available. A mechanism to put that principle into effect was needed. While he did not have firm proposals to put forward and was not expecting a decision to be taken at the current stage, he wished to signal the importance of the issue to parties operating under paragraph 1 of Article 5 and to encourage a constructive discussion on the topic.

155. Other representatives expressed agreement with the position of Saudi Arabia. One pointed out that his country's HCFC phase-out management plan had been drawn up in 2011 on the assumption that HFC alternatives would be readily available. In some cases HFCs remained the only alternatives available, for example in household air conditioning in countries with high ambient temperatures, where R-410A, a blend of very high global-warming-potential HFCs, was the only alternative to HCFC-22. The costs of installing R-410A in thousands of households and subsequently replacing it again some 10 to 15 years later would be prohibitive. Air conditioning was a requirement, not a luxury, in his country and many others that faced summer temperatures in excess of 50°C, and it was unclear how their Governments should be planning for the years ahead. Representatives called for all parties' understanding and guidance in helping parties operating under paragraph 1 of Article 5 to plan strategically.

156. One representative highlighted the challenges faced in replacing HCFCs in refrigeration technology used by fishing fleets, which was a problem common to many developing countries, including small island developing States. Another drew attention to the needs of low-volume-

consuming countries, which relied entirely on imports of equipment and refrigerants and faced challenges in ensuring the provision of suitable training for technicians and capacity-building.

157. Other representatives acknowledged the concerns of parties operating under paragraph 1 of Article 5, in particular those with high-ambient-temperature climates, and the need to avoid double conversions, which would be both financially and environmentally harmful. They were confident that flexible and progressive solutions could be found in the framework of the Montreal Protocol, just as in the past. They expressed their willingness to include the item on the agenda of meetings under the Montreal Protocol in 2018 and, in the meantime, to work with interested parties to develop a way forward.

158. A number of representatives drew attention to the provisions of decision XXVIII/2, in which the parties had envisaged the possibility of deferring consideration of the HCFC compliance status of any party operating under a high-ambient-temperature exemption for 2025 and 2026 (with the possibility of extensions) where it had exceeded its allowable consumption levels owing to HCFC-22 consumption for specified uses in air conditioning. That, they said, would avoid the need to replace HCFC-22 with R-410A. For sectors other than air conditioning, the parties could seek guidance from the Technology and Economic Assessment Panel. They also pointed out that it had never been the aim under the Montreal Protocol to prescribe the use of particular technology; that was up to individual parties.

159. One representative recalled in particular that paragraphs 6–8 of decision XXVIII/2 had been included after discussions initiated by Saudi Arabia; they provided a framework that would be helpful in guiding future discussions; and their provisions were not limited to high-ambient-temperature countries. He would be willing to engage in discussions to clarify what further information parties needed, including, for example, information on industry trends in developing appropriate technologies. He also recalled that the date on which parties operating under high-ambient-temperature conditions could have consideration of their HCFC compliance status deferred had originally been proposed as 2020; it had been postponed to 2025 and 2026 at the suggestion of countries operating under high-ambient-temperature conditions.

160. Responding to those comments, the representative of Saudi Arabia expressed thanks to the parties for their willingness to display flexibility. He explained that his concerns were relevant to all parties operating under paragraph 1 of Article 5, not only those operating under high-ambient-temperature conditions, but that the latter group were facing particularly difficult challenges. He said that he recognized that the provisions of decision XXVIII/2 meant that such parties could wait longer for the transition, but was nonetheless concerned that there appeared to be no available low-global-warming-potential alternatives to several uses of HCFCs and the industries producing such alternatives were based abroad. He clarified that he was not expecting to be told which specific alternatives to use, but rather was seeking general guidance on the way forward.

161. The Co-Chair acknowledged parties' concerns around the availability of suitable technology and substances to carry out the transition, in particular to avoid double conversions, the role of the Montreal Protocol in providing information rather than prescribing the use of particular technology and the need to develop a mechanism to make the provisions of paragraphs 6–8 of decision XXVIII/2 operational.

162. The parties agreed to include the item on the agenda of the fortieth meeting of the Open-ended Working Group.

B. Impact of hurricanes on the ability of Caribbean States to meet their obligations under the Montreal Protocol

163. As agreed at the time of the adoption of the agenda, the representative of Grenada introduced the subject of the impact of recent hurricanes on the ability of several Caribbean States to meet their obligations under the Montreal Protocol. He explained that 2017 had seen an unusually large number of category 5 hurricanes affect the Caribbean, with loss of life and severe damage to the infrastructure and the local economy. Antigua and Barbuda, the Bahamas, Cuba, Dominica and the Dominican Republic had been particularly badly affected. He acknowledged with appreciation the decision of the Executive Committee of the Multilateral Fund to provide additional assistance to Dominica and appealed to all the institutions under the Montreal Protocol to consider the impact of the hurricanes on the ability of the affected parties to meet their commitments.

164. Expressing their sympathy with the plight of the countries affected by the hurricanes, representatives highlighted other impacts of climate change and natural disasters, including the effects

of higher rainfall leading to extensive flooding, thereby severely affecting food production. Another pointed to the impact of earthquakes and tsunamis.

165. One representative, while expressing his sympathy for those problems, queried whether the Montreal Protocol was the appropriate forum in which to discuss such issues. As he had said during discussions on the Kigali Amendment, he did not wish to see the Protocol evolve into an alternative or parallel climate treaty or extend even wider to encompass other environmental issues such as deforestation, desertification or loss of biodiversity.

166. Subsequently, the representative of Grenada introduced a draft decision, set out in a conference room paper, by which the parties would encourage all parties to assist Antigua and Barbuda, the Bahamas, Cuba, Dominica and the Dominican Republic by controlling the export of ozone-depleting substances, and technologies dependent on them, to those countries, to avoid increasing their dependence on such substances, which could lead to a state of non-compliance; request the Executive Committee of the Multilateral Fund, the implementing agencies and the Implementation Committee to consider the impacts of the hurricanes on those countries in their decisions and activities; and request the relevant parties to provide an update on the situation at the Thirtieth Meeting of the Parties.

167. Several representatives expressed their sympathy for the affected parties and their support in principle for the draft decision, recognizing that the parties had adopted a similar decision with regard to Haiti after the earthquake in 2010. One representative called for a fact-finding mission to the region.

168. Subsequently, the representative of Grenada introduced a revised draft decision, set out in a conference room paper.

169. The parties agreed to forward the draft decision for consideration and adoption during the high-level segment.

Part two: high-level segment (23 and 24 November 2017)

I. Opening of the high-level segment

170. The high-level segment was opened at 10.10 a.m. on Thursday, 23 November 2017, by the President of the Bureau of the tenth meeting of the Conference of the Parties to the Vienna Convention and Minister of Environment and Natural Resources of Guatemala, Sydney Alexander Samuels Milson.

171. Opening statements were delivered by Mr. Milson; the President of the Bureau of the Twenty-Eighth Meeting of the Parties to the Montreal Protocol and Minister of Environment of Rwanda, Vincent Biruta; the Executive Director of UNEP, Erik Solheim; and the Minister of Environment and Climate Change of Canada, Catherine McKenna.

172. In his statement, Mr. Milson welcomed the positive developments in the implementation of the Vienna Convention since the previous meeting of the Conference of the Parties, but stressed that future scientific monitoring and research activities were threatened by the parlous financial situation of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention. He called for the Conference of the Parties to make a renewed commitment to financing the Trust Fund in order to have sufficient data to move forward in improving knowledge of climate uncertainties and to be able to combat the significant challenges of climate change, ozone depletion and pollution. There was a compelling need to identify and stop those human activities that were endangering the environment before it was too late, he said, urging the Conference of the Parties to take any measure and decision necessary to provide the ozone layer with the protection that it needed.

173. Mr. Biruta, in his statement, noted that the city of Montreal had become synonymous with the protection of the ozone layer, thanks to the sterling work of the Government of Canada over the years, from the Vienna Convention for the Protection of the Ozone Layer to the Conference of the Plenipotentiaries on the Protocol on Chlorofluorocarbons, which adopted the Montreal Protocol in 1987, to the present day. The Protocol was a significant success story, having saved millions of people from the deleterious effects of ozone depletion, and, with the adoption and subsequent ratification of the Kigali Amendment by 22 parties, more success was to come when the Amendment entered into force in 2019. Those parties that had not yet ratified the Amendment should do so forthwith. Looking to the agenda of the current meeting, he noted that without sufficient financial support it would be almost impossible for parties operating under paragraph 1 of Article 5 to sustain their efforts to phase out ozone-depleting substances and to begin work to phase down hydrofluorocarbons, in line with the

Amendment. It was therefore critical that the Multilateral Fund be adequately replenished. The strong link between energy efficiency and the Amendment should also be emphasized, as work to ensure energy efficiency could see a doubling of the climate benefits from the Amendment.

174. In his statement, the Executive Director of UNEP stressed that the world needed to come together to take action to solve the scourges facing humanity, just as it had in 1987 with the adoption of the Montreal Protocol, which had become the most successful international treaty of all time and thanks to which the hole in the ozone layer was shrinking and was on track to have closed by 2050. There were, he said, four key aspects that, knitted together, would lead to successful outcomes: science, citizenry, good political leadership and business. Good scientific knowledge was the cornerstone of all action, meaning that it was critical to counter the nascent anti-science movement that was beginning to gain ground in some parts of the world. The dangerous denial of basic scientific truths could lead to the spread of disease and death. Equally, without citizen mobilization for good causes, there would be little will to act on the part of politicians and business. Turning to the political aspect, he lauded current and previous politicians, including those not seen as environmentalists, who had shown brave leadership by taking difficult decisions. Lastly, on the role of business, he praised the innovative spirit of those businesses that had enabled the full and successful implementation of the Protocol, looking forward to a move to cleaner cooling of the planet through the implementation of the Kigali Amendment. Those four indivisible aspects would, he stressed, enable the international community to lift all citizens out of extreme poverty, provide education for all, protect wildlife and put an end to climate change.

175. Ms. McKenna, in her statement, welcomed the momentous accomplishments of the Montreal Protocol and the 22 ratifications of the Kigali Amendment, noting that between 1987 and 2010 the Protocol had led to the elimination of more than 135 billion tonnes of carbon dioxide equivalent and the phase-out of close to 100 ozone-depleting substances, and the ozone layer was healing. Politicians of different political persuasions, scientists and many others across the globe had come together to attain a lofty goal and had proved sceptics wrong. That success and that leadership must come to the fore again in the face of climate change, which was having devastating effects, she said, citing the example of Inuit communities in the high Arctic facing not only the loss of caribou herds, which had great cultural importance as well as being a source of food, but also the loss of life, as the ice that had borne the weight of hunters who, for many generations, had lived in those areas became too thin to do so. It behoved the international community, for the sake of future generations, to show the same leadership as in 1987, to listen to science, to cooperate with industry and to foster innovation, working together as one. Difficult decisions would have to be taken, but had been taken before and could be taken again.

176. Following those opening remarks, the parties watched a North American First Nation hoop dance, a traditional dance in which the hoops represent the human connection to the land, trees, water, nature, animals and birds, celebrating life and the natural world.

II. Organizational matters

A. Election of officers of the eleventh meeting of the Conference of the Parties to the Vienna Convention

177. At the opening session of the high-level segment of the meeting, in accordance with paragraph 1 of rule 21 of the rules of procedure, the following officers were elected, by acclamation, to the Bureau of the eleventh meeting of the Conference of the Parties to the Vienna Convention:

President:	Marc D'Iorio (Canada) (Western European and other States)
Vice-Presidents:	Ezzat Lewis H. Agaiby (Egypt) (African States)
	Abdullah Al Islam Jakob (Bangladesh) (Asia-Pacific States)
	Liana Ghahramanyan (Armenia) (Eastern European States)
Rapporteur:	Ulises Lovera (Paraguay) (Latin American and Caribbean States)

B. Election of officers of the Twenty-Ninth Meeting of the Parties to the Montreal Protocol

178. At the opening session of the high-level segment of the meeting, in accordance with paragraph 1 of rule 21 of the rules of procedure, the following officers were elected, by acclamation, to the Bureau of the Twenty-Ninth Meeting of the Parties to the Montreal Protocol:

President:	Yaqoub al-Matouq (Kuwait) (Asia-Pacific States)
Vice-Presidents:	Azra Rogovic-Grubic (Bosnia and Herzegovina) (Eastern European States)
	Patricia Soares Leite (Brazil) (Latin American and Caribbean States)
	Larke Williams (United States of America) (Western European and other States)
Rapporteur:	Samuel Paré (Burkina Faso) (African States)

C. Adoption of the agenda of the high-level segment of the eleventh meeting of the Conference of the Parties to the Vienna Convention and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol

179. The following agenda for the high-level segment was adopted on the basis of the provisional agenda contained in document UNEP/OzL.Conv.11/1-UNEP/OzL.Pro.29/1:

1. Opening of the high-level segment.
2. Organizational matters:
   (a) Election of officers of the eleventh meeting of the Conference of the Parties to the Vienna Convention;
   (b) Election of officers of the Twenty-Ninth Meeting of the Parties to the Montreal Protocol;
   (c) Adoption of the agenda of the high-level segment of the eleventh meeting of the Conference of the Parties to the Vienna Convention and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol;
   (d) Organization of work;
   (e) Credentials of representatives.
3. Presentations by the assessment panels on the status of their work, including latest developments.
4. Presentation by the Chair of the Executive Committee of the Multilateral Fund on the work of the Executive Committee.
5. Statements by heads of delegation and discussion on key topics including:
   (a) Identifying future opportunities and priorities (high-level round table);
   (b) Science of ozone layer depletion and recovery: reflections on the past, present and future (science event).
6. Report of the co-chairs of the preparatory segment and consideration of the decisions recommended for adoption by the Conference of the Parties to the Vienna Convention at its eleventh meeting and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol.
7. Dates and venues for the twelfth meeting of the Conference of the Parties to the Vienna Convention and the Thirtieth Meeting of the Parties to the Montreal Protocol.
8. Other matters.
9. Adoption of decisions by the Conference of the Parties to the Vienna Convention at its eleventh meeting.
10. Adoption of decisions by the Twenty-Ninth Meeting of the Parties to the Montreal Protocol.
11. Adoption of the report of the eleventh meeting of the Conference of the Parties to the Vienna Convention and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol.
12. Closure of the meeting.

D. Organization of work

180. The parties agreed to follow their customary procedures.

E. Credentials of representatives

181. The Bureaux approved the credentials of the representatives of 102 of the 147 parties represented at the meeting. The Bureaux provisionally approved the participation of 45 parties on the understanding that they would forward their credentials to the Secretariat as soon as possible. The Bureaux urged all parties attending future meetings to make their best efforts to submit credentials to the Secretariat as required under rule 18 of the rules of procedure. The Bureaux also recalled that the rules of procedure required that credentials be issued either by a head of State or Government or by a minister for foreign affairs or, in the case of a regional economic integration organization, by the competent authority of that organization. The Bureaux recalled that representatives of parties not presenting credentials in the correct form could be precluded from full participation in the meetings, including with regard to the right to vote.

III. Presentations by the assessment panels on the status of their work, including latest developments

182. The Co-Chair of the Scientific Assessment Panel, John Pyle (United Kingdom), gave a presentation on the work of the Panel. A summary of the presentation, prepared by the presenter, is set out in section D.1 of annex VI to the present report.

183. The Co-Chairs of the Environmental Effects Assessment Panel, Janet F. Bornman (Australia) and Nigel Paul (United Kingdom), gave a presentation on the work of the Panel. A summary of the presentation, prepared by the presenters, is set out in section D.2 of annex VI to the present report.

184. The Co-Chairs of the Technology and Economic Assessment Panel, Marta Pizano (Colombia) and Bella Maranion (United States) gave a presentation on the work of the Panel. A summary of the presentation, prepared by the presenters, is set out in section D.3 of annex VI to the present report.

185. The parties took note of the information presented.

IV. Presentation by the Chair of the Executive Committee of the Multilateral Fund on the work of the Executive Committee

186. The Chair of the Executive Committee of the Multilateral Fund, Paul Krajnik (Austria), reported on progress in the implementation of the Committee's decisions since the Twenty-Eighth Meeting of the Parties, summarizing the information provided in document UNEP/OzL.Pro.29/6.

187. He said that the Committee had continued to monitor the implementation of HCFC phase-out management plans and one HCFC production phase-out management plan. The number of countries with an approved HCFC phase-out management plan stood at 144, of which 30 already had stage II approved. Only one country did not have such a plan approved. Full implementation of the HCFC phase-out management plans approved to date would address about 60 per cent of the total baseline consumption of parties operating under paragraph 1 of Article 5. In approving such plans, the Committee had continued, to the extent possible, to give priority to the introduction of technology with low global-warming potential.

188. The Executive Committee had addressed matters relating to the Kigali Amendment. It had accepted, with appreciation, the additional contributions to the Multilateral Fund announced by a number of parties not operating under paragraph 1 of Article 5 to permit the provision of fast-start support for implementation of the Amendment. By 14 November 2017, more than $14 million of the funds pledged had been received. The Committee had approved guidelines for the approval of requests for enabling activities to help countries to begin their reporting and regulatory activities and had decided to prioritize the use of the additional contributions for such requests. It had approved such funding for 59 countries.

189. To learn more about the incremental capital costs associated with the phase-down of HFCs, the Executive Committee had approved a first HFC investment project in a domestic refrigeration manufacturing facility in Bangladesh. Funding for that project, and for the preparation of eight additional investment projects to eliminate HFCs, came also from the additional contributions.

190. In response to decision XXVI/9, the Executive Committee had commissioned surveys of alternatives to ozone-depleting substances in 127 countries. With regard to HFCs and HFC blends, the results of the 119 surveys received to date had shown an overall annual growth rate of about 22 per cent for the period 2012–2015, mainly in the refrigeration and air-conditioning sector. Bilateral

and implementing agencies had been requested to use the findings when undertaking enabling activities.

191. The Executive Committee had agreed to submit to the Thirtieth Meeting of the Parties cost guidelines for funding the phase-down of HFC consumption and production and to finalize the guidelines as soon as possible thereafter. The draft guideline template currently included the principles agreed upon in decision XXVIII/2, including flexibility in implementation, the cut-off date for eligible capacity, second and third conversions, sustained aggregate reductions in HFC consumption and production, categories eligible for incremental costs and eligibility of Annex F substances subject to high-ambient-temperature exemptions.

192. On the matter of HFC-23 by-product control obligations, the Executive Committee had agreed to consider possible cost-effective options for compensation for HCFC-22 swing plants. It had commissioned an independent evaluation of cost-effective and environmentally sustainable options for HFC-23 destruction from HCFC-22 production facilities and invited implementing agencies to submit proposals for the demonstration of HFC-23 by-product mitigation or conversion technologies. Funding had already been approved for the preparation of one such project.

193. He then spoke of the main achievements of the implementing agencies of the Multilateral Fund. In 2017, the United Nations Development Programme had continued to assist 47 countries with implementation of their HCFC phase-out management plans. It had also helped parties to undertake demonstrations of climate friendly and energy-efficient alternative technologies, feasibility studies on district cooling and surveys of alternatives to ozone-depleting substances. It had supported 10 countries in their requests for funding for enabling activities and 3 countries in developing stand-alone investment projects to phase down HFCs by replacing them with technologies with a lower global-warming potential.

194. UNEP was assisting 102 countries with the implementation of HCFC phase-out management plans and 104 countries with institutional strengthening, and had helped 79 countries to undertake their surveys of alternatives to ozone-depleting substances. The Compliance Assistance Programme assisted all parties operating under paragraph 1 of Article 5, including through capacity-building support for standard setting, certification, safe refrigerant management, and licensing and quota systems. Furthermore, in 2017, UNEP, with partners, had organized the first international conference on the management of ozone-depleting substances in the fishing sector.

195. The United Nations Industrial Development Organization (UNIDO) was assisting 74 countries with the implementation of HCFC phase-out management plans; seven projects to demonstrate alternatives with low global-warming potential and two feasibility studies on district cooling were also well under way. It had also helped countries to undertake 27 national surveys of alternatives to ozone-depleting substances and two destruction projects. In relation to the Kigali Amendment, UNIDO had organized a third donor meeting, which had included consideration of the latest challenges, and hosted dialogue among 55 countries at an expert group meeting to discuss ratification. UNIDO would also support enabling activities in 17 countries.

196. The approved HCFC phase-out management plans supported by the World Bank would see the elimination of 5,700 ODP-tonnes of consumption, equivalent to 31.8 million tonnes of carbon dioxide emissions on an annual basis. By the end of 2016, projects implemented by World Bank had resulted in the reduction of 330,000 ODP-tonnes of consumption and production, on the basis of more than $1 billion in grants. In relation to the Kigali Amendment, the World Bank would be supporting enabling activities for several countries, along with project preparation for an HFC investment project in the commercial refrigeration sector.

197. In conclusion, he expressed thanks to those representatives who had served on the Executive Committee in 2016 and 2017, the secretariat of the Multilateral Fund and the bilateral and implementing agencies for their devotion, work and commitment.

198. The parties took note of the information presented.

V. Statements by heads of delegation and discussion on key topics

199. Under item 5 of the agenda of the high-level segment, the parties engaged in a 90-minute round table discussion and a 90-minute science event, in addition to hearing statements from heads of delegation.

A. Identifying future opportunities and priorities

200. The round-table discussion, on the theme "Identifying future opportunities and priorities", was held on the morning of 23 November 2017. A winner of the Champion of the Earth environmental honour bestowed by the United Nations, Leyla Acaroglu, as moderator, posed questions to nine panellists and the participants and then took questions for the panellists from the floor. The panellists were Ms. McKenna; the Deputy Minister of Nature Protection of Armenia, Khachik Hakobyan; the Deputy Minister of Environment of the Dominican Republic, Zoila González de Gutiérrez; the Deputy Minister of Environment of Estonia, Meelis Münt; Mr. Milson, in his capacity as Minister of Environment and Natural Resources of Guatemala; the Secretary in the Ministry of Environment, Forests and Climate Change of India, C. K. Mishra; the Minister of State in the Ministry of Environment and Energy of Maldives, Abdulla Ziyad; Mr. Biruta, in his capacity as Minister of Environment of Rwanda; and the Executive Director of UNEP.

1. Key factors in the success of the Montreal Protocol

201. Responding to a question about what the panellists considered to be the main reasons for the success of the Montreal Protocol, one panellist spoke of the instrument's universal ratification. Only by acting together was it possible to make a difference. He, along with two other panellists, also highlighted the importance of developing a sound legal and normative framework, while pointing out that that was worthless without proper implementation and enforcement. Two panellists cited the political leadership and will shown over the years as major factors. One explained how her country had been instrumental in convincing more sceptical Governments of the importance of acting and in encouraging developed countries to support developing countries. The other panellist spoke of the presidential decrees issued in her country that had paved the way for further progress, especially in the licensing of technicians.

202. Strong partnerships with key institutions and agencies involved in enforcement was crucial for successful implementation, said one panellist, suggesting that the experience gained by relevant bodies in his country when dealing with chlorofluorocarbons would stand them in good stead when they dealt with HCFCs and HFCs. Another panellist said that she was proud of the institutional strengthening and capacity-building achieved in her country, which would ensure that phase-out was sustainable.

203. One panellist linked the success of the Montreal Protocol to countries being able to win over relevant industries and ensure their understanding of and participation in efforts to meet compliance obligations. Another highlighted the fact that the Protocol and the Kigali Amendment in effect created opportunities for industry, including in terms of innovation.

204. Speaking from the floor, one representative said that he considered the Kigali Amendment to be a well-balanced instrument that addressed the concerns of all parties, leaving none behind. That was likely to be a factor in the rapid uptake of the instrument.

2. Catalysts that had enabled progress to be made

205. Talking of the catalysts for progress, two panellists spoke of how the clarity of the common goal and the solid framework, which specified what was required from whom and by when, had facilitated the task. That had enabled the markets to follow and had given rise to innovation.

206. Several panellists underscored the need for dialogue and cooperation between Governments and industry, with one highlighting a need to link the global goal with national concerns in order for efforts to achieve it to bear fruit. Another among them stressed the importance of ensuring understanding of the Montreal Protocol among all relevant ministries. Another panellist recalled the importance of political will.

207. One panellist praised the quality of the technical and scientific reporting provided by UNEP, which provided sound arguments for action, and stressed the value of the Multilateral Fund as the key financial mechanism for ensuring that countries had the means to act.

3. Key learning from campaigns and communication

208. Several panellists said that the public messaging on important environmental issues must be clear, comprehensible and not couched in jargon. It was a question of capturing public imagination, galvanizing people into action and harnessing the power of the public to spur politicians on. It was also important to speak not only of the problems, but also of positive elements and opportunities, such as the creation of jobs and economic growth stemming from the use of green technology and power.

209. A number of panellists stressed the need to reach young people with adapted messaging, with two of them outlining the environmental education programmes conducted in their own countries.

210. One representative, speaking from the floor, recalled his country's driving role in and commitment to combating climate change, stating that the admirable success of the Montreal Protocol should serve as inspiration in the imperative fight against other pressing environmental issues, including plastic pollution.

4. Role of young people

211. Responding to a question from the floor about whether there was a role for children and young people in tackling major environmental challenges, one panellist said that, although young people were constantly referred to as "the leaders of tomorrow", they were already engaged and active, many more so than adults. Young people should continue to raise awareness of important environmental issues among their family members and adult friends. Another panellist urged children to continue to hold adults accountable.

5. Encouraging ratification of the Kigali Amendment

212. Turning to the future, panellists were asked how they would encourage parties that had yet to ratify the Kigali Amendment to do so. Almost all those who responded stressed that global support was essential for the effectiveness of the Amendment. Universal ratification would send a strong signal to the market, driving innovation and leading to more affordable alternatives for HFCs. It would also send a signal to other sectors in which carbon dioxide reductions were needed, notably aviation and the maritime sector. It was important to convey the message that the Amendment was different from the Montreal Protocol, bringing an entirely new family of substances into the scope of the Protocol and taking on a larger issue. It also had a clear energy efficiency aspect. Overall, there was a strong business case to be made for ratification, including the fact that ratification was a condition for gaining access to fast-track funding from the Kigali Cooling Efficiency Programme. Cooling was important for public health and welfare, the economy and the environment, and the next step would be to launch a global coalition for clean cooling.

6. Adequate financial support

213. Noting that the Vienna Convention had provided the framework for the science behind the Montreal Protocol, including regular meetings of the Ozone Research Managers, the moderator asked about how to ensure adequate financial support for research in a climate of financial restraint. The responding panellists called for sufficient funding for science, observing, among other things, that the cost of inaction was much higher than that of action. Science was key to action under any agreement. In addition to funding their own work, developed countries needed to provide funding for scientific research projects and workshops in developing countries, both in connection with alternatives to HFCs and to monitor progress. Representatives should engage with their ministers of finance and ensure that the needs were well understood.

7. International cooperation

214. With regard to the successful experiences of the Montreal Protocol that could be applied to new international cooperation aimed at tackling other global challenges, such as pollution and biodiversity loss, the panellists attributed the success of cooperation under the Protocol to political leadership; strong institutions, including a scientific panel that was beyond political control, the carefully designed Multilateral Fund, the Secretariat and the Paris-based support structure for ozone officers; the recognition of countries' unique situations, reflected in the principle of common but differentiated responsibilities; a strong scientific foundation; clear targets; universal ratification; and the breadth of actors involved in implementation, including Governments, the private sector, civil society and academic institutions. Engaging with the major chemicals producers on corporate social responsibility was also proposed as an avenue for combating global environmental challenges.

8. Link to the Sustainable Development Goals

215. As the Sustainable Development Goals essentially dealt with people and the planet, said one panellist, any policies of benefit to both would contribute to their achievement. Examples were given of policies aimed at combating pollution or creating green jobs, in addition to the recently announced Powering Past Coal Alliance.

B. Science of ozone layer depletion and recovery: reflections on the past, present and future

216. The science event, on the theme "Science of ozone layer depletion and recovery: reflections on the past, present and future", was held on the afternoon of 23 November 2017. Moderated by the Chief Science Adviser of the Government of Canada, Mona Nemer, it featured a series of presentations by the panellists, followed by a question-and-answer session. The panellists, listed in the order in which

they spoke, were Vitali Fioletov (Environment and Climate Change Canada), Nathan Gillett (Environment and Climate Change Canada), Amanda Maycock (University of Leeds, United Kingdom), Guus Velders (Utrecht University and National Institute for Public Health and the Environment, Netherlands) and Anne Thompson (Goddard Space Flight Centre, National Aeronautics and Space Administration, United States).

217. Mr. Fioletov gave a presentation on previous and current changes in atmospheric composition and the ozone layer. A marked fall in concentrations of stratospheric ozone had been observed between 1979 and 1996; that had been largest near the poles, although it had also been subject to a large year-to-year variability, influenced by solar cycle variations and variations in tropical stratospheric winds and volcanic aerosols. The concentration of ozone-depleting substances had shown an increase until the late 1990s and a reduction thereafter. Since 1997, the concentration of ozone in the upper stratosphere had increased, unlike in the lower stratosphere.

218. Mr. Gillett gave a presentation on the effects of future changes in atmospheric composition on the ozone layer. Action taken under the Montreal Protocol had led to falls in the atmospheric concentration of ozone-depleting substances; the overall level was expected to return to 1980 values by around 2050 in mid-latitudes and around 2075 in the Antarctic. As concentrations of ozone-depleting substances declined, however, greenhouse gases would become progressively more significant in terms of impact on ozone; carbon dioxide and methane tended to increase ozone levels, whereas nitrous oxide tended to reduce it. Projected ozone changes therefore depended on future efforts to control greenhouse gas emissions. They would also vary by region; ozone recovery to 1980 levels was expected to occur before the middle of the century in the mid-latitudes and the Arctic, and somewhat later in the Antarctic, while significant reductions in ozone levels were projected for the tropics, unless global methane emissions increased substantially.

219. Ms. Maycock gave a presentation on the effects on climate of ozone depletion and recovery. Overall, ozone depletion had cooled the stratosphere, an effect reinforced by increasing concentrations of carbon dioxide. That cooling had been particularly marked over the Antarctic during the austral spring and summer and had also contributed to a poleward movement of westerly winds, and an increase in their strength, in the southern hemisphere. In turn, that was linked to regional changes in climate, including changes in surface temperatures, increased rainfall in southern mid-latitudes and the subtropics and changes in oceanic circulation. An increase in the stratospheric concentration of ozone would tend to reverse those changes, but that would be counteracted by increases in the levels of greenhouse gases. Given that most ozone-depleting substances were themselves greenhouse gases, the implementation of the Montreal Protocol had prevented a significant surface warming of the planet that would have occurred had emissions continued unabated.

220. Mr. Velders gave a presentation on HFCs and climate protection through the Kigali Amendment. He pointed out that rising HFC emissions could offset the climate benefits already achieved under the Montreal Protocol, with a business-as-usual projection of an increase in emissions equivalent to 9–29 per cent of the growth in global carbon dioxide emissions from 2015 to 2050. While HFC emissions had historically emanated mainly from the United States and the European Union, future emissions were projected mainly from developing countries. The implementation of the Amendment, however, would reduce HFC emissions from developed countries from 1.0 to 0.2 gigatonnes of carbon dioxide equivalent per year and from developing countries from 3–4 to some 1 gigatonnes of carbon dioxide equivalent per year, by 2050. That would reduce the contribution of HFCs to global warming by 2100 from 0.5°C to some 0.06°C. HFC regulations already in place in several countries demonstrated that it would be possible to achieve the aims of the Amendment.

221. Ms. Thompson gave a presentation on ozone monitoring. She stressed that global monitoring of ozone at all levels of the atmosphere was vital to continued understanding of impact, especially in the poles and the tropics, the most sensitive regions. Whereas there was a continuous record of satellite data, some satellite instruments were nearing the end of their lifetimes, and data collection from ozone balloons and other ground-based instruments had not been as consistent. The need for monitoring of ozone levels was becoming more acute as the climate changed; as the troposphere warmed, feedback mechanisms between smog, methane and tropospheric ozone and ozone recovery were largely unknown.

222. Responding to questions from the moderator, Mr. Fioletov confirmed that scientists could say with a high degree of confidence that stratospheric ozone levels were no longer falling. While there was some evidence that levels had begun to rise, the signal was difficult to distinguish from the substantial degree of annual variability. Mr. Gillett added that the successful implementation of the Montreal Protocol was contributing to the recovery of the ozone layer, but that was also affected by

levels of greenhouse gases, meaning that it was unlikely to recover fully to its pre-1980 state. Indeed, most scenarios suggested a further reduction of ozone levels in the tropics.

223. The panellists then responded to questions from the floor. Commenting on the links between climate change and ozone depletion, Mr. Gillett observed that the net effect was the result of interactions between complex chemical and physical processes. Emissions of greenhouse gases cooled the stratosphere, which tended to lead to an increase in ozone levels, and also changed the stratospheric circulation, bringing more ozone to the polar regions. At the same time, rising concentrations of carbon dioxide and methane increased ozone production whereas nitrous oxide reduced it. The net effect on the Antarctic was not, however, significant. Commenting on the impact of ozone depletion on weather patterns in the Arctic, Ms. Maycock confirmed that there was no evidence of any long-term changes, although there was some evidence to suggest short-term changes in particularly severe winters. Climate change was also expected to lead to an increase in the intensity of tropical storms and a rise in associated rainfall, but there was no strong evidence to suggest that it would cause a change in their usual paths.

224. On the implementation of the Kigali Amendment, Mr. Velders observed that scenarios for projections of future uses of HFCs depended on several assumptions. It had been assumed, for example, that future consumption levels in developing countries would not be higher than current consumption levels in the United States, but it was possible that a higher demand for air conditioning could emerge in particularly hot countries and with increasing climate change. Monitoring of atmospheric levels of HFCs would be especially important in understanding whether those projections and assumptions were proving accurate. While the contribution of HFCs to current levels of global warming was extremely small, at about only 2 per cent of the total, it was currently growing by 5–10 per cent per year, and action to reduce those emissions was essential to meeting the goal of limiting global warming to less than 2°C. That could be achieved in two main ways: through regulatory controls on HFCs, thus creating incentives for industry to develop alternatives, and by realizing improvements in energy efficiency levels as equipment was replaced. The implementation of the Amendment would hold down the contribution of HFCs to global warming to about 2 per cent of the total, whereas in its absence HFC emissions were projected to grow to about 10–15 per cent of the total.

225. On the topic of ozone measurements in the tropics, Mr. Thompson confirmed that it was proving challenging to provide regular and consistent measurements. That was of particular concern because the tropics were an important region for the production of greenhouse gases; methane emissions from the tropics had recently increased, and it was unclear why. It was difficult to identify specific sources and processes when the gas was well distributed throughout the global atmosphere.

226. Responding to a question about the possibility of future surprises, similar to the discovery of the ozone hole, Mr. Gillett stated that the potential for future reductions in ozone levels in the tropics, relating to changes in stratospheric circulation, with an accompanying rise in levels of ultraviolet radiation, was a matter of concern that needed further study. Mr. Thompson added that not enough was known about the interactions of chlorine gases, reactive nitrogen, organic molecules, particles and aerosols. Ms. Maycock added that scientists still did not know why the coverage of Antarctic sea ice had remained relatively stable in recent years, climate change notwithstanding, but had then experienced a sharp fall in the past year. It could be related to ozone depletion and changing weather patterns, but further research was needed. Lastly, while 2017 had seen a smaller ozone hole over the Antarctic than in previous years, that was probably due to natural variation rather than any unanticipated process, although that was not yet certain.

227. Expressing thanks to the presenters for their contributions, the moderator summarized the main messages of the session. She said that the action taken to implement the Montreal Protocol had led to a reduction in emissions of ozone-depleting substances, which in turn was causing a recovery of the ozone layer to its pre-1980 levels. Ozone levels were, however, subject to considerable annual variation, and the hole in the ozone layer had not yet closed. The evolution of the ozone layer over the remainder of the century would depend on interactions with levels of carbon dioxide, methane and nitrous oxide. Ozone depletion over the Antarctic was causing changes in the climate in the southern hemisphere in the summer. Compliance with the Kigali Amendment would be essential to avoid the positive impact of the Protocol for the climate being counteracted by the growth in emissions of HFCs. As atmospheric concentrations of ozone and other gases changed, it would be important to continue to monitor them. In conclusion, she said, while there was some good news, much work remained to be done, and the contribution of accomplished and dedicated scientists would remain as vital as ever.

C. Statements by heads of delegation

228. During the high-level segment, statements were made by the heads of delegation of the following parties, listed in the order in which they spoke: Micronesia (Federated States of), China, European Union, Bahamas, Slovakia, Bahrain, Nigeria, United States of America, Kiribati, Guatemala, Kuwait, Pakistan, United Republic of Tanzania, Bangladesh, Uzbekistan, Chile, Brazil, Maldives, Germany, Malaysia, India, Uganda, Luxembourg, Japan, France, Comoros, Italy, Sri Lanka, Côte d'Ivoire, Nepal, Syrian Arab Republic, Cambodia, Mongolia, Ecuador, Swaziland, Ethiopia, Lao People's Democratic Republic, Dominican Republic, Indonesia, Philippines, Egypt, Sierra Leone and Sudan. Statements were also made by the representatives of the International Institute of Refrigeration and the Alliance for Responsible Atmospheric Policy.

229. Many representatives expressed thanks to the Government and people of Canada for their hospitality in hosting the current meeting. Many also expressed thanks to the Ozone Secretariat, the secretariat of the Multilateral Fund, UNEP, the implementing agencies, donor partners, the assessment panels, international organizations and other stakeholders for their role in ensuring the success of the meeting in particular and of the Montreal Protocol in general.

230. Many representatives paid tribute to the achievements under the Montreal Protocol and of the parties thereto in controlling and phasing out ozone-depleting substances and assisting the recovery of the ozone layer, with several pointing to recent research demonstrating that the depletion of the ozone layer was indeed being reversed. Several alluded to the historic noteworthiness of the thirtieth anniversary of the Protocol, and the appropriateness of celebrating that anniversary in the city that had given the Protocol its name. Some representatives mentioned the additional benefits arising from activities under the Protocol, including a reduction in skin cancer and positive climate impacts. Several expressed pride at their countries' ratification of the Protocol and its amendments, reiterating their commitment to achieving the objectives of the instrument.

231. A number of representatives pointed to the factors that had contributed to the success of the Montreal Protocol. Effective partnership and multi-stakeholder collaboration with a range of actors inside and outside the United Nations system, including public-private partnerships and cooperation between international and scientific organizations and non-governmental organizations, was a key aspect. One representative referred to the role of industry in the analysis and identification of environmental challenges, definition of objectives, policy development, implementation and the commercialization and distribution of technological solutions. The development of strong and effective institutional frameworks to support the implementation of the Protocol, and a transparent mechanism to provide technical and financial assistance to developing countries to help them to meet their phase-out obligations, had also been crucial. Some representatives said that the main reason that the Protocol was widely considered to be one of the most successful global environmental treaties was the existence of its own financial mechanism to assist developing countries, in the form of the Multilateral Fund. Several representatives said that the application of the principle of shared but differentiated responsibility had facilitated cooperation between parties operating under paragraph 1 of Article 5 and those not so operating to achieve the objectives of the Protocol, while mention was also made of the precautionary principle, and that of basing policies and action on sound science, supported by a robust and independent scientific and review process.

232. Several representatives drew attention to the progress made, both globally and nationally, in phasing out ozone-depleting substances under the Montreal Protocol. Following their historical success in phasing out CFCs, many countries had moved to focus on the phase-out of HCFCs through the implementation of HCFC phase-out management plans, with the assistance of the Multilateral Fund and the implementing and bilateral agencies. Several representatives said that their countries were phasing out HCFCs ahead of schedule. One representative highlighted the challenges still faced in phasing out HCFCs and introducing alternatives in smaller informal enterprises and in the servicing sector.

233. There was considerable discussion of the next important stage in the existence of the Montreal Protocol: the implementation of the Kigali Amendment, adopted in response to the increased consumption and production of HFCs with a high global-warming potential as an unintended consequence of the phase-out of HCFCs. Several representatives said that the factors that had contributed to the success of the Protocol in phasing out ozone-depleting substances, including its organizational structure, financial mechanisms and capacity-assistance programmes, served as fitting preparations for the implementation of the Amendment and the inclusion of HFCs under the auspices of the Protocol. One representative said that the Amendment contained all the elements that had led to the success of the Protocol: quantitative reduction targets that could be monitored, clear and fair deadlines that respected the equity principle and the economic means needed for the effective

implementation of obligations. Another said that the Amendment provided the most efficient and rational mechanism to achieve the transition from ozone-depleting substances to the next generation of energy-efficient compounds and technologies for air conditioning, refrigeration, foam insulation, solvent cleaning, fire protection and other critical uses. A number of representatives expressed satisfaction at the potential of the Amendment to achieve significant co-benefits for the ozone layer and for climate change, including through synergies with the Paris Agreement under the United Nations Framework Convention on Climate Change. Several representatives stressed the importance of the Amendment for those countries, including small island developing States, that were increasingly threatened by adverse climate events, including sea-level rise, hurricanes and glacial melting. One representative said that the implementation of the Amendment would be assisted by the fact that, compared with the very complex world of climate action, the Amendment was relatively straightforward and clearly defined.

234. Several representatives said that their Governments had already ratified or were ratifying the Kigali Amendment, with a number urging other parties to do so. Satisfaction was expressed that the 20-party threshold for the entry into force of the Amendment had been attained. Some representatives said that they had submitted proposals for activities to facilitate ratification, the related development of licensing systems and capacity-building activities for the adoption of alternatives to HFCs. The representative of Japan said that his country was processing its portion of the pledge, made at the Montreal Protocol donor declaration event held in New York in September 2016, to contribute $27 million to support enabling activities for the HFC phase-down.

235. Several representatives said that their countries' efforts to control ozone-depleting substances under the Montreal Protocol, and HFCs under the Kigali Amendment, were part of a wider commitment to sustainable development and the protection of the environment and human health. Some mentioned that those activities contributed to their efforts to achieve the Sustainable Development Goals, including Goal 12 on sustainable consumption and production. Several representatives stressed the importance of energy efficiency as a component of a climate-smart, sustainable economy and a green, environmentally aware lifestyle, describing national policies and strategies designed to promote that agenda. One representative drew attention to his country's new "blue-green budget", containing elements that recognized the economic potential of and the need to protect the oceans and the environment. Some noted that they were members of supportive international organizations, such as the Climate and Clean Air Coalition and the recently launched Powering Past Coal Alliance.

236. There was broad recognition that several challenges still needed to be overcome in implementing the Kigali Amendment, including identifying energy-efficient alternatives, addressing safety, flammability and toxicity concerns, leveraging adequate funding, the availability and transfer of technology and capacity-building, especially in the refrigeration, air-conditioning and heat pump sectors. The inadequate availability and suitability of alternatives in high-ambient-temperature conditions were of particular concern for several parties, including the expected growth in stockpiles of HFCs owing to the lack of acceptable alternatives. Concern was also expressed at the lack of alternatives in the fisheries sector. One representative said that the methodology for gathering data for HFCs needed to be user friendly in order to ease the reporting burden on parties operating under paragraph 1 of Article 5. Funding for institutional strengthening for HFC data collection and reporting should take into account the particular contexts of least developed countries and small island developing States. Another representative urged the Secretariat and the World Customs Organization to expedite the establishment of the Harmonized System code for HFCs in order to facilitate enabling activities under the Kigali Amendment.

237. One representative, speaking on behalf of a group of countries, said that moving from refrigerants with a high global-warming potential to low-global-warming-potential or zero-global-warming-potential alternatives could be done in a way that profited the environment and achieved cost savings for users. Cooperation with other organizations and institutions could help to take advantage of synergies and contribute to increased energy efficiency. Another representative said that the work of the International Climate Initiative had shown that alternative technology existed for most areas of application and could be deployed in difficult climatic conditions, the challenging logistics notwithstanding. Another representative said that the implementation of the Kigali Amendment would promote innovation and competition between enterprises and improve the quality and affordability of alternative technology.

238. With regard to financing activities under the Montreal Protocol and the Kigali Amendment, the 2018–2020 replenishment of the Multilateral Fund was of critical importance. Some representatives called for donor countries to increase their support to the Fund at a rate commensurate with the challenges associated with the implementation of the Amendment. Another representative called for

more transparent decision-making on the funding levels for low-volume-consuming countries and more recognition of the funding requirements of countries covering larger geographical areas. The representative of the European Union reassured parties operating under paragraph 1 of Article 5 that his organization remained committed to a stable and sufficient level of funding for the upcoming phase-out of ozone-depleting substances, recognizing the importance of making funding available for enabling activities under the Amendment, including for demonstration projects for countries that were willing to be early movers to tackle HFCs. He also called upon those parties with sufficient resources to provide funding to the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention to ensure the continued growth of knowledge in that area. The representative of Germany said that her country had consistently contributed 10 per cent of the financial support needed for parties operating under paragraph 1 of Article 5, while the representative of Japan said that his country had, since 1991, covered nearly 20 per cent of the total contributions made to the Multilateral Fund. The representative of Italy said that his country had provided additional financial and technical support through the Fund to promote enabling activities under the Amendment.

239. Several representatives described continued action in their countries to phase out ozone-depleting substances and to implement the Montreal Protocol and comply with its provisions, including through legislative, policy, institutional and programmatic measures and the implementation of HCFC phase-out management plans. A number stressed the value of the quota and licensing systems that they had put in place and of the training provided to customs officials and servicing technicians in the refrigeration and air-conditioning sectors. In addition, several representatives described activities and initiatives that were being implemented in their countries to promote low-global-warming-potential alternatives to ozone-depleting substances and to take early action in accordance with the Kigali Amendment, including the implementation of pilot projects on the application of ozone-friendly technology with low global-warming potential.

240. Several representatives affirmed their continued commitment to meeting their obligations under the Montreal Protocol within their wider commitment to the sustainable development agenda, notwithstanding the considerable challenges being faced by several countries, including those affected by conflict and political unrest. One representative encouraged parties to continue to be guided by the spirit of cooperation and mutual respect that had always been the hallmark of the United Nations. Another said that the great success achieved in reducing the risk of depletion of the ozone layer was a stimulus to continued cooperation to the benefit of all humanity. Lastly, one representative stated that the parties to the Protocol continued to show that, by working together with determination, sustainable solutions could be found and outstanding results delivered at the global level.

VI. Report of the co-chairs of the preparatory segment and consideration of the decisions recommended for adoption by the Conference of the Parties to the Vienna Convention at its eleventh meeting and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol

241. The Co-Chair of the preparatory segment reported that the work of the segment had concluded successfully, and draft decisions had been approved for consideration and adoption during the high-level segment. She expressed thanks to all concerned for their hard work and for the spirit of cooperation and professionalism that had been evident throughout the negotiations.

242. With regard to the draft decision on replenishment of the Multilateral Fund for the triennium 2018–2020, the representative of Belarus stated that, given the spirit of flexibility that the parties had shown, and the determination of Belarus to fulfil its obligations under the Montreal Protocol, he was withdrawing his request for a footnote to be added to the draft decision. Belarus would also begin the ratification of the Kigali Amendment. Nevertheless, it should be recorded that the amount of contributions proposed for Belarus was too high, and it would be irresponsible of Belarus to accept an obligation that it would not be able to meet. To avoid non-compliance with a decision of the parties, Belarus intended to consider the difference between the feasible amount of $77,000 per year and the amount of $141,167 per year, the Belarus' annual contribution to the Multilateral Fund indicated in the table, as a voluntary contribution. The representative of Azerbaijan said that she too regarded the contribution allocated to her country in the draft decision, which represented an increase on previous contributions, as unaffordable. She also stated that to avoid non-compliance with a decision of the parties, the same consideration as in the case of Belarus would apply to Azerbaijan.

VII. Dates and venues for the twelfth meeting of the Conference of the Parties to the Vienna Convention and the Thirtieth Meeting of the Parties to the Montreal Protocol

243. The representative of Ecuador expressed the willingness of the Government of Ecuador to host the Thirtieth Meeting of the Parties, in 2018. The representative of Italy said that his Government was exploring the possibility of hosting the Thirty-First Meeting of the Parties, in 2019. The representative of Senegal said that his Government intended to discuss with the Secretariat the possibility of hosting the twelfth meeting of the Conference of the Parties to the Vienna Convention and the Thirty-Second Meeting of the Parties, in 2020.

VIII. Other matters

244. The parties took up no other matters during the high-level segment.

IX. Adoption of decisions by the Conference of the Parties to the Vienna Convention at its eleventh meeting

245. The Conference of the Parties decides:

Decision XI/1: Recommendations of the tenth meeting of the Ozone Research Managers of the Parties to the Vienna Convention

Recalling that, pursuant to the objectives defined in decision I/6 of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer, the Ozone Research Managers of the Parties to the Vienna Convention review ongoing national and international research and monitoring programmes with a view to ensuring the proper coordination of those programmes and identifying gaps that need to be addressed,

Recognizing the need to improve the understanding and accuracy of future projections of global ozone amounts, including ozone layer recovery,

Recognizing also the importance of continuing and enhancing existing observation capabilities for ozone layer and climate variables owing to the changing atmospheric composition and the strong coupling between the behaviour of the ozone layer and changes in climate,

Noting the importance of capacity-building activities in developing countries and countries with economies in transition in order to expand their ability to participate in research and systematic observations relating to the ozone layer and the changing climate,

1. To take note with appreciation of the report of the tenth meeting of the Ozone Research Managers of the Parties to the Vienna Convention, published in 2017;[1]

2. To encourage parties to adopt and implement, as appropriate, the recommendations of the Ozone Research Managers under the topics of research, systematic observations, data archiving and stewardship and capacity-building;

3. Also to encourage parties to accord priority to:

(a) Research and systematic observation activities on processes influencing the evolution of the ozone layer and its links to climate, including the prioritization of new measurement locations to optimize the co-location of ozone measurements with observations of other atmospheric species and parameters;

(b) Capacity-building activities in developing countries and countries with economies in transition, in particular through the continuation and expansion of regular calibration and intercomparison campaigns and through the provision of assistance to enable those parties to expand their scientific capacity and participate in ozone research activities, including assessment activities under the Montreal Protocol on Substances that Deplete the Ozone Layer;

4. To encourage the national ozone focal points to improve communication with the meteorological agencies and other relevant organizations in their countries on monitoring, research and scientific activities;

[1] World Meteorological Organization Global Ozone Research and Monitoring Project Report No. 57.

Decision XI/2: General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention

Recalling decision VI/2, by which the Conference of the Parties established 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 noting that the current life of the Trust Fund will expire at the end of 2019,

Noting with appreciation the contributions to the Trust Fund by several parties and the joint efforts of the World Meteorological Organization and the Secretariat in the implementation of the activities funded from the Trust Fund since it became operational in 2003,

Noting that important activities, including calibrations, inter-comparisons and relevant training, have been implemented successfully under the Trust Fund to date,

Noting with great concern, however, that the resources available in the Trust Fund are not sufficient to enable substantial and sustainable improvements to be made to the global ozone observing system,

Noting that the coming decade remains a crucial time during which the status of the recovery of the ozone layer will become clearer, but that such clarity will be dependent on continued high-quality observations,

Aware that improvements in ozone observations should take into account the existing strong and intricate linkages between ozone and climate and of the need to carry out relevant observations and analyses for both ozone and climate wherever possible,

Noting with appreciation the work of the Advisory Committee of the Trust Fund, including on the long-term strategy and short-term plan of action for the Trust Fund prepared for consideration by the Conference of the Parties pursuant to decision X/3,

1. To request the Executive Director of the United Nations Environment Programme to extend the life of the General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention until 31 December 2026;

2. To request the Advisory Committee of the Trust Fund, with the assistance of the World Meteorological Organization and the Secretariat, to implement its long-term strategy and short-term plan of action for the Trust Fund, paying particular attention to:

(a) Identifying gaps and needs in research and monitoring of ozone and related climate variables and parameters, complementing the ongoing efforts of the Ozone Research Managers of the Parties to the Vienna Convention and other relevant programmes such as the World Meteorological Organization Global Atmosphere Watch programme;

(b) Exploring the use of new and cost-effective instrumentation to replace ageing instruments with regard to the projects under consideration by the Advisory Committee;

(c) Fostering stronger relationships with scientific institutions and related global networks to build capacity and the infusion of knowledge for the activities under its consideration;

(d) Developing a strategic plan for mobilizing public and financial resources and in-kind contributions for the Trust Fund, to safeguard necessary research and observation activities, and submit it to the Conference of the Parties to the Vienna Convention at its twelfth meeting and inform the parties to the Convention annually through the Secretariat on the progress made, in conjunction with the action set out in paragraph 3 (a) below;

3. To request the Secretariat:

(a) To continue to invite parties and relevant international organizations, including space agencies, scientific and research institutions, United Nations entities, international financial institutions and the private sector, as appropriate, to make financial and/or in-kind contributions towards well-defined and well-budgeted project proposals developed under the Trust Fund;

(b) To report to the Conference of the Parties at its twelfth meeting on the operation of, contributions to and expenditure from the Trust Fund and on the activities funded from the Trust Fund since its inception, as well as on the activities of the Advisory Committee;

Decision XI/3: Financial reports and budgets for the Vienna Convention for the Protection of the Ozone Layer

Recalling decision X/4 on financial reports and budgets for the Vienna Convention for the Protection of the Ozone Layer,

Taking note of the financial report on the Trust Fund for the Vienna Convention for the Protection of the Ozone Layer for the fiscal year 2016,[2]

Recognizing that voluntary contributions, once agreed upon, are an essential complement for the effective implementation of the Vienna Convention,

Welcoming the continued efficient management by the Secretariat of the finances of the Trust Fund for the Vienna Convention,

1. To express its appreciation to the Government of Canada for the generous hosting of and contribution towards the joint eleventh meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, and to allocate 50 per cent of that contribution, entitled "Contribution for the organization of the joint 29th Meeting of the Parties to the Montreal Protocol and the 11th meeting of the Conference of the Parties to the Vienna Convention", to the Trust Fund for the Vienna Convention to be reflected in the financial statement for 2017;

2. To take note with appreciation of the financial report of the Trust Fund for the fiscal year 2016 and the report on the actual expenditures for 2016 as compared to the approved budget for that year;

3. To reaffirm a working capital reserve equivalent to 15 per cent of the annual operational budgets for the triennium 2018–2020 to be used to meet the final expenditures under the Trust Fund;

4. To approve the revised budget for 2017 for the Trust Fund in the amount of $1,308,964, the budget for 2018 in the amount of $788,167, the budget for 2019 in the amount of $800,981 and the budget for 2020 in the amount of $1,370,010, as set out in annex I to the present report;

5. Also to approve the contributions to be paid by the parties of $733,000 in 2018, $863,000 in 2019 and $986,000 in 2020, as set out in annex II to the present report;

6. To authorize the Secretariat to draw down from the cash balance the funds required to cover the shortfall between the level of contributions agreed upon in paragraph 5 above and the approved budgets for 2018, 2019 and 2020 as set out in paragraph 4 above;

7. To urge all parties to pay any outstanding contributions and their future contributions promptly and in full;

8. To note with concern that a number of parties have not paid their contributions for 2017 and prior years, and to urge those parties to pay both their outstanding contributions and their future contributions promptly and in full;

9. To request the Executive Secretary, and to invite the President of the Bureau of the Conference of the Parties, to enter into discussions with any party whose contributions have been outstanding for two or more years with a view to finding a way forward, and to request the Executive Secretary to report to the Conference of the Parties at its twelfth meeting on the outcome of the discussions;

10. To further consider how to address outstanding contributions to the Trust Fund at its twelfth meeting, and to request the Executive Secretary to continue to publish and regularly update information on the status of contributions to the Trust Fund;

11. To request the Secretariat to ensure the full utilization of programme support costs available to it in the triennium 2018–2020 and in later years, and where possible, to offset those costs against the administrative components of the approved budget;

12. Also to request the Secretariat to indicate in future financial reports of the Trust Fund the amounts of cash on hand in the section entitled "Total reserves and fund balances", in addition to contributions that have not yet been received;

[2] UNEP/OzL.Conv.11/4/Add.1.

13. To request the Executive Secretary to prepare results-based budget and work programmes for the triennium 2021–2023, presenting two budget scenarios and work programmes based on the projected needs for the biennium in:

(a) A zero nominal growth scenario;

(b) A scenario based on further recommended adjustments to the first scenario and the added costs or savings related thereto.

Decision XI/4: Twelfth meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer

To convene the twelfth meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer back to back with the Thirty-Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer.

X. Adoption of decisions by the Twenty-Ninth Meeting of the Parties to the Montreal Protocol

246. The Twenty-Ninth Meeting of the Parties decides:

Decision XXIX/1: Replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the triennium 2018–2020

1. To adopt a budget for the Multilateral Fund for the Implementation of the Montreal Protocol for the triennium 2018–2020 of $540,000,000, on the understanding that $34,000,000 of that budget will be provided from anticipated contributions due to the Multilateral Fund and other sources for the triennium 2015–2017, and that $6,000,000 will be provided from interest accruing to the Fund during the triennium 2018–2020. The parties note that outstanding contributions from parties with economies in transition in the period 2015–2017 amount to $10,452,429;

2. Also to adopt the scale of contributions for the Multilateral Fund based on a replenishment of $166,666,667 for 2018, $166,666,667 for 2019 and $166,666,666 for 2020, as it appears in annex III to the report of the combined eleventh meeting of the Conference of the Parties to the Vienna Convention and the Twenty-Ninth meeting of the Parties to the Montreal Protocol;

3. That the Executive Committee should take action to ensure, to the extent possible, that the entire budget for the triennium 2018–2020 is committed by the end of 2020 and that parties not operating under paragraph 1 of Article 5 should make timely payments in accordance with paragraph 7 of decision XI/6;

Decision XXIX/2: Extension of the fixed-exchange-rate mechanism to the 2018–2020 replenishment of the Multilateral Fund

1. To direct the Treasurer to extend the fixed-exchange-rate mechanism to the period 2018–2020;

2. That parties choosing to pay their contributions to the Multilateral Fund for the Implementation of the Montreal Protocol in national currencies will calculate their contributions based on the average United Nations exchange rate for the six-month period commencing 1 January 2017;

3. That, subject to paragraph 4 below, parties not choosing to pay in national currencies pursuant to the fixed-exchange-rate mechanism will continue to pay in United States dollars;

4. That no party should change the currency selected for its contribution in the course of the triennium 2018–2020;

5. That only parties with inflation rate fluctuations of less than 10 per cent for the preceding triennium, pursuant to published figures of the International Monetary Fund, will be eligible to use the fixed-exchange-rate mechanism;

6. To urge parties to pay their contributions to the Multilateral Fund in full and as early as possible in accordance with paragraph 7 of decision XI/6;

7. To agree that, if the fixed-exchange-rate mechanism is to be used for the replenishment period 2021–2023, parties choosing to pay their contributions in national currencies will calculate their contributions based on the average United Nations exchange rate for the six-month period commencing 1 January 2020;

Decision XXIX/3: Kigali Amendment to the Montreal Protocol to phase down hydrofluorocarbons

1. To note that, as at 24 November 2017, 22 parties had ratified, approved or accepted the Kigali Amendment to the Montreal Protocol;

2. To urge all parties that have not yet done so to consider ratifying, approving or accepting the Kigali Amendment in order to ensure broad participation and achieve the goals of the Amendment;

Decision XXIX/4: Destruction technologies for controlled substances

Considering the chemical similarity of hydrofluorocarbons and hydrochlorofluorocarbons, and chlorofluorocarbons and halons, and taking note of the practice to often destroy them together,

Noting the need to approve destruction technologies for hydrofluorocarbons and to keep the list of approved destruction technologies annexed to decision XXIII/12 up to date,

1. To request the Technology and Economic Assessment Panel to report by 31 March 2018, and if necessary to submit a supplemental report to the Open-ended Working Group at its fortieth meeting, on:

(a) An assessment of the destruction technologies as specified in the annex to decision XXIII/12 with a view to confirming their applicability to hydrofluorocarbons;

(b) A review of any other technology for possible inclusion in the list of approved destruction technologies in relation to controlled substances;

2. To invite parties to submit to the Secretariat by 1 February 2018 information relevant to the tasks set out in paragraph 1 above;

Decision XXIX/5: Essential-use exemption for laboratory and analytical uses for 2018 in China

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

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

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

1. To authorize the level of consumption for China for 2018 necessary to satisfy essential uses of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water, as specified in the annex to the present decision;

2. To welcome the undertaking from China to cease the use of carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water from 2019 onwards;

Annex to decision XXIX/5

Essential-use authorization for 2018 for carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water

(tonnes)[a]

Party	*2018*
China	65

[a] Tonnes = metric tons.

Decision XXIX/6: Critical-use exemptions for methyl bromide for 2018 and 2019

Noting with appreciation the work of the Technology and Economic Assessment Panel and its Methyl Bromide Technical Options Committee,

Recognizing the significant reductions in critical-use nominations for methyl bromide by many parties,

Recalling paragraph 10 of decision XVII/9,

Recalling also that all parties that have nominated critical-use exemptions are to report data on stocks of methyl bromide using the accounting framework agreed to by the Sixteenth Meeting of the Parties,

Recognizing that the production and consumption of methyl bromide for critical uses should be permitted only if methyl bromide is not available in sufficient quantity and quality from existing stocks of banked or recycled methyl bromide,

Recognizing also that parties operating under critical-use exemptions should take into account the extent to which methyl bromide is available in sufficient quantity and quality from existing stocks of banked or recycled methyl bromide in licensing, permitting or authorizing the production and consumption of methyl bromide for critical uses,

Recalling decision Ex.I/4, by which parties with critical-use exemptions were requested to submit annual accounting frameworks,

Noting the progress made under the research programme of the Australian strawberry runner industry and that Australia is planning to move to alternatives if trials in 2018 and 2019 are successful and the registration of the alternatives is completed,

Noting also the progress made under the Canadian research programme and the commitment of Canada to submitting a progress report before the fortieth meeting of the Open-ended Working Group,

Noting with appreciation that China does not intend to submit further nominations for critical-use exemptions,

1. To permit, for the agreed critical-use categories for 2018 and 2019 set forth in table A of the annex to the present decision for each party, subject to the conditions set forth in the present decision and in decision Ex.I/4, to the extent that those conditions are applicable, the levels of production and consumption for 2018 and 2019 set forth in table B of the annex to the present decision, which are necessary to satisfy critical uses, with the understanding that additional production and consumption and categories of use may be approved by the Meeting of the Parties in accordance with decision IX/6;

2. That parties shall endeavour to license, permit, authorize or allocate quantities of methyl bromide for critical uses as listed in table A of the annex to the present decision;

3. That each party that has an agreed critical-use exemption shall renew its commitment to ensuring that the criteria in paragraph 1 of decision IX/6, in particular the criterion laid down in paragraph 1 (b) (ii) of decision IX/6, are applied in licensing, permitting or authorizing critical uses of methyl bromide, with each party requested to report on the implementation of the present provision to the Secretariat by 1 February for the years to which the present decision applies;

4. That parties submitting future requests for critical-use nominations for methyl bromide shall also comply with paragraph 1 (b) (iii) of decision IX/6 and that parties not operating under paragraph 1 of Article 5 shall demonstrate that research programmes are in place to develop and deploy alternatives to and substitutes for methyl bromide;

Annex to decision XXIX/6

Table A

Agreed critical-use categories
(tonnes)[a]

2019	
Australia	Strawberry runners 28.98
2018	
Argentina	Strawberry fruit 29.0 Tomatoes 47.7
Canada	Strawberry runners (Prince Edward Island) 5.261
China	Ginger, open field 68.88 Ginger, protected 18.36
South Africa	Mills 2.9 Houses 42.75

[a] Tonnes = metric tons.

Table B

Permitted levels of production and consumption[a]
(tonnes)[b]

2019	
Australia	28.98
2018	
Argentina	76.7
Canada	5.261
China	87.24
South Africa	45.65

[a] Minus available stocks.
[b] Tonnes = metric tons.

Decision XXIX/7: Use of controlled substances as process agents

Taking note with appreciation of the 2017 progress report of the Technology and Economic Assessment Panel, especially insofar as it pertains to process agents,

Recalling that table A of decision X/14 on process agents has been updated through decisions XV/6, XVII/7, XIX/15, XXI/3, XXII/8 and XXIII/7,

Noting that the Panel, in its 2017 progress report, takes account of the information provided by parties in accordance with decision XXI/3,

Noting also that, in its 2017 progress report, the Panel recommends the removal of three processes from table A of decision X/14, as updated through decision XXIII/7,

1. To update table A of decision X/14 as set out in the annex to the present decision;

2. To urge parties to update their information on the use of controlled substances as process agents and to provide the Secretariat, by 31 December 2017, with information on the implementation and development of emissions reduction techniques;

3. To request the Technology and Economic Assessment Panel to report to the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer at its forty-first meeting on the industrial application of any alternative technologies employed by parties in the processes listed in table A, as updated in the annex to the present decision;

Annex to decision XXIX/7

Table A

List of uses of controlled substances as process agents

No.	*Process agent application*	*Substance*	*Permitted parties*
1	Elimination of NCl3 in chlor-alkali production	CTC	European Union, Israel, United States of America
2	Recovery of chlorine by tail gas absorption from chlor-alkali production	CTC	European Union, United States of America
3	Production of chlorinated rubber	CTC	European Union
4	Production of chlorosulfonated polyolefin (CSM)	CTC	China
5	Production of aramid polymer (PPTA)	CTC	European Union
6	Production of synthetic fibre sheet	CFC-11	United States of America
7	Photochemical synthesis of perfluoropolyetherpolyperoxide precursors of Z-perfluoropolyethers and difunctional derivatives	CFC-12	European Union
8	Preparation of perfluoropolyether diols with high functionality	CFC-113	European Union
9	Production of cyclodime	CTC	European Union
10	Bromination of a styrenic polymer	BCM	United States of America
11	Production of high modulus polyethylene fibre	CFC-113	United States of America

Decision XXIX/8: Future availability of halons and their alternatives

Recognizing that global production of halons for controlled uses was eliminated in 2009, but that some remaining uses, in particular for civil aviation, will continue to rely on stocks of recovered, recycled or reclaimed halons for fire safety for the foreseeable future,

Noting the adoption by the Assembly of the International Civil Aviation Organization of resolutions A37-9 and A38-9, in which the Assembly expressed an urgent need to continue to develop and implement alternatives to halons for civil aviation,

Taking note of Assembly of the International Civil Aviation Organization resolution A39-13, by which the Assembly encouraged the International Civil Aviation Organization to continue collaboration with the Secretariat, through the Halons Technical Options Committee of the Technology and Economic Assessment Panel, on the topic of alternatives to halons for civil aviation,

Recalling the information provided by the Panel as requested under decision XXVI/7,

Taking note of the progress report of the Panel that was provided to the parties before the thirty-ninth meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, including the need mentioned therein for better information on existing halon inventories and emissions in civil aviation,

1. To request the Technology and Economic Assessment Panel, through its Halons Technical Options Committee:

(a) To continue to liaise with the International Civil Aviation Organization on the development and implementation of alternatives to halons, and their rate of adoption by civil aviation, and to report thereon in its 2018 progress report;

(b) To explore the possibility of forming a joint working group with the International Civil Aviation Organization to develop and thereafter carry out a study to determine the current and projected future quantities of halons installed in civil aviation fire protection systems, the associated uses and releases of halons from those systems and any potential courses of action that civil aviation could take to reduce those uses and releases;

(c) To submit a report on the work of the joint working group, if established under paragraph 1 (b) above, before the Thirtieth Meeting of the Parties and the fortieth session of the Assembly of the International Civil Aviation Organization for consideration and potential further action;

2. To invite parties, on a voluntary basis, to reassess any national import and export restrictions other than licensing requirements with a view to facilitating the import and export of recovered, recycled or reclaimed halons and the management of stocks of such halons with the aim of enabling all parties to meet remaining needs in accordance with national regulations even as they make the transition to alternatives to halons;

3. To encourage parties to refrain from destroying uncontaminated recovered, recycled or reclaimed halons before they have considered their national and the global long-term future needs for halons, and to consider retaining uncontaminated recovered, recycled or reclaimed halons for anticipated future needs in a manner that employs best practices for storage and maintenance, in order to minimize emissions;

Decision XXIX/9: Hydrochlorofluorocarbons and decision XXVII/5

Aware that parties not operating under paragraph 1 of Article 5 of the Montreal Protocol on Substances that Deplete the Ozone Layer are taking measures to reduce and eventually eliminate the production and consumption of the ozone-depleting substances listed in Annex C, group I (hydrochlorofluorocarbons),

Recognizing a need for continued consideration of issues related to hydrochlorofluorocarbons as indicated in paragraphs 12, 13 and 14 of decision XIX/6, and taking into consideration the report of the Technology and Economic Assessment Panel prepared in response to decisions XXVII/5 and XXVIII/8,

Noting that the Halons Technical Options Committee considers it possible that certain aircraft rescue and firefighting applications may continue to need clean agents between 2020 and 2030,

Noting also that the Medical and Chemicals Technical Options Committee has identified certain hydrochlorofluorocarbons used as solvents for which there may be a continued need in certain precision cleaning applications and manufacturing processes,

Recalling the procedure laid down in paragraph 9 of Article 2 of the Montreal Protocol for adjustments and reductions in production and consumption of controlled substances,

1. To request the Technology and Economic Assessment Panel, in relation to Annex C, group I, substances, to assess requirements for the period from 2020 to 2030 for parties not operating under paragraph 1 of Article 5 and to provide information on the following:

(a) Areas and volumes of possible needs in fire suppression sectors that may require the use of clean agents;

(b) Areas and volumes of possible needs for solvent applications, including servicing;

(c) Areas and volumes of possible other niche uses;

(d) Existing or emerging applications and processes for alternatives related to items (a) to (c) above and the possibility of meeting identified needs through the use of recycled or reclaimed hydrochlorofluorocarbons;

2. To invite parties and other interested entities to provide additional information to the Secretariat by 15 January 2018 for inclusion in the Panel's progress report;

3. To request the Panel to report on the assessment referred to above by 15 March 2018;

Decision XXIX/10: Issues related to energy efficiency while phasing down hydrofluorocarbons

Recalling decision XXVIII/2, in which the Meeting of the Parties, inter alia, requested the Executive Committee to develop cost guidance associated with maintaining and/or enhancing the energy efficiency of low-global-warming-potential (GWP) or zero-GWP replacement technologies and equipment when phasing down hydrofluorocarbons, while taking note of the role of other institutions addressing energy efficiency, when appropriate,

Recognizing the importance of maintaining and/or enhancing energy efficiency while transitioning away from high-GWP hydrofluorocarbons to low-GWP alternatives in the refrigeration, air-conditioning and heat pump sectors,

Noting that the use of air conditioning and refrigeration is growing in countries operating under paragraph 1 of Article 5,

Recognizing that maintaining and/or enhancing energy efficiency could have significant climate benefits,

1. To request the Technology and Economic Assessment Panel in relation to maintaining and/or enhancing energy efficiency in the refrigeration, air-conditioning and heat-pump sectors, including in high-ambient-temperature conditions, while phasing down hydrofluorocarbons under the Kigali Amendment to the Montreal Protocol in parties operating under paragraph 1 of Article 5, to assess the following items:

(a) Technology options and requirements including:

(i) Challenges to their uptake;

(ii) Their long-term sustainable performance and viability;

(iii) Their environmental benefits in terms of carbon dioxide equivalents;

(b) Capacity-building and servicing sector requirements in the refrigeration and air-conditioning and heat-pump sectors;

(c) Related costs including capital and operating costs;

2. Also to request the Technology and Economic Assessment Panel to provide an overview of the activities and funding provided by other relevant institutions, as well as definitions, criteria and methodologies used in addressing energy efficiency in the refrigeration, air-conditioning and heat-pump sectors in relation to maintaining and/or enhancing energy efficiency in the refrigeration, air-conditioning and heat-pump sectors while phasing down hydrofluorocarbons under the Kigali Amendment to the Montreal Protocol, as well as those related to low-GWP and zero-GWP hydrofluorocarbon alternatives including on different financing modalities;

3. To request the Technology and Economic Assessment Panel to prepare a final report for consideration by the Open-ended Working Group at its fortieth meeting, and thereafter an updated final report to be submitted to the Thirtieth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer taking into consideration the outcome of the workshop described in paragraph 4 below;

4. To request the Secretariat to organize a workshop on energy efficiency opportunities while phasing down hydrofluorocarbons at the fortieth meeting of the Open-ended Working Group;

Decision XXIX/11: Safety standards

Recalling decision XXVIII/4 on the establishment of regular consultations on safety standards,

Cognizant of the importance of ensuring safe market introduction, manufacturing, operation, maintenance and handling of zero global-warming-potential (GWP) and low-GWP refrigerants that are alternatives to hydrochlorofluorocarbons and hydrofluorocarbons,

Recognizing that safety standards must maintain or enhance the current level of protection of workers, users and property,

Taking note with appreciation of the report on safety standards for flammable low-GWP refrigerants of the Technology and Economic Assessment Panel's task force on decision XXVIII/4 and the outcomes of the workshop on safety standards relevant to the safe use of low-GWP alternatives held in Bangkok on 10 July 2017,

1. To request the Secretariat to hold regular consultations with the relevant standards bodies referred to in paragraph 7 of decision XXVIII/4 with a view to providing, with regard to standards for flammable low-GWP refrigerants, a tabular overview of relevant safety standards, drawing on the 2017 report of the task force on decision XXVIII/4 and the outcome of the consultations. The tabular overview should also include any relevant information submitted on a voluntary basis to the Secretariat by parties or by national and regional standards bodies;

2. That the overview shall provide concise information on the:

(a) Scope of activities, appliances or products covered;

(b) Content, namely the safety and relevant technical aspects addressed;

(c) Responsible standards body and its subsidiary body in charge of the standard, including hyperlinks to publicly accessible contact details as well as to information on content and review process;

(d) Status of the review (process and content under review);

3. To invite parties to update information submitted pursuant to decision XXVIII/4 by 1 January 2020;

4. To request the Secretariat to make the information referred to in paragraphs 1 and 2 of the present decision accessible on its website and to ensure an update of the tabular overview at least prior to each meeting of the parties up until the Thirty-Fourth Meeting of the Parties, when parties should consider whether to renew that request to the Secretariat;

Decision XXIX/12: Consideration of hydrofluorocarbons not listed as controlled substances in Annex F to the Protocol

Recalling decision XXVIII/1, by which the Meeting of the Parties adopted the amendment to the Montreal Protocol on phasing down hydrofluorocarbons listed in Annex F to the Protocol,

Acknowledging that the substances listed in Annex F to the Protocol include those hydrofluorocarbons that are at present commercially in use,

Noting, however, that there are other hydrofluorocarbons not listed in Annex F to the Protocol, which at present have minimal or no known production or consumption, which have global warming potential no less than the lowest global warming potential of the hydrofluorocarbons listed in Annex F,

To request the assessment panels under the Montreal Protocol to provide in their quadrennial reports to be presented to the Thirty-Fifth Meeting of the Parties, in 2023, and every four years thereafter, information on the consumption and production of hydrofluorocarbons not listed in Annex F of the Protocol which have global warming potential no less than the lowest global warming potential of the hydrofluorocarbons listed in Annex F, noting that this is for information purposes only, given that the substances referred to in the present paragraph are not included in Annex F;

Decision XXIX/13: Data and information provided by the parties in accordance with Article 7 of the Montreal Protocol

1. To note with appreciation that all 197 parties that should have reported data for 2016 have done so and that 180 of those parties had reported their data by 30 September 2017 as required under paragraph 3 of Article 7 of the Montreal Protocol on Substances that Deplete the Ozone Layer;

2. To note with appreciation that 130 of those parties had reported their data by 30 June 2017 in accordance with decision XV/15 and that reporting by 30 June each year greatly facilitates the work of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol in assisting parties operating under paragraph 1 of Article 5 of the Protocol to comply with the control measures under the Protocol;

3. To encourage parties to continue to report consumption and production data as soon as figures are available, and preferably by 30 June each year, as agreed in decision XV/15;

Decision XXIX/14: Non-compliance in 2015 and 2016 with the provisions of the Montreal Protocol governing consumption of the controlled substance in Annex C, group I (hydrochlorofluorocarbons), by Kazakhstan

Noting that Kazakhstan ratified the Montreal Protocol on Substances that Deplete the Ozone Layer on 26 August 1998, the London Amendment on 26 July 2001, the Copenhagen Amendment and the Montreal Amendment on 28 June 2011 and the Beijing Amendment on 19 September 2014, and is classified as a party not operating under paragraph 1 of Article 5 of the Protocol,

Noting also that the Global Environment Facility has approved the amount of $5,688,452 to enable Kazakhstan to achieve compliance with the Protocol,

1. To recall decision XXVI/13, in which the Twenty-Sixth Meeting of the Parties noted that Kazakhstan was in non-compliance with the consumption control measures under the Montreal Protocol on Substances that Deplete the Ozone Layer for hydrochlorofluorocarbons in the years 2011, 2012 and 2013 but also noted with appreciation the plan of action submitted by Kazakhstan to ensure its prompt return to compliance with those measures by 2016;

2. To note with concern that Kazakhstan has reported annual consumption of the controlled substance in Annex C, group I (hydrochlorofluorocarbons), for 2015 of 12.1 ODP-tonnes and for 2016 of 5.0 ODP-tonnes, which is inconsistent with its commitment contained in decision

XXVI/13 to reduce its consumption of hydrochlorofluorocarbons to no greater than 9.9 ODP-tonnes in 2015 and 3.95 ODP-tonnes in 2016 and with the Protocol's requirement to limit consumption to no greater than 3.95 ODP-tonnes for each of those years, and that the party was therefore in non-compliance with the consumption control measures for that substance under the Protocol for 2015 and 2016;

3. To note with appreciation the submission by Kazakhstan of an explanation for that deviation along with a revised plan of action to return to compliance with the Protocol's hydrochlorofluorocarbon control measures under which, without prejudice to the operation of the financial mechanism of the Protocol, Kazakhstan specifically commits itself to reducing its consumption of hydrochlorofluorocarbons to no greater than:

(a) 7.5 ODP-tonnes in 2017, 2018 and 2019;

(b) 6.0 ODP-tonnes in 2020;

(c) 3.95 ODP-tonnes in 2021;

(d) 0.5 ODP-tonnes in 2022, 2023 and 2024;

(e) Zero ODP-tonnes by 1 January 2025, save for consumption restricted to the servicing of refrigeration and air-conditioning equipment between the period from 2020 to 2030, as prescribed in the Protocol;

4. To continue to monitor closely progress by Kazakhstan with regard to the implementation of its plan of action and the phase-out of hydrochlorofluorocarbons, and that, to the degree that the party is working towards and meeting the specific Protocol control measures, it should continue to be treated in the same manner as a party in good standing and, in that regard, should continue to receive international assistance to enable it to meet its commitments in accordance with item A of the indicative list of measures that may be taken by the Meeting of the Parties in respect of non-compliance, as set out in annex V to the report of the Fourth Meeting of the Parties;[3]

5. To caution Kazakhstan, under item B of the indicative list of measures that may be taken by the Meeting of the Parties in respect of non-compliance, that, should it fail to return to compliance, the Meeting of the Parties will consider measures consistent with item C of the indicative list of measures, which allows for the suspension of specific rights and privileges under the Protocol, and that this may include the possibility of actions available under Article 4, such as ensuring that the supply of hydrochlorofluorocarbons that are the subject of non-compliance is ceased so that exporting parties are not contributing to a continuing situation of non-compliance;

Decision XXIX/15: Request for the revision of baseline data by Fiji

Noting that, in decision XIII/15, the Thirteenth Meeting of the Parties decided to advise parties requesting changes in reported baseline data for the base years to present their requests before the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, which in turn would work with the Secretariat and the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol to confirm the justification for the changes and present them to the Meeting of the Parties for approval,

Noting also that decision XV/19 sets out the methodology for the submission of such requests,

1. That Fiji has presented sufficient information, in accordance with decision XV/19, to justify its request for the revision of its consumption data for hydrochlorofluorocarbons for the years 2009 and 2010, which are part of the baseline for parties operating under paragraph 1 of Article 5;

2. To approve the request by Fiji, and to revise its consumption data for hydrochlorofluorocarbons for the baseline years 2009 and 2010, as indicated in the following table:

	Previous hydrochlorofluorocarbon data (ODP-tonnes)			*New hydrochlorofluorocarbon data (ODP-tonnes)*		
	2009	*2010*	*Baseline*[a]	*2009*	*2010*	*Baseline*[a]
	7.6	9.2	8.4	5.00	6.46	5.73

[a] Hydrochlorofluorocarbon baselines established after the Twenty-Third Meeting of the Parties are presented using two decimal places whereas those established before are presented using one decimal place (see decision XXIII/30).

[3] UNEP/OzL.Pro.4/15.

3. To note that the change in baseline data confirmed that Fiji was in non-compliance with the control measures under the Montreal Protocol on Substances that Deplete the Ozone Layer for 2013 and 2014, but that as at 2015 the party had returned to compliance;

4. Also to note that no further action is needed in view of the return to compliance and the party's affirmation that it has taken the new baseline into account for 2015 and 2016;

5. To monitor closely progress by Fiji with regard to the phase-out of hydrochlorofluorocarbons, and that, to the degree that the party is working towards and meeting the specific Protocol control measures, it should continue to be treated in the same manner as a party in good standing;

Decision XXIX/16: Request for the revision of baseline data by Pakistan

Noting that, in decision XIII/15, the Thirteenth Meeting of the Parties decided to advise parties requesting changes in reported baseline data for the base years to present their requests before the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, which in turn would work with the Secretariat and the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol to confirm the justification for the changes and present them to the Meeting of the Parties for approval,

Noting also that decision XV/19 sets out the methodology for the submission of such requests,

1. That Pakistan has presented sufficient information, in accordance with decision XV/19, to justify its request for the revision of its consumption data for hydrochlorofluorocarbons for the years 2009 and 2010, which are part of the baseline for parties operating under paragraph 1 of Article 5;

2. To approve the request by Pakistan, and to revise its consumption data for hydrochlorofluorocarbons for the baseline years 2009 and 2010, as indicated in the following table:

	Previous hydrochlorofluorocarbon data (ODP-tonnes)			*New hydrochlorofluorocarbon data (ODP-tonnes)*		
Substance	*2009*	*2010*	*Baseline*[a]	*2009*	*2010*	*Baseline*[a]
HCFC-141b	134.2	142.8		134.20	142.80	
HCFC-142b	–	–		4.62	4.68	
HCFC-22	105.6	112.2		101.69	108.22	
Total	**239.8**	**255.0**	**247.4**	**240.51**	**255.70**	**248.11**

[a] Hydrochlorofluorocarbon baselines established after the Twenty-Third Meeting of the Parties are presented using two decimal places whereas those established before are presented using one decimal place (see decision XXIII/30).

Decision XXIX/17: Request for the revision of baseline data by the Philippines

Noting that, in decision XIII/15, the Thirteenth Meeting of the Parties decided to advise parties requesting changes in reported baseline data for the base years to present their requests before the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, which in turn would work with the Secretariat and the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol to confirm the justification for the changes and present them to the Meeting of the Parties for approval,

Noting also that decision XV/19 sets out the methodology for the submission of such requests,

1. That the Philippines has presented sufficient information, in accordance with decision XV/19, to justify its request for the revision of its consumption data for hydrochlorofluorocarbons for both 2009 and 2010, which are part of the baseline for parties operating under paragraph 1 of Article 5;

2. To approve the request by the Philippines, and to revise its consumption data for hydrochlorofluorocarbons for the baseline years 2009 and 2010, as indicated in the following table:

Previous hydrochlorofluorocarbon data (ODP-tonnes)			*New hydrochlorofluorocarbon data (ODP-tonnes)*		
2009	*2010*	*Baseline*[a]	*2009*	*2010*	*Baseline*[a]
194.7	222.0	208.4	162.98	160.98	161.98

[a] Hydrochlorofluorocarbon baselines established after the Twenty-Third Meeting of the Parties are presented using two decimal places whereas those established before are presented using one decimal place (see decision XXIII/30).

Decision XXIX/18: Reporting of zero in Article 7 data reporting forms

Recalling decision XXIV/14, in which the Twenty-Fourth Meeting of the Parties recalled the need for consistent reporting of production, imports, exports and destruction of ozone-depleting substances in accordance with Article 7 of the Montreal Protocol on Substances that Deplete the Ozone Layer and noted that the forms for reporting in accordance with Article 7 submitted by parties sometimes contained blank cells, in which no numbers indicating quantities of ozone-depleting substances were entered, and that such blank cells could be intended by a party in a given case to indicate zero controlled substances or, alternatively, could represent non-reporting by that party in respect of those substances,

Recalling also that, by decision XXIV/14, the Twenty-Fourth Meeting of the Parties requested the parties, when reporting production, imports, exports or destruction, to enter a number, including zero, where appropriate, in each cell in the data reporting forms that they submitted, rather than leaving the cell blank, and asked the Secretariat to request clarification from any party that submitted a form containing a blank cell,

1. To note with appreciation that the majority of parties are complying with the request made in decision XXIV/14 to enter a number, including zero, where appropriate, in each cell in the data reporting forms that they submit, rather than leaving the cell blank;

2. To note, however, that some parties are continuing to submit forms containing blank cells, which requires additional work by the Secretariat to request clarification from the parties and results in delays in compiling information and assessing parties' compliance with the control measures under the Montreal Protocol on Substances that Deplete the Ozone Layer;

3. To urge the parties, when submitting forms for reporting data in accordance with Article 7, to ensure that all cells in the forms are completed with a number, including zero, where appropriate, rather than leaving the cell blank;

4. To request the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol to review the status of compliance by the parties with paragraph 3 of the present decision at its sixty-first meeting.

Decision XXIX/19: Special considerations for the Caribbean islands affected by hurricanes

Noting with appreciation the successful efforts and sustained commitment of the Governments of Antigua and Barbuda, the Bahamas, Cuba, Dominica and the Dominican Republic to maintain compliance with their obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer,

Recognizing the extraordinary difficulties now faced by the above-mentioned countries as a result of the category 5 hurricanes that occurred in September and October 2017, which had devastating effects on the physical, economic and social welfare of the people of those islands,

Appreciating the commitment of the above-mentioned countries to meeting their obligations in respect of phasing out ozone-depleting substances under the Montreal Protocol and the amendments thereto,

1. To encourage all parties to assist Antigua and Barbuda, the Bahamas, Cuba, Dominica and the Dominican Republic by controlling the export of products, equipment, and technologies that rely on ozone-depleting substances through the control of trade, as appropriate, in accordance with decision X/9 and decision XXVII/8;

2. To request the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, when considering project proposals over the coming year for the above-mentioned countries, to take into account their exceptional situation and the special difficulties

that that situation may pose with regard to the implementation of activities to comply with their obligations in the coming year;

3. To request the implementing agencies to consider providing appropriate assistance to the above-mentioned countries in the areas of institutional strengthening, capacity-building, data collection and monitoring and control of trade of controlled substances to support continued reporting to the Secretariat on the consumption of controlled substances;

4. That the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol should, in its deliberations in 2018, take into consideration the difficulties faced by the above-mentioned countries as a result of the hurricanes experienced in 2017, in the event of cases of non-compliance by those countries;

5. To recognize that the exceptional situation of the above-mentioned countries may extend beyond one year, and to request the relevant parties to provide an update on the situation at the Thirtieth Meeting of the Parties;

Decision XXIX/20: Membership of the Technology and Economic Assessment Panel

Recalling that the terms of reference for the Technology and Economic Assessment Panel established in decision XXIV/8 provide for a limited number of senior experts for specific expertise not covered by the Panel's co-chairs or technical options committee co-chairs;

1. To thank the Technology and Economic Assessment Panel for its outstanding reports, and also to thank the individual members of the Panel for their outstanding service and dedication;

2. Also to thank Mohamed Besri (Morocco) for his long and outstanding efforts on behalf of the Montreal Protocol on Substances that Deplete the Ozone Layer as Co-Chair of the Methyl Bromide Technical Options Committee;

3. Further to thank Ashley Woodcock (United Kingdom of Great Britain and Northern Ireland) for his outstanding efforts on behalf of the Montreal Protocol as interim Co-Chair of the Flexible and Rigid Foams Technical Options Committee;

4. To endorse the appointment of Ian Porter (Australia) and Marta Pizano (Colombia) as Co-Chairs of the Methyl Bromide Technical Options Committee for an additional term of four years;

5. Also to endorse the appointment of Helen Tope (Australia) as Co-Chair of the Medical and Chemicals Technical Options Committee for an additional term of four years;

6. Further to endorse the appointment of Roberto Peixoto (Brazil) as Co-Chair of the Refrigeration, Air-Conditioning and Heat Pumps Technical Options Committee for an additional term of four years;

7. To endorse the appointment of Sergey Kopylov (Russian Federation) as Co-Chair of the Halons Technical Options Committee for an additional term of four years;

8. Also to endorse the appointment of Helen Walter-Terrinoni (United States of America) as Co-Chair of the Flexible and Rigid Foams Technical Options Committee for a term of four years;

9. Further to endorse the appointment of Sidi Menad Si Ahmed (Algeria) as senior expert of the Technology and Economic Assessment Panel for a term of one year;

10. To endorse the appointment of Shiqiu Zhang (China) as senior expert of the Panel for a term of one year;

11. Also to endorse the appointment of Marco González (Costa Rica) as senior expert of the Panel for a term of one year;

12. Further to endorse the appointment of Mohamed Besri (Morocco) as senior expert of the Panel for a term of one year;

13. To encourage parties to consult one another on potential nominations of senior experts and to refer to the matrix of expertise needed prior to making nominations for appointments of senior experts to the Panel;

14. To request the Secretariat to add to the agenda for the fortieth meeting of the Open-ended Working Group consideration of senior expert nominations from parties;

Decision XXIX/21: Membership of the Implementation Committee

1. To note with appreciation the work carried out by the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol in 2017;

2. To confirm the positions of the Congo, Georgia, Jordan, Paraguay and the United Kingdom of Great Britain and Northern Ireland as members of the Committee for one further year and to select Australia, Chile, Maldives, Poland and South Africa as members of the Committee for a two-year period beginning on 1 January 2018;

3. To note the selection of Miruza Mohamed (Maldives) to serve as President and Lesley Dowling (Australia) to serve as Vice-President and Rapporteur of the Committee for one year, beginning on 1 January 2018;

Decision XXIX/22: Membership of the Executive Committee of the Multilateral Fund

1. To note with appreciation the work carried out by the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol with the assistance of the Fund secretariat in 2017;

2. To endorse the selection of Argentina, Benin, the Dominican Republic, Grenada, India, Lebanon and Nigeria as members of the Executive Committee, representing parties operating under paragraph 1 of Article 5 of the Protocol, and the selection of Belgium, Canada, France, Japan, Norway, Slovakia and the United States of America as members representing parties not so operating, for one year beginning 1 January 2018;

3. To note the selection of Mazen Hussein (Lebanon) to serve as Chair and Philippe Chemouny (Canada) to serve as Vice-Chair of the Executive Committee for one year beginning 1 January 2018;

Decision XXIX/23: Co-Chairs of the Open-ended Working Group of the Parties to the Montreal Protocol

To endorse the selection of Yaqoub Almatouq (Kuwait) and Cynthia Newberg (United States of America) as Co-Chairs of the Open-ended Working Group of the Parties to the Montreal Protocol in 2018;

Decision XXIX/24: Financial reports and budgets for the Montreal Protocol on Substances that Deplete the Ozone Layer

Recalling decision XXVIII/16 on financial reports and budgets for the Montreal Protocol on Substances that Deplete the Ozone Layer,

Taking note of the financial report on the Trust Fund for the Montreal Protocol on Substances that Deplete the Ozone Layer for the fiscal year 2016,[4]

Recognizing that voluntary contributions, once agreed upon, are an essential complement for the effective implementation of the Montreal Protocol,

Welcoming the continued efficient management by the Secretariat of the finances of the Trust Fund,

1. To express its appreciation to the Government of Canada for the generous hosting of and contribution towards the joint eleventh meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, and to allocate 50 per cent of that contribution, entitled “Contribution for the organization of the joint Twenty-Ninth Meeting of the Parties to the Montreal Protocol and the eleventh meeting of the Conference of the Parties to the Vienna Convention”, to the Trust Fund for the Montreal Protocol to be reflected in the financial statement for 2017;

2. To approve the revised budget for 2017 in the amount of $5,145,954 and the budget of $5,546,722 for 2018, as set out in annex IV to the present report;

[4] UNEP/OzL.Pro.29/4/Add.1.

3. Also to approve the contributions to be paid by the parties of $5,546,722 for 2018, and to note the contributions of $5,594,470 for 2019, as set out in annex V to the present report;

4. That the contributions of individual parties for 2018 and indicative contributions for 2019 shall be as listed in annex V to the present report;

5. To reaffirm a working capital reserve at a level of 15 per cent of the annual budget to be used to meet the final expenditures under the Trust Fund;

6. To encourage parties, non-parties and other stakeholders to contribute financially and through other means to assist members of the three assessment panels and their subsidiary bodies with a view to ensuring their continued participation in assessment activities under the Montreal Protocol;

7. To note with concern that a number of parties have not paid their contributions for 2017 and prior years, and to urge those parties to pay both their outstanding contributions and their future contributions promptly and in full;

8. To request the Executive Secretary, and to invite the President of the Bureau of the Meeting of the Parties, to enter into discussions with any party whose contributions are outstanding for two or more years with a view to finding a way forward, and to request the Executive Secretary to report to the Thirtieth Meeting of the Parties on the outcome of those discussions;

9. To further consider how to address outstanding contributions to the Trust Fund at the Thirtieth Meeting of the Parties, and to request the Executive Secretary to continue to publish and regularly update information on the status of contributions to the Trust Fund;

10. To request the Secretariat to ensure the full utilization of programme support costs available to it in 2018 and later years, and where possible, to offset those costs against the administrative components of the approved budget;

11. Also to request the Secretariat to indicate in future financial reports of the Trust Fund the amounts of cash on hand in the section entitled “Total reserves and fund balances”, in addition to contributions that have not yet been received;

12. To request the Executive Secretary to prepare results-based budgets and work programmes for the years 2019 and 2020, presenting two budget scenarios and work programmes based on the projected needs for the biennium in:

(a) A zero nominal growth scenario;

(b) A scenario based on further recommended adjustments to the above-mentioned scenario and the added costs or savings related thereto.

Decision XXIX/25: Thirtieth Meeting of the Parties to the Montreal Protocol

To convene the Thirtieth Meeting of the Parties to the Montreal Protocol in Ecuador, in November 2018.

XI. Adoption of the report of the eleventh meeting of the Conference of the Parties to the Vienna Convention and the Twenty-Ninth Meeting of the Parties to the Montreal Protocol

247. The parties adopted the present report on Saturday, 25 November 2017, on the basis of the draft report set out in documents UNEP/OzL.Conv.11/L.1-UNEP/OzL.Pro.29/L.1 and UNEP/OzL.Conv.11/L.1/Add.1-UNEP/OzL.Pro.29/L.1/Add.1 and UNEP/OzL.Conv.11/L.1/Add.2-UNEP/OzL.Pro.29/L.1/Add.2.

XII. Closure of the meeting

248. Following the customary exchange of courtesies, the meeting was declared closed at 1.50 a.m. on Saturday, 25 November 2017.

Annex I

Trust Fund for the Vienna Convention for the Protection of the Ozone Layer

Approved revised budget for 2017 and approved budgets for 2018, 2019 and 2020

(United States dollars)

Budget line	*Cost category*	*Approved revised 2017*	*Approved 2018*	*Approved 2019*	*Approved 2020*
1000	Employee salaries, allowances and benefits	555 875	566 993	578 333	589 898
Operating costs					
1300	**Meeting costs**				
1322	Conference Services costs: preparatory meetings and meetings of the parties	252 000	–	–	252 000
1324	Conference Services costs: Bureau meetings	20 000	–	–	20 000
1327	Conference Services costs: Ozone Research Managers meeting	15 000	–	–	20 000
1328	Promotional activities for the protection of the ozone layer	10 000	10 000	10 000	10 000
5401	Hospitality	10 000	–	–	15 000
	Subtotal, meeting costs	**307 000**	**10 000**	**10 000**	**317 000**
3300	**Travel of Article 5 parties**				
3304	Travel of Article 5 parties: Bureau meetings	20 000	–	–	20 000
3307	Travel of Article 5 parties: Ozone Research Managers meeting	150 000	–	–	160 000
	Subtotal, travel of Article 5 parties	**170 000**	–	–	**180 000**
1600	Staff travel on official business	30 000	30 000	30 000	30 000
Other operating costs: consumables and supplies					
4100	Expendable equipment	8 000	8 000	8 000	8 000
4203	Other office equipment	5 000	5 000	5 000	5 000
4205	Equipment and peripherals for paperless conferences	5 000	5 000	5 000	5 000
4300	Rental of premises	17 500	17 500	17 500	17 500
5100	Operation and maintenance of equipment	7 500	7 500	7 500	7 500
5200	Reporting costs	7 500	7 500	7 500	7 500
5202	Reporting costs (Ozone Research Managers)	5 000	–	–	5 000
5300	Sundry	40 000	40 000	40 000	40 000
	Subtotal, other operating costs: supplies and consumables	**95 500**	**90 500**	**90 500**	**95 500**
	Total direct costs	**1 158 375**	**697 493**	**708 833**	**1 212 398**
	Programme support costs (13 per cent)	150 589	90 674	92 148	157 612
	Grand total	**1 308 964**	**788 167**	**800 981**	**1 370 010**

Explanatory notes for the proposed revision to the approved budget for 2017 and the proposed budgets for 2018, 2019 and 2020 for the Trust Fund for the Vienna Convention for the Protection of the Ozone Layer

Cost category	*Budget line*	*Comment*
Employee salaries, allowances and benefits	1000	The 2017 costs include a decrease of $21,000, representing the cost of the abolished post of Research Assistant and an increase of $16,855 to align the costs to 2017 salary costs. The salary costs for 2018, 2019 and 2020 are increased by 2 per cent to provide for inflation.
Operating expenses		This section includes meeting costs, travel of Article 5 participants and hospitality.
	1300	Meeting costs Necessary funds may be transferred from the conference servicing budget lines should such services be required to be rendered either by individual consultancies or under corporate contracts. The current conference servicing costs are based on the following background and assumptions:
	1322	The conferencing costs of the eleventh and twelfth meetings of the Conference of the Parties to the Vienna Convention are shared with the Twenty-Ninth and Thirty-Second Meetings of the Parties to the Montreal Protocol since they will be held jointly in 2017 and 2020.
	1324	Bureau meetings are scheduled in 2017 and 2020. The first meeting in the year is held back to back with the meeting of the Ozone Research Managers and the second is held back to back with the meeting of the Bureau of the Meeting of the Parties to the Montreal Protocol. The meetings have provision for interpretation and document translation into the appropriate languages based on the membership of the Bureau.
	1327	The 2017 and 2020 budgets include conference services costs for the tenth and eleventh meetings of the Ozone Research Managers. Costs in 2017 were reduced owing to the provision of services by the World Meteorological Organization at a reduced rate. The 2020 budget is increased by $5,000 over the 2017 costs to cater for inflation.
	1328	A minimum amount of $10,000 is proposed for each year to cover activities in connection with the celebration of the International Day for the Protection of the Ozone Layer.
	5401	Hospitality costs cover the receptions at the meeting of the Ozone Research Managers and the joint Conference of the Parties and Montreal Protocol meetings. In 2017, the cost of the reception at the meeting of the Ozone Research Managers was reduced owing to favourable catering rates provided by the caterers at the World Meteorological Organization.
	3300	Travel of Article 5 participants: Considering that the meeting of the Conference of the Parties to the Vienna Convention is normally held jointly with the Meeting of the Parties to the Montreal Protocol, participation costs are borne by the Trust Fund for the Montreal Protocol. The Secretariat confirms that no funds from the budget lines in this section have been used to cover the cost of travel of representatives of non-Article 5 parties.
	3304	Participation costs are based on two Bureau meetings, in 2017 and 2020 respectively, for four participants from developing countries or countries with economies in transition, being held back to back with the meeting of the Ozone Research Managers and the meeting of the Conference of the Parties to the Vienna Convention.
	3307	For the tenth meeting of the Ozone Research Managers in 2017, the budget of $175,000 catered for the participation of 35 experts at an average cost of $5,000, taking into account not more than one person's travel costs per country, using the most appropriate and advantageous economy-class fare and United Nations daily subsistence allowances. However, 53 participants were funded at an average cost of $2,500 (note, however, that the costs are being finalized at the time of preparing the present document).

Cost category	*Budget line*	*Comment*
Travel on official business	1600	The budgets include travel of Secretariat officers in connection with the organization of the meetings of the Ozone Research Managers and the meetings of the Conference of the Parties, in addition to travel related to the provision of support to network and capacity-building meetings.
Other operating costs: consumables and supplies		The section includes expendable equipment, non-expendable equipment and rental of office premises, operation and maintenance of equipment, reporting costs, communication, freight and the costs of Ozone Day celebrations.
	4100–4205 and 5101	The budgets for expendable equipment, office equipment, equipment for peripherals for paperless conferences and operation and maintenance of equipment have been maintained at the approved 2017 levels. The Secretariat is maintaining its electronic data processing systems to make the documentation of the Protocol and the Convention available electronically to the parties. This requires periodic procurement of necessary peripherals and software licences and updating of existing computer servers. A minimum provision has been made to enable the Secretariat to replace some equipment each year.
	4300	The rental cost is shared with the Trust Fund for the Montreal Protocol. The budgets are maintained at the approved 2017 level. Nairobi rental rates are determined by the United Nations Controller.
	5200–5202	Reporting costs in 2017 and 2020 cater for the report of the meeting of the Ozone Research Managers, which is being reduced in 2017 and 2020 from $10,000 to $5,000, due to savings on printing and distribution since the document is distributed in electronic format. Other general reporting costs that cover editing and translation of general documents, among other things, are maintained at the approved level of $7,500.
	5300	Sundry includes communications, freight and Ozone Day celebration costs of $20,000, $15,000 and $5,000, respectively, and these are maintained at the approved 2017 level.

Annex II

Contributions by the parties to the Trust Fund for the Vienna Convention for the Protection of the Ozone Layer

	Party	*Adjusted United Nations scale 2018–2020*	*2018*	*2019*	*2020*
1	Afghanistan	0.000	–	–	–
2	Albania	0.000	–	–	–
3	Algeria	0.160	1 175	1 383	1 581
4	Andorra	0.000	–	–	–
5	Angola	0.000	–	–	–
6	Antigua and Barbuda	0.000	–	–	–
7	Argentina	0.888	6 510	7 665	8 757
8	Armenia	0.000	–	–	–
9	Australia	2.327	17 057	20 082	22 944
10	Austria	0.717	5 255	6 187	7 069
11	Azerbaijan	0.000	–	–	–
12	Bahamas	0.000	–	–	–
13	Bahrain	0.000	–	–	–
14	Bangladesh	0.000	–	–	–
15	Barbados	0.000	–	–	–
16	Belarus	0.000	–	–	–
17	Belgium	0.881	6 459	7 605	8 689
18	Belize	0.000	–	–	–
19	Benin	0.000	–	–	–
20	Bhutan	0.000	–	–	–
21	Bolivia (Plurinational State of)	0.000	–	–	–
22	Bosnia and Herzegovina	0.000	–	–	–
23	Botswana	0.000	–	–	–
24	Brazil	3.807	27 903	32 851	37 533
25	Brunei Darussalam	0.000	–	–	–
26	Bulgaria	0.000	–	–	–
27	Burkina Faso	0.000	–	–	–
28	Burundi	0.000	–	–	–
29	Cabo Verde	0.000	–	–	–
30	Cambodia	0.000	–	–	–
31	Cameroon	0.000	–	–	–
32	Canada	2.908	21 319	25 100	28 678
33	Central African Republic	0.000	–	–	–
34	Chad	0.000	–	–	–
35	Chile	0.397	2 912	3 429	3 917
36	China	7.887	57 812	68 066	77 767
37	Colombia	0.321	2 350	2 767	3 161
38	Comoros	0.000	–	–	–
39	Congo	0.000	–	–	–

	Party	*Adjusted United Nations scale 2018–2020*	*2018*	*2019*	*2020*
40	Cook Islands	0.000	–	–	–
41	Costa Rica	0.000	–	–	–
42	Côte d'Ivoire	0.000	–	–	–
43	Croatia	0.000	–	–	–
44	Cuba	0.000	–	–	–
45	Cyprus	0.000	–	–	–
46	Czechia	0.343	2 511	2 956	3 377
47	Democratic People's Republic of Korea	0.000	–	–	–
48	Democratic Republic of the Congo	0.000	–	–	–
49	Denmark	0.581	4 262	5 018	5 734
50	Djibouti	0.000	–	–	–
51	Dominica	0.000	–	–	–
52	Dominican Republic	0.000	–	–	–
53	Ecuador	0.000	–	–	–
54	Egypt	0.151	1 109	1 306	1 492
55	El Salvador	0.000	–	–	–
56	Equatorial Guinea	0.000	–	–	–
57	Eritrea	0.000	–	–	–
58	Estonia	0.000	–	–	–
59	Ethiopia	0.000	–	–	–
60	European Union	2.489	18 247	21 483	24 544
61	Fiji	0.000	–	–	–
62	Finland	0.454	3 328	3 918	4 477
63	France	4.838	35 464	41 754	47 705
64	Gabon	0.000	–	–	–
65	Gambia	0.000	–	–	–
66	Georgia	0.000	–	–	–
67	Germany	6.362	46 631	54 901	62 726
68	Ghana	0.000	–	–	–
69	Greece	0.469	3 438	4 047	4 624
70	Grenada	0.000	–	–	–
71	Guatemala	0.000	–	–	–
72	Guinea	0.000	–	–	–
73	Guinea-Bissau	0.000	–	–	–
74	Guyana	0.000	–	–	–
75	Haiti	0.000	–	–	–
76	Holy See	0.000	–	–	–
77	Honduras	0.000	–	–	–
78	Hungary	0.160	1 175	1 383	1 581
79	Iceland	0.000	–	–	–
80	India	0.734	5 379	6 333	7 236
81	Indonesia	0.502	3 679	4 331	4 948
82	Iran (Islamic Republic of)	0.469	3 438	4 047	4 624
83	Iraq	0.128	942	1 109	1 266

	Party	*Adjusted United Nations scale 2018–2020*	*2018*	*2019*	*2020*
84	Ireland	0.334	2 445	2 879	3 289
85	Israel	0.428	3 138	3 695	4 222
86	Italy	3.732	27 355	32 207	36 797
87	Jamaica	0.000	–	–	–
88	Japan	9.639	70 651	83 181	95 036
89	Jordan	0.000	–	–	–
90	Kazakhstan	0.190	1 394	1 641	1 875
91	Kenya	0.000	–	–	–
92	Kiribati	0.000	–	–	–
93	Kuwait	0.284	2 080	2 449	2 798
94	Kyrgyzstan	0.000	–	–	–
95	Lao People's Democratic Republic	0.000	–	–	–
96	Latvia	0.000	–	–	–
97	Lebanon	0.000	–	–	–
98	Lesotho	0.000	–	–	–
99	Liberia	0.000	–	–	–
100	Libya	0.124	912	1 074	1 227
101	Liechtenstein	0.000	–	–	–
102	Lithuania	0.000	–	–	–
103	Luxembourg	0.000	–	–	–
104	Madagascar	0.000	–	–	–
105	Malawi	0.000	–	–	–
106	Malaysia	0.321	2 350	2 767	3 161
107	Maldives	0.000	–	–	–
108	Mali	0.000	–	–	–
109	Malta	0.000	–	–	–
110	Marshall Islands	0.000	–	–	–
111	Mauritania	0.000	–	–	–
112	Mauritius	0.000	–	–	–
113	Mexico	1.429	10 474	12 331	14 089
114	Micronesia (Federated States of)	0.000	–	–	–
115	Monaco	0.000	–	–	–
116	Mongolia	0.000	–	–	–
117	Montenegro	0.000	–	–	–
118	Morocco	0.000	–	–	–
119	Mozambique	0.000	–	–	–
120	Myanmar	0.000	–	–	–
121	Namibia	0.000	–	–	–
122	Nauru	0.000	–	–	–
123	Nepal	0.000	–	–	–
124	Netherlands	1.476	10 817	12 735	14 550
125	New Zealand	0.267	1 956	2 303	2 631
126	Nicaragua	0.000	–	–	–
127	Niger	0.000	–	–	–
128	Nigeria	0.208	1 525	1 796	2 052

	Party	*Adjusted United Nations scale 2018–2020*	*2018*	*2019*	*2020*
129	Niue	0.000	–	–	–
130	Norway	0.845	6 197	7 295	8 335
131	Oman	0.113	825	971	1 109
132	Pakistan	0.000	–	–	–
133	Palau	0.000	–	–	–
134	Panama	0.000	–	–	–
135	Papua New Guinea	0.000	–	–	–
136	Paraguay	0.000	–	–	–
137	Peru	0.135	993	1 169	1 335
138	Philippines	0.164	1 204	1 418	1 620
139	Poland	0.837	6 138	7 227	8 257
140	Portugal	0.390	2 861	3 368	3 849
141	Qatar	0.268	1 963	2 312	2 641
142	Republic of Korea	2.030	14 882	17 521	20 018
143	Republic of Moldova	0.000	–	–	–
144	Romania	0.183	1 343	1 581	1 806
145	Russian Federation	3.075	22 538	26 535	30 317
146	Rwanda	0.000	–	–	–
147	Saint Kitts and Nevis	0.000	–	–	–
148	Saint Lucia	0.000	–	–	–
149	Saint Vincent and the Grenadines	0.000	–	–	–
150	Samoa	0.000	–	–	–
151	San Marino	0.000	–	–	–
152	Sao Tome and Principe	0.000	–	–	–
153	Saudi Arabia	1.141	8 364	9 848	11 251
154	Senegal	0.000	–	–	–
155	Serbia	0.000	–	–	–
156	Seychelles	0.000	–	–	–
157	Sierra Leone	0.000	–	–	–
158	Singapore	0.445	3 262	3 841	4 389
159	Slovakia	0.159	1 168	1 375	1 571
160	Slovenia	0.000	–	–	–
161	Solomon Islands	0.000	–	–	–
162	Somalia	0.000	–	–	–
163	South Africa	0.362	2 657	3 128	3 574
164	South Sudan	0.000	–	–	–
165	Spain	2.433	17 830	20 992	23 985
166	Sri Lanka	0.000	–	–	–
167	Sudan	0.000	–	–	–
168	Suriname	0.000	–	–	–
169	Swaziland	0.000	–	–	–
170	Sweden	0.952	6 977	8 215	9 386
171	Switzerland	1.135	8 320	9 796	11 192
172	Syrian Arab Republic	0.000	–	–	–

	Party	*Adjusted United Nations scale 2018–2020*	*2018*	*2019*	*2020*
173	Tajikistan	0.000	–	–	–
174	Thailand	0.290	2 124	2 501	2 857
175	The former Yugoslav Republic of Macedonia	0.000	–	–	–
176	Timor-Leste	0.000	–	–	–
177	Togo	0.000	–	–	–
178	Tonga	0.000	–	–	–
179	Trinidad and Tobago	0.000	–	–	–
180	Tunisia	0.000	–	–	–
181	Turkey	1.014	7 430	8 748	9 995
182	Turkmenistan	0.000	–	–	–
183	Tuvalu	0.000	–	–	–
184	Uganda	0.000	–	–	–
185	Ukraine	0.103	752	885	1 011
186	United Arab Emirates	0.601	4 408	5 190	5 930
187	United Kingdom of Great Britain and Northern Ireland	4.444	32 574	38 351	43 817
188	United Republic of Tanzania	0.000	–	–	–
189	United States of America	21.906	160 570	189 047	215 991
190	Uruguay	0.000	–	–	–
191	Uzbekistan	0.000	–	–	–
192	Vanuatu	0.000	–	–	–
193	Venezuela (Bolivarian Republic of)	0.569	4 168	4 907	5 606
194	Viet Nam	0.000	–	–	–
195	Yemen	0.000	–	–	–
196	Zambia	0.000	–	–	–
197	Zimbabwe	0.000	–	–	–
	Total	**100.000**	**733 000**	**863 000**	**986 000**

Annex III

Contributions by parties to the tenth replenishment of the Multilateral Fund (2018, 2019 and 2020) (replenishment at $540 million, of which $500 million from new contributions)

	Country	*United Nations scale of assessment for 2017*	*Adjusted United Nations scale of assessment with no party contributing more than 22 per cent*	*Annual contributions for 2018, 2019 and 2020 (United States dollars)*	*Average inflation rate for the period 2015–2017 (percentage)*[a]	*Qualifying for fixed exchange rate mechanism. 1=Yes; 0=No*	*Fixed exchange rate mechanism: users' currencies rate of exchange*[b]	*Fixed exchange mechanism: users national currencies*	*Fixed exchange mechanism: users' contribution amount in national currency*
1	Andorra	0.006	0.0091	15 167			0.92656	Euro	
2	Australia	2.337	3.5338	5 889 667	1.83	1	1.33011	Australian dollar	7 833 905
3	Austria	0.72	1.0887	1 814 500	1.38	1	0.92656	Euro	1 681 243
4	Azerbaijan	0.06	0.0907	151 167	6.1	1	1.766571	Azerbaijani manat	267 047
5	Belarus	0.056	0.0847	141 167	39.73	0	1.90247	Belarusian ruble	
6	Belgium	0.885	1.3382	2 230 333	1.62	1	0.92656	Euro	2 066 538
7	Bulgaria	0.045	0.0680	113 333	0.47	1	1.81244	Bulgarian lev	205 410
8	Canada	2.921	4.4168	7 361 333	1.41	1	1.33367	Canadian dollar	9 817 589
9	Croatia	0.099	0.1497	249 500	-0.18	1	6.88629	Croatian kuna	1 718 129
10	Cyprus	0.043	0.0650	108 333	-0.80	1	0.92656	Euro	100 377
11	Czechia	0.344	0.5202	867 000	1.15	1	24.78429	Czech koruna	21 487 979
12	Denmark	0.584	0.8831	1 471 833	0.55	1	6.891	Danish krone	10 142 404
13	Estonia	0.038	0.0575	95 833	1.05	1	0.92656	Euro	88 795
14	Finland	0.456	0.6895	1 149 167	0.34	1	0.92656	Euro	1 064 772
15	France	4.859	7.3473	12 245 500	0.39	1	0.92656	Euro	11 346 191
16	Germany	6.389	9.6608	16 101 333	0.86	1	0.92656	Euro	14 918 851
17	Greece	0.471	0.7122	1 187 000	-0.44	1	0.92656	Euro	1 099 827
18	Holy See	0.001	0.0015	2 500					
19	Hungary	0.161	0.2434	405 667	0.89	1	285.8943	Hungarian forint	115 977 788

	Country	*United Nations scale of assessment for 2017*	*Adjusted United Nations scale of assessment with no party contributing more than 22 per cent*	*Annual contributions for 2018, 2019 and 2020 (United States dollars)*	*Average inflation rate for the period 2015–2017 (percentage)[a]*	*Qualifying for fixed exchange rate mechanism. 1=Yes; 0=No*	*Fixed exchange rate mechanism: users' currencies rate of exchange[b]*	*Fixed exchange mechanism: users national currencies*	*Fixed exchange mechanism: users' contribution amount in national currency*
20	Iceland	0.023	0.0348	58 000	1.99	1	108.7457	Icelandic króna	6 307 251
21	Ireland	0.335	0.5066	844 333	-0.02	1	0.92656	Euro	782 325
22	Israel	0.43	0.6502	1 083 667	-0.27	1	3.66	New Israeli shekel	3 966 220
23	Italy	3.748	5.6673	9 445 500	0.51	1	0.92656	Euro	8 751 822
24	Japan	9.68	14.6371	24 395 167	0.36	1	112.6378	Yen	2 747 817 909
25	Kazakhstan	0.191	0.2888	481 333	14.23	0	319.2329	Tenge	
26	Latvia	0.05	0.0756	126 000	1.25	1	0.92656	Euro	116 747
27	Liechtenstein	0.007	0.0106	17 667	–	–	0.996556	Swiss franc	
28	Lithuania	0.072	0.1089	181 500	1.28	1	0.92656	Euro	168 171
29	Luxembourg	0.064	0.0968	161 333	0.89	1	0.92656	Euro	149 485
30	Malta	0.016	0.0242	40 333	1.09	1	0.92656	Euro	37 371
31	Monaco	0.01	0.0151	25 167	–	–	0.92656	Euro	
32	Netherlands	1.482	2.2409	3 734 833	0.79	1	0.92656	Euro	3 460 547
33	New Zealand	0.268	0.4052	675 333	1.29	1	1.417333	New Zealand dollar	957 172
34	Norway	0.849	1.2838	2 139 667	2.84	1	8.503444	Norwegian krone	18 194 536
35	Poland	0.841	1.2717	2 119 500	0.10	1	3.945543	Zloty	8 362 578
36	Portugal	0.392	0.5927	987 833	0.91	1	0.92656	Euro	915 287
37	Romania	0.184	0.2782	463 667	-0.76	1	4.187286	New leu	1 941 505
38	Russian Federation	3.088	4.6694	7 782 333	12.61	0	58.30429	Russian rouble	
39	San Marino	0.003	0.0045	7 500	0.62	1	0.92656	Euro	6 949
40	Slovakia	0.16	0.2419	403 167	0.04	1	0.92656	Euro	373 558
41	Slovenia	0.084	0.1270	211 667	0.29	1	0.92656	Euro	196 122
42	Spain	2.443	3.6941	6 156 833	0.46	1	0.92656	Euro	5 704 676

	Country	*United Nations scale of assessment for 2017*	*Adjusted United Nations scale of assessment with no party contributing more than 22 per cent*	*Annual contributions for 2018, 2019 and 2020 (United States dollars)*	*Average inflation rate for the period 2015–2017 (percentage)*[a]	*Qualifying for fixed exchange rate mechanism. 1=Yes; 0=No*	*Fixed exchange rate mechanism: users' currencies rate of exchange*[b]	*Fixed exchange mechanism: users national currencies*	*Fixed exchange mechanism: users' contribution amount in national currency*
43	Sweden	0.956	1.4456	2 409 333	0.94	1	8.898889	Swedish krona	21 440 390
44	Switzerland	1.14	1.7238	2 873 000	-0.40	1	0.996556	Swiss franc	2 863 105
45	Tajikistan	0.004	0.0060	10 000	8.31	1	8.293486	Tajik somoni	82 935
46	Ukraine	0.103	0.1557	259 500	37.47	0	26.85357	Ukrainian hryvnia	
47	United Kingdom of Great Britain and Northern Ireland	4.463	6.7485	11 247 500	1.29	1	0.796	Pound sterling	8 953 010
48	United States of America	22	22.0000	36 666 667	–	–	1	United States dollar	
49	Uzbekistan	0.023	0.0348	58 000	–	–	3570.311	Uzbek sum	
	Total	**73.584**	**100.00**	**166 666 667**					

Notes:

a As per the website of the International Monetary Fund as at 11 October 2017: http://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42.

b Average United Nations operational rate of exchange from 1 January–30 June 2017.

Annex IV

Trust Fund for the Montreal Protocol on Substances that Deplete the Ozone Layer

Approved revised 2017, approved 2018 and proposed 2019 budgets

(United States dollars)

	Cost category	*Approved revised 2017*	*Approved 2018*	*Proposed 2019*
1000	Employee salaries, allowances and benefits	1 483 072	1 512 734	1 542 989
1200	Consultants	85 000	85 000	85 000
Operating costs				
1300	**Meeting costs**			
1321	Conference services costs: Open-ended Working Group meetings	676 000	676 000	676 000
1322	Conference services costs: preparatory meetings and meetings of the parties	275 000	700 000	712 000
1323	Communication costs of Article 5 assessment panel members and organizational costs of panel meetings	70 000	70 000	70 000
1324	Conference services costs: Bureau meetings	25 000	25 000	25 000
1325	Conference services costs: Implementation Committee meetings	125 000	125 000	125 000
1326	Conference services costs: Montreal Protocol informal consultation meetings	10 000	0	0
5401	Hospitality	25 000	25 000	25 000
Subtotal, meeting costs		**1 206 000**	**1 621 000**	**1 633 000**
3300	**Travel of Article 5 parties and experts**			
3301	Travel of Article 5 parties: assessment panel meetings	400 000	400 000	400 000
3302	Travel of Article 5 parties: preparatory meetings and meetings of the parties	375 000	375 000	375 000
3303	Travel of Article 5 parties: Open-ended Working Group meetings	325 000	325 000	325 000
3304	Travel of Article 5 parties: Bureau meetings	20 000	20 000	20 000
3305	Travel of Article 5 parties: Implementation Committee meetings	125 000	125 000	125 000
3306	Travel of Article 5 parties: informal meeting consultations	10 000	0	0
Subtotal, travel of Article 5 parties and experts		**1 255 000**	**1 245 000**	**1 245 000**
1600	**Travel on official business**			
1601	Staff travel on official business	210 000	210 000	210 000
1602	Conference Services staff travel on official business	15 000	15 000	15 000
Subtotal, travel on official business		**225 000**	**225 000**	**225 000**
4100-5300	**Other operating costs: supplies and consumables**			
4100	Expendable equipment	18 000	18 000	18 000
4200	Non-expendable equipment	25 000	25 000	25 000
4300	Rental of premises	41 870	41 870	41 870
5100	Operational and maintenance of equipment	20 000	20 000	20 000
5200	Reporting costs	75 000	75 000	75 000
5300	Sundry	120 000	40 000	40 000

Cost category	*Approved revised 2017*	*Approved 2018*	*Proposed 2019*
Subtotal, other operating costs: supplies and consumables	**299 870**	**219 870**	**219 870**
Total direct costs	**4 553 942**	**4 908 603**	**4 950 858**
Programme support costs (13 per cent)	592 012	638 118	643 612
Grand total	**5 145 954**	**5 546 722**	**5 594 470**

Explanatory notes for the proposed revision to the approved budget for 2017 and the proposed budgets for 2018 and 2019 of the Trust Fund for the Montreal Protocol on Substances that Deplete the Ozone Layer

Cost category	*Budget line*	*Comment*
Employee salaries, allowances and benefits	1000	The 2018 and 2019 costs have been increased by 2 per cent to allow for inflation. The posts of the Senior Administrative Officer (P5) and the Senior Administrative Assistant (G7) are funded by the programme support cost budget. The post of Communications and Information Officer (P-3) is funded fully from the Trust Fund for the Vienna Convention.
Consultants	1200	Consultants are used by the Secretariat for meetings research and facilitation of the workshop on safety standards to be held on 11 July 2017. The approved amount for 2017 has been maintained for 2018 and 2019.
Operating expenses		This section includes meetings costs, travel of Article 5 participants and hospitality.
	1300	Meeting costs
	1321	Open-ended Working Group meetings The figure for 2017 is presented as an average cost across five duty stations: Bangkok, Montreal, Nairobi, Paris and Vienna. The costs will be adjusted based on the venue of the meetings.
	1322	Preparatory meetings and Meetings of the Parties In 2017, the joint eleventh Conference of the Parties/Twenty-Ninth Meeting of the Parties was hosted by the Government of Canada in Montreal. The meeting costs are reduced by $185,000, which represents the UNON cost estimate for interpretation services that was instead provided by the Government of Canada. In 2017, the meeting cost of the joint eleventh Conference of the Parties/Twenty-Ninth Meeting of the Parties is shared with the Trust Fund for the Vienna Convention, which has a budget of $252,000. In 2018 and 2019, the full meeting cost will be charged to the Trust Fund for the Montreal Protocol. The 2017 costs are presented as an average cost across five duty stations: Bangkok, Montreal, Nairobi, Paris and Vienna. The costs will be adjusted based on the venue of the meetings and whether they are hosted by a party.
	1324	One Bureau meeting is scheduled for each of the years 2017, 2018 and 2019, with provision for interpretation and document translation into appropriate languages, depending on the membership of the Bureau. The proposed costs have remained the same as for the approved figures for 2017.
	1325	The proposed budgets for Implementation Committee meetings in 2018 and 2019 have remained the same as the approved figures for 2017.
	5401	The hospitality costs cover receptions at the meetings of the Open-ended Working Group and the Meetings of the Parties. Necessary funds may be transferred from the conference servicing budget lines should such services be required, either through individual consultancies or corporate contracts. The costs for 2018 and 2019 remain constant at the 2017 approved level.

Cost category	*Budget line*	*Comment*
	3300	**Travel of Article 5 participants** The participation of representatives of parties operating under paragraph 1 of Article 5 in various Montreal Protocol meetings is budgeted at $5,000 per representative per meeting using the most appropriate and advantageous economy-class fare and United Nations daily subsistence allowances. The costs for 2018 and 2019 remain constant at the 2017 approved level. The Secretariat confirms that no funds from the budget lines in this section have been used to cover the cost of travel by representatives of non-Article 5 parties.
Travel on official business	1600	Travel on official business for 2018 and 2019 is maintained at the 2017 approved level.
Other operating costs: supplies and consumables	4100–5300	The section includes expendable equipment, non-expendable equipment and rental of office premises, reporting costs and sundry. The 2018 and 2019 proposed costs remain constant at the 2017 approved level, except for "Sundry", which includes $10,000 for communication, $10,000 for freight, $10,000 for training and $10,000 for Ozone Day celebrations, which is increased to $90,000 in 2017 to cover an enhanced plan to mark the thirtieth anniversary of the Montreal Protocol.

Annex V

Contributions by the parties to the Trust Fund for the Montreal Protocol on Substances that Deplete the Ozone Layer

(General Assembly resolution 70/245, with a maximum assessment rate of 22 per cent)

	Party	*Adjusted United Nations scale with 22 per cent maximum assessment rate considered*	*2018 contributions by parties*	*2019 contributions by parties*
1	Afghanistan	0.000	–	–
2	Albania	0.000	–	–
3	Algeria	0.160	8 892	8 969
4	Andorra	0.000	–	–
5	Angola	0.000	–	–
6	Antigua and Barbuda	0.000	–	–
7	Argentina	0.888	49 265	49 689
8	Armenia	0.000	–	–
9	Australia	2.327	129 072	130 183
10	Austria	0.717	39 765	40 108
11	Azerbaijan	0.000	–	–
12	Bahamas	0.000	–	–
13	Bahrain	0.000	–	–
14	Bangladesh	0.000	–	–
15	Barbados	0.000	–	–
16	Belarus	0.000	–	–
17	Belgium	0.881	48 878	49 299
18	Belize	0.000	–	–
19	Benin	0.000	–	–
20	Bhutan	0.000	–	–
21	Bolivia (Plurinational State of)	0.000	–	–
22	Bosnia and Herzegovina	0.000	–	–
23	Botswana	0.000	–	–
24	Brazil	3.807	211 143	212 961
25	Brunei Darussalam	0.000	–	–
26	Bulgaria	0.000	–	–
27	Burkina Faso	0.000	–	–
28	Burundi	0.000	–	–
29	Cabo Verde	0.000	–	–
30	Cambodia	0.000	–	–
31	Cameroon	0.000	–	–
32	Canada	2.908	161 326	162 715
33	Central African Republic	0.000	–	–
34	Chad	0.000	–	–
35	Chile	0.397	22 037	22 226
36	China	7.887	437 475	441 241

	Party	*Adjusted United Nations scale with 22 per cent maximum assessment rate considered*	*2018 contributions by parties*	*2019 contributions by parties*
37	Colombia	0.321	17 784	17 937
38	Comoros	0.000	–	–
39	Congo	0.000	–	–
40	Cook Islands	0.000	–	–
41	Costa Rica	0.000	–	–
42	Côte d'Ivoire	0.000	–	–
43	Croatia	0.000	–	–
44	Cuba	0.000	–	–
45	Cyprus	0.000	–	–
46	Czechia	0.343	18 999	19 163
47	Democratic People’s Republic of Korea	0.000	–	–
48	Democratic Republic of the Congo	0.000	–	–
49	Denmark	0.581	32 254	32 532
50	Djibouti	0.000	–	–
51	Dominica	0.000	–	–
52	Dominican Republic	0.000	–	–
53	Ecuador	0.000	–	–
54	Egypt	0.151	8 395	8 467
55	El Salvador	0.000	–	–
56	Equatorial Guinea	0.000	–	–
57	Eritrea	0.000	–	–
58	Estonia	0.000	–	–
59	Ethiopia	0.000	–	–
60	European Union	2.489	138 074	139 263
61	Fiji	0.000	–	–
62	Finland	0.454	25 185	25 402
63	France	4.838	268 361	270 671
64	Gabon	0.000	–	–
65	Gambia	0.000	–	–
66	Georgia	0.000	–	–
67	Germany	6.362	352 863	355 900
68	Ghana	0.000	–	–
69	Greece	0.469	26 013	26 237
70	Grenada	0.000	–	–
71	Guatemala	0.000	–	–
72	Guinea	0.000	–	–
73	Guinea-Bissau	0.000	–	–
74	Guyana	0.000	–	–
75	Haiti	0.000	–	–
76	Holy See	0.000	–	–
77	Honduras	0.000	–	–
78	Hungary	0.160	8 892	8 969
79	Iceland	0.000	–	–

	Party	*Adjusted United Nations scale with 22 per cent maximum assessment rate considered*	*2018 contributions by parties*	*2019 contributions by parties*
80	India	0.734	40 704	41 055
81	Indonesia	0.502	27 836	28 075
82	Iran (Islamic Republic of)	0.469	26 013	26 237
83	Iraq	0.128	7 125	7 186
84	Ireland	0.334	18 502	18 661
85	Israel	0.428	23 749	23 953
86	Italy	3.732	207 001	208 783
87	Jamaica	0.000	–	–
88	Japan	9.639	534 624	539 226
89	Jordan	0.000	–	–
90	Kazakhstan	0.190	10 549	10 640
91	Kenya	0.000	–	–
92	Kiribati	0.000	–	–
93	Kuwait	0.284	15 740	15 876
94	Kyrgyzstan	0.000	–	–
95	Lao People’s Democratic Republic	0.000	–	–
96	Latvia	0.000	–	–
97	Lebanon	0.000	–	–
98	Lesotho	0.000	–	–
99	Liberia	0.000	–	–
100	Libya	0.124	6 904	6 963
101	Liechtenstein	0.000	–	–
102	Lithuania	0.000	–	–
103	Luxembourg	0.000	–	–
104	Madagascar	0.000	–	–
105	Malawi	0.000	–	–
106	Malaysia	0.321	17 784	17 937
107	Maldives	0.000	–	–
108	Mali	0.000	–	–
109	Malta	0.000	–	–
110	Marshall Islands	0.000	–	–
111	Mauritania	0.000	–	–
112	Mauritius	0.000	–	–
113	Mexico	1.429	79 255	79 937
114	Micronesia (Federated States of)	0.000	–	–
115	Monaco	0.000	–	–
116	Mongolia	0.000	–	–
117	Montenegro	0.000	–	–
118	Morocco	0.000	–	–
119	Mozambique	0.000	–	–
120	Myanmar	0.000	–	–
121	Namibia	0.000	–	–
122	Nauru	0.000	–	–

	Party	*Adjusted United Nations scale with 22 per cent maximum assessment rate considered*	*2018 contributions by parties*	*2019 contributions by parties*
123	Nepal	0.000	–	–
124	Netherlands	1.476	81 850	82 555
125	New Zealand	0.267	14 802	14 929
126	Nicaragua	0.000	–	–
127	Niger	0.000	–	–
128	Nigeria	0.208	11 543	11 642
129	Niue	0.000	–	–
130	Norway	0.845	46 890	47 294
131	Oman	0.113	6 241	6 295
132	Pakistan	0.000	–	–
133	Palau	0.000	–	–
134	Panama	0.000	–	–
135	Papua New Guinea	0.000	–	–
136	Paraguay	0.000	–	–
137	Peru	0.135	7 511	7 576
138	Philippines	0.164	9 113	9 191
139	Poland	0.837	46 448	46 848
140	Portugal	0.390	21 650	21 836
141	Qatar	0.268	14 857	14 985
142	Republic of Korea	2.030	112 613	113 583
143	Republic of Moldova	0.000	–	–
144	Romania	0.183	10 162	10 250
145	Russian Federation	3.075	170 549	172 018
146	Rwanda	0.000	–	–
147	Saint Kitts and Nevis	0.000	–	–
148	Saint Lucia	0.000	–	–
149	Saint Vincent and the Grenadines	0.000	–	–
150	Samoa	0.000	–	–
151	San Marino	0.000	–	–
152	Sao Tome and Principe	0.000	–	–
153	Saudi Arabia	1.141	63 293	63 838
154	Senegal	0.000	–	–
155	Serbia	0.000	–	–
156	Seychelles	0.000	–	–
157	Sierra Leone	0.000	–	–
158	Singapore	0.445	24 688	24 900
159	Slovakia	0.159	8 837	8 913
160	Slovenia	0.000	–	–
161	Solomon Islands	0.000	–	–
162	Somalia	0.000	–	–
163	South Africa	0.362	20 104	20 277
164	South Sudan	0.000	–	–
165	Spain	2.433	134 926	136 088

	Party	*Adjusted United Nations scale with 22 per cent maximum assessment rate considered*	*2018 contributions by parties*	*2019 contributions by parties*
166	Sri Lanka	0.000	–	–
167	Sudan	0.000	–	–
168	Suriname	0.000	–	–
169	Swaziland	0.000	–	–
170	Sweden	0.952	52 800	53 254
171	Switzerland	1.135	62 962	63 504
172	Syrian Arab Republic	0.000	–	–
173	Tajikistan	0.000	–	–
174	Thailand	0.290	16 072	16 210
175	The former Yugoslav Republic of Macedonia	0.000	–	–
176	Timor-Leste	0.000	–	–
177	Togo	0.000	–	–
178	Tonga	0.000	–	–
179	Trinidad and Tobago	0.000	–	–
180	Tunisia	0.000	–	–
181	Turkey	1.014	56 224	56 708
182	Turkmenistan	0.000	–	–
183	Tuvalu	0.000	–	–
184	Uganda	0.000	–	–
185	Ukraine	0.103	5 689	5 738
186	United Arab Emirates	0.601	33 359	33 646
187	United Kingdom of Great Britain and Northern Ireland	4.444	246 490	248 612
188	United Republic of Tanzania	0.000	–	–
189	United States of America	21.906	1 215 054	1 225 514
190	Uruguay	0.000	–	–
191	Uzbekistan	0.000	–	–
192	Vanuatu	0.000	–	–
193	Venezuela (Bolivarian Republic of)	0.569	31 536	31 808
194	Viet Nam	0.000	–	–
195	Yemen	0.000	–	–
196	Zambia	0.000	–	–
197	Zimbabwe	0.000	–	–
	Total	**100.000**	**5 546 722**	**5 594 470**

Annex VI

Summaries of presentations by members of the assessment panels and technical options committees

A. Presentation by the Methyl Bromide Technical Options Committee on final recommendations for critical-use exemptions for 2017 and 2018

1. On behalf of the Technology and Economic Assessment Panel, the Co-Chairs of the Methyl Bromide Technical Options Committee, Mohammed Besri, Ian Porter and Marta Pizano presented an overview of the trends and outcomes for critical use nominations submitted in 2017 for use in 2018 and 2019.

2. In opening the presentation, Mr. Besri reported that parties nominating critical use exemptions are requested under decision Ex.I/4, adopted at the First Extraordinary Meeting of the Parties to the Montreal Protocol of Substances that Deplete the Ozone Layer, held in Montreal from 24 to 26 March 2004, to submit information on stocks. The quantities of methyl bromide "on hand" at the end of 2016 were presented. He said that the Methyl Bromide Technical Options Committee had not reduced its recommended amount of methyl bromide in consideration of stocks held by the party. He added that information on stocks has been reported by some countries but not by others.

3. He then said that since 2005 there had been a progressive downward trend in the officially reported amounts of methyl bromide requested for critical use nominations by all parties for use on soils, structures and commodities. He presented reduction trends in amounts approved/nominated by parties for critical use from 2005 to 2018 for all applications.

4. Mr. Besri reported that quantities of methyl bromide nominated by Argentina for tomato and strawberry production had decreased from 2015 to 2018. The same trends had been observed for China (ginger in protected and open field production) and South Africa (mills and houses). He added that Mexico had not presented any critical-use nomination since 2016 due to the use of methyl bromide stocks. He showed that the total amount of methyl bromide requested in critical-use nominations from all parties had decreased by 33 per cent between 2015 and 2018, from about 450 t to about 300 t.

5. Mr. Porter then provided an overview of the outcomes from the assessment of critical-use nominations submitted in 2017. He stated that five countries still applied for 297.9 t of methyl bromide under critical use in eight sectors. Final recommendations for Argentina (tomato 47.7 t; strawberry fruit 29.0 t), China (ginger open field 16.88 t; ginger protected 18.36 t) and South Africa (mills 2.9 t; houses 42.75 t) had not changed from those recommended at the thirty-ninth meeting of the Open-ended Working Group, however those from Australia and Canada had been reassessed after further information had been provided by the parties after the thirty-ninth meeting.

6. For Australian strawberry runners in 2019, the full amount of 28.98 t was recommended. Although the nomination aligned with decision IX/6, the Methyl Bromide Technical Options Committee continued to encourage the party to review regulations and other hurdles that constrained the adoption of alternatives. This would ensure that together with research and development presently under way a successful phaseout plan could be implemented.

7. For Canadian strawberry runners in 2018, the Methyl Bromide Technical Options Committee recommended the full amount of 5.261 t; however, there were continued concerns about chloropicrin (Pic) being able to be used in methyl bromide/Pic mixtures, but not when it was applied alone.

8. Both nominations from Argentina (strawberry fruit 45.3 t; tomatoes 75.4 t) were reduced to meet the standard presumptions for methyl bromide dosage rates used with barrier films over a three-year adoption period. A further 10 per cent reduction was made for uptake of available alternatives. For the strawberry nomination, the party was urged to consider practices that improve the likelihood of adoption of available alternatives (i.e., 1,3-D/Pic) and for the tomato nomination the Methyl Bromide Technical Options Committee did not accept an increase in the nominated amount from the critical use exemption approved last year.

9. For the nomination from China for open field ginger of 74.617 t, the interim recommendation was reduced for use of a rate that met the standard presumptions for use with barrier films.

10. Mr. Porter finalized the presentation by summarizing issues and the work plan for future critical-use nomination requests. He stated that the Methyl Bromide Technical Options Committee was aware of uses of methyl bromide for which no critical-use nomination was being sought. Also, the

Methyl Bromide Technical Options Committee felt that continued methyl bromide supply for critical-use nominations was in itself becoming a barrier to technological change and consideration of alternatives.

11. China had indicated its intention for 2017 to be the last year of critical-use nominations.

12. In closing the presentation, Mr. Porter stressed that any nominations submitted in 2018 must be submitted to the Methyl Bromide Technical Options Committee by 24 January 2018.

B. Supplemental report of the Technology and Economic Assessment Panel replenishment task force

13. The Co-Chairs of the Technology and Economic Assessment Panel replenishment task force on the funding requirement for the replenishment for the triennium 2018–2020, Lambert Kuijpers, Bella Maranion and Shiqiu Zhang, gave a presentation in plenary on the supplemental report of the task force, which further assessed a number of parameters in the funding requirement for the replenishment of the Multilateral Fund for 2018–2020.

14. Ms. Zhang, Co-Chair of the task force, started the presentation with a description of the mandate given by decision XXVIII/5, which requested the Technology and Economic Assessment Panel to prepare a report to enable parties to decide on the appropriate level of the replenishment of the Multilateral Fund for the triennium 2018–2020. She then described the requests elaborated by the contact group that was set up during the thirty-ninth meeting of the Open-ended Working Group, which required the Technology and Economic Assessment Panel to elaborate on specific groups of elements in a supplementary report for the Twenty-Ninth Meeting of the Parties.

15. She noted that the requests from the thirty-ninth meeting of the Open-ended Working Group had been grouped and then responded by the replenishment task force study, including the elaboration on paragraph 3 of the terms of reference as expressed in decision XXVIII/5 on indicative figures for any additional resources that would be needed to further encourage the use of low-global-warming-potential (GWP) or zero-GWP alternatives; the cost effectiveness figures in tonnes, ODP-tonnes and CO_2 equivalent; the distinction between costs associated with activities related to hydrochlorofluorocarbons (HCFC) and hydrofluorocarbons (HFC); the scenario comparing previously approved projects with business plan estimates on an annual basis in relation to determining uncertainty for planned activities; and the recent Executive Committee decisions.

16. Mr. Kuijpers then continued with the presentation. Regarding the adjustment of the plan to approve funding, Mr. Kuijpers noted that for the period 2005–2016, the average percentage of funding for the total of approvals was 83.2 per cent of the funding for the total of the planned activities from the business plan. The average funding agreed by the Executive Committee for each activity was therefore on average 16.8 per cent lower than funding estimated in the business plan. By taking the differences between planned and approved funding for the years 2005 through 2016, the calculated uncertainty range was on average +/- 13.5 per cent. Using that uncertainty value, the total funding for HCFC phase-out management plan (HPMP) activities was, in principle, approved at a value in the range of about 70 to 97 per cent of the funding estimated for planned activities. When taking into account the impact of approvals of the seventy-ninth meeting of the Executive Committee on (the adjusted) planned HPMP activities, the funding was reduced from $97.1 million to $74.1 million for the triennium 2018–2020 for non-low-volume-consuming countries; and the funding was reduced by $0.23 million since that amount was moved to the approved funding amount for 2017 for low-volume-consuming countries. The approved HPMP activities implied that the funding requirement increased from $289.4 million to $296.2 million for non-low-volume-consuming countries; there was no change for low-volume-consuming countries because some planned funding became approved funding for 2017, which was outside the triennium 2018–2020. Mr. Kuijpers concluded that as a result of the decisions from the seventy-ninth meeting of the Executive Committee, based on the adjusted planned activities, the total funding requirement for HPMPs (excluding any HPMPs stage III) had decreased by $12.5 million, from $388.4 million to $375.9 million (for the triennium 2018–2020).

17. He noted an estimated $0–$10 million for additional HPMP demonstration projects and $13.5 million to $20.2 million for HFC enabling activities (including demonstration projects) may be needed for additional resources to further encourage the use of low-GWP or zero-GWP alternatives. Deferring HPMP stage III activities to the triennium 2021–2023 would reduce the funding requirement presented in the May 2017 report ($0–70.95 million) to zero.

18. Mr. Kuijpers noted that in the May 2017 report, the replenishment task force assumed equal funding tranches for the 14 years for the Chinese HCFC production phase-out management plan (HPPMP) in the period 2017–2030, leading to a funding requirement of $65.62 million

($21.87 million for each of the three years) for the triennium 2018–2020. This assumed a first tranche of $21.87 million in the year 2017. In considering two funding tranches for the Chinese HPPMP in the triennium 2018–2020, the total funding for the next triennium was estimated at $47.15 million or $51.04 million, depending on when the approval decision would be taken and on how the funding tranches would be specified.

19. Mr. Kuijpers further elaborated on the financial implications of a number of changes for the total funding requirement range, starting with the total funding requirement determined in the May 2017 report, the certain activities are subtracted, resulting in a different total funding requirement range, and this was followed by a number of steps or scenarios for HPMP stage II activities, with the average value for HPMP funding and the decrease in comparison to the May 2017 HPMP funding.

20. Ms. Bella Maranion then continued the presentation and presented the cost-effectiveness values of HPMPs (including agency support costs). She mentioned that an average (country-weighted) cost-effectiveness value had been calculated based on the ODP-tonnes approvals for a representative number of non-low-volume-consuming countries (where the approvals usually concerned one, or a mix of two or three HCFCs). This value was $5.18 per kg of ozone-depleting substances (ODS) for non-low-volume-consuming countries when including China, and $5.79 per kg ODS when excluding China. The calculated cost-effectiveness value of a representative sample of low-volume-consuming countries was $9.23 per kg ODS. In climate terms, the cost-effectiveness value was $3.75 t CO_2-eq. for non-low-volume-consuming countries when including China, and $5.05 t CO_2-eq. when excluding China. For a representative sample of low-volume-consuming countries, it was $7.08 t CO_2-eq.

21. Ms. Maranion discussed that the Compliance Assistance Programme funding (including support costs) in the May 2017 report was estimated at $34.8 million for the triennium 2018–2020, based on an annual 3 per cent increase. CAP funding for the triennium 2018–2020 would be $32.8 million with a zero per cent increase per annum, and $36.9 million with a 6 per cent increase per annum, i.e., each 3 per cent increase in CAP funding would add about $2 million to the total funding requirement.

22. She further noted that the replenishment task force took the approach of considering two categories of funding for HFC phase-down enabling activities, i.e., both non-investment activities and investment projects. In the period 2018–2020, the primary funding for enabling activities for non-investment projects would be project preparation, including preparation of proposals for potential demonstration projects, at an amount of $13.5 million to $20.2 million for non-investment activities, and at $8.0 million to 24.0 million for investment projects.

23. Regarding the HFC-23 mitigation, Ms. Maranion said that the Open-ended Working Group at its thirty-ninth meeting had requested the Technology and Economic Assessment Panel replenishment task force to develop a scenario involving the closure of HCFC-22 production plants, with or without existing incineration facilities for mitigating HFC-23 emissions. Funding for the closure of HCFC-22 swing plants was currently not eligible under the HCFC guidelines. Because of lack of guidance and of a decision for compensation by the Executive Committee, the replenishment task force had been unable to develop a scenario.

24. Since the Executive Committee at its eightieth meeting had taken a number of decisions that had consequences for the 2018–2020 funding requirement, Ms. Maranion said that the replenishment task force had assessed the various issues involved. Those decisions increased all total funding requirement values for the scenarios in the supplement report by $53.48 million, owing to (1) the HPPMP of China, with three tranches in 2018–2020 implying an increase of $19.72 million; (2) approved funding tranches: an increase of $35.20 million; less planned funding (now approved): a decrease of $4.30 million; CAP funding 2018–2020: a decrease of $0.89 million; Institutional Strengthening funding planned for 2018–2020, an increase of $3.75 million.

C. Report by the Technology and Economic Assessment Panel on information submitted by parties on energy efficiency opportunities in the refrigeration and air-conditioning sector

25. At the preparatory level of the Twenty-Ninth Meeting of the Parties, Roberto Peixoto and Ashley Woodcock, Co-Chairs of the Technology and Economic Assessment Panel Working Group presented the Technology and Economic Assessment Panel Decision XXVIII/3 Working Group Report on Energy Efficiency. Mr. Peixoto began the presentation by reviewing the decision that requested the Technology and Economic Assessment Panel to review energy efficiency opportunities in the refrigeration, air-conditioning and heat-pump (RACHP) sectors related to a transition to climate-friendly alternatives, including not-in-kind options; invited parties to submit to the Ozone Secretariat by May 2017, on a voluntary basis, relevant information on energy efficiency innovations

in the RACHP sectors; and requested the Technology and Economic Assessment Panel to assess the information submitted by parties and to report thereon to the Twenty-Ninth Meeting of the Parties. He noted that energy efficiency was a broad topic of major importance with an enormous amount of published literature and information. The working group had identified many relevant, current publications from organizations working on energy efficiency improvements and related topics over many years. The working group had also considered recent Montreal Protocol reports, presentations and submissions from parties. As requested in the decision, Mr. Peixoto explained that the report focused on the specific request of the decision on "energy efficiency opportunities in the RACHP sectors related to a transition to climate-friendly alternatives, including not-in-kind options" and considered the following categories of energy efficiency opportunities: technology opportunities; policy, regulatory and information opportunities; and financial and related incentives.

26. He noted that as requested by the decision, 19 submissions (including from the European Union and the African Group) had been received. They were of varied scope, and some provided very comprehensive information, including on the development and implementation of national regulations and policies that encouraged or enforced the use of energy efficient equipment; use of utility incentives for promoting efficient energy use as well as the use of energy efficient equipment; other financial incentives to support consumer appliance purchases; support for research and development on system and equipment design; and many examples of projects and case studies on the installation of energy efficient equipment. The Technology and Economic Assessment Panel had incorporated that information into the report.

27. Mr. Peixoto indicated that the global refrigeration and air-conditioning equipment installed base included 1.5 billion domestic refrigerators (170 million produced annually), 600 million air conditioners (100 million produced annually) and 700 million mobile air-conditioning systems (70 million produced annually). The demand for RACHP equipment was increasing worldwide, particularly in parties operating under paragraph 1 of Article 5 parties owing to factors such as population growth, urbanization, increasing domestic, commercial and automobile air-conditioning use, and for the "cold chain" (bringing food from farm to market). RACHP equipment consumed 17 per cent of electricity worldwide; cities in the tropics reached more than 60 per cent of power generation in the mid-afternoon. The global warming impact of RACHP equipment included 80 per cent indirect impact from electricity use and 20 per cent direct impact from the release of refrigerants (especially with old equipment with high-GWP refrigerants). Options to reduce greenhouse gas emissions included transitioning to low-GWP refrigerants; reducing energy consumption; increasing energy efficiency; reducing cooling load; and improving maintenance.

28. Mr. Peixoto discussed some common terms used including "energy efficiency ratio" and "coefficient of performance", which were used interchangeably; "seasonal energy efficiency ratio"; and "star ratings". Compared to theoretical maximum efficiency, current RACHP equipment were at 30 to 60 per cent and future technology developments could achieve 70 to 80 per cent; however, going further had proved to be prohibitively expensive. The energy efficiency opportunities in the RACHP sectors included technology opportunities that Mr. Peixoto outlined. He discussed that with regard to refrigerants, small improvements in energy efficiency were possible where there are no changes in design and the options for alternative refrigerants were limited to current classes of chemicals or new blends of those chemicals. Large improvements in energy efficiency for new equipment were possible with better control systems and improved components, many of which were already available and just required application and could help reduce leakage from new equipment. There was an opportunity for energy efficiency improvements in new equipment designs concurrent with the transition to low-GWP refrigerants. He noted some specific technology examples, the most likely for broad adoption being those with improved control and monitoring of systems and variable speed compressors. Mature not-in-kind cooling technologies occupy small niches of the market (e.g. absorption technologies, thermoelectric refrigeration and air cycle). Magnetic refrigeration for the domestic sector held promise, but the impact on energy efficiency was uncertain. There were examples of district cooling using absorption chillers, cogeneration and trigeneration plants.

29. Mr. Ashley Woodcock then presented information on policy, regulation and information opportunities, including minimum energy performance standards (MEPS); labelling to help raise consumer awareness; building codes for improved energy efficiency; good practice guidelines for training, maintenance and operation of RACHP to maintain high energy efficiency performance and reduce refrigerant leakage; market mechanisms (e.g., buyers' club, Government bulk procurement); and legislation for energy savings and energy efficiency by utility and energy distribution companies. With regard to MEPS, they limited the maximum energy consumption of equipment and could be combined with labelling schemes and work to remove products with poor energy efficiency from the market. These benefitted from political and stakeholder commitment and could evolve with innovation as energy efficiency improved. There were opportunities to strengthen MEPS in parties operating

under paragraph 1 of Article 5; many parties operating under paragraph 1 of Article 5 did not have MEPS for RACHP in place, or where MEPS were in place they may be set at a lower standard. RACHP equipment had lower energy efficiency in parties operating under paragraph 1 of Article 5, so the adoption of strengthened MEPS could drive improved energy efficiency of equipment, which could in turn enable higher MEPS. Access to accredited laboratories was important for effective enforcement of MEPS.

30. Mr. Woodcock noted the key messages conveyed by the report: that increased energy efficiency had been an important side benefit of the Montreal Protocol through two previous transitions of refrigerants over 30 years; demand for RACHP equipment was increasing rapidly especially in parties operating under paragraph 1 of Article 5 where RACHP already consumed ~1/6th of the world's electricity; there were many opportunities to achieve improvements in energy efficiency during the transition to low-GWP refrigerants. A coordinated domestic transition to low-GWP refrigerants could include a parallel effort on improving energy efficiency of RACHP equipment.

D. Presentations during the high-level segment by members of the assessment panels on progress in the work of the panels

1. Scientific Assessment Panel

31. John Pyle, Paul A. Newman, David W. Fahey and Bonfils Safari, Co-Chairs of the Scientific Assessment Panel, gave a presentation on the 2018 World Meteorological Organization/United Nations Environment Programme Scientific Assessment of Ozone Depletion. The Montreal Protocol required that the Scientific Assessment Panel provide the latest information on the state of the ozone layer, the stratosphere and ODS such as chlorofluorocarbons at least every four years. The presentation included a basic update on the progress of the 2018 assessment with a few scientific highlights.

32. The Scientific Assessment Panel presented basic information on the structure of the 2018 assessment. First, the assessment was composed of six chapters on ozone-depleting substances; hydrofluorocarbons; global stratospheric ozone: past, present and future; polar stratospheric ozone: past, present and future; stratospheric ozone changes and climate; and scenarios and information for policymakers.

33. As of November 2017, the first draft of the assessment was complete, had undergone a first peer review with over 5,000 individual comments and was under revision. The completed assessment will be delivered in December 2018 along with an executive summary and an updated "Twenty Questions and Answers About the Ozone Layer".

34. The assessment would include updated information that had been requested by the parties. In particular, updated HCFC GWP were requested under the Kigali Amendment. The GWP for the HCFCs with missing values in Annex C had been calculated by Dimitrios Papanastasiou, Paul Marshall and James Burkholder of the National Oceanic and Atmospheric Administration of the United States of America and were included in a manuscript being peer reviewed for publication. The comprehensive evaluation of HCFCs, including 274 isomers and stable conformers, would be included in the 2018 assessment.

35. The Scientific Assessment Panel had also discussed halogenated very short-lived substances (VSLS) that are ozone-depleting substances. Previous assessments had discussed natural and anthropogenic VSLS - ODS with lifetimes of less than about 6 months. Recent studies had focused on chlorinated VSLS, including CH2Cl2 (dichloromethane, DCM) with a lifetime of about 140 days, and CH2ClCH2Cl (1,2-dichloroethane, DCE) with a lifetime of about 65 days. The Panel had estimated that VSLS comprised up to ~ 3.3 per cent of lower stratospheric chlorine, with up to 1.8 per cent from DCM and up to 0.6 per cent from DCE. Those estimates had high uncertainty because of sparse stratospheric observations and variability in VSLS sources. Tropospheric VSLS chlorine concentrations had increased from ~85ppt in 2008 to ~110ppt in 2016. The largest VSLS increases had occurred for DCM, but as noted above, the contribution to total stratospheric chlorine was small. Understanding the role of VSLS emissions in long-term future stratospheric ozone changes remained an open science question.

36. Total ozone in both polar regions continued to remain below levels observed in the 1970s. Spring Arctic ozone remained below the long-term average, with large depletions occurring every few years (e.g., 2011). Antarctic ozone in October also remained well below the long-term average, but there was recent evidence that ozone levels were increasing. The 2017 Antarctic ozone hole was much weaker than average. However, this small 2017 hole was mainly due to unusual meteorological conditions observed in September 2017.

37. Finally, the Scientific Assessment Panel showed information on projected levels of hydrofluorocarbons (HFCs) through the 21st century. The Kigali Amendment control of HFC production and consumption was projected to limit future surface warming from HFCs to less than 0.1C in 2100.

2. Environmental Effects Panel

38. Janet Bornman and Nigel Paul, Co-Chairs of the Environmental Effects Assessment Panel, presented the annual update and progress towards the quadrennial assessment for 2018. They stressed the importance and complexity of interactions between the effects of changes in stratospheric ozone and ultraviolet (UV) radiation, and the effects of climate change.

39. Ms. Bornman highlighted the important role of the Montreal Protocol in preventing large increases in skin cancers and cataract by UV radiation. However, several types of skin cancers were continuing to increase globally, with a substantial health burden and cost. These increases varied widely with skin type, ethnicity and behavioural response to sun exposure. Those behavioural choices may be influenced by climate change.

40. Apart from the adverse effects of UV-B radiation (280–315 nm), the beneficial effects of the radiation on human health also needed to be considered because of expected changes from recovery of the stratospheric ozone as well as from climate, which would likely result in variations in UV radiation. Recent evidence suggested that low doses of solar UV radiation increases vitamin D without accumulating DNA damage, which would be a useful behavioural pattern to improve vitamin D status while minimizing the damaging effects of UV-B radiation on health.

41. Apart from the focus on the effects from exposure to UV-B radiation, recent studies on ecosystems in the southern hemisphere were showing that the large ozone-driven changes in climate were increasing precipitation in some areas while causing drought and high temperatures in other areas. These changes have both positive consequences, such as increased plant growth, improved animal survival, and negative consequences, such as fires.

42. Co-Chair Nigel Paul went on to further highlight and assess some of the modifying influences of UV radiation and the interactive effects of climate change on ecosystems and materials. For example, stress tolerance and the timing of crop ripening were altered by warmer temperatures and droughts that coincided with seasonal maxima in UV-B radiation. Increased exposure to UV radiation could also change food crop quality, with positive or adverse outcomes for nutrition.

43. UV radiation caused degradation of breakdown of dead plant material in dryland ecosystems, contributing to carbon dioxide emissions. At high latitudes, permafrost soils became exposed to solar radiation, which enhanced emissions of methane and carbon dioxide. Also at high latitudes, increased run-off from the land increased the amount of coloured organic matter entering aquatic ecosystems. This may protect aquatic organisms from UV radiation damage, but since the radiation also broke down these materials, carbon dioxide emissions were enhanced.

44. It was noted that concentrations of trifluoroacetic acid (TFA), a breakdown product of some HFCs, and heavy fuel oils continued to be substantially below those that were considered a health or environmental risk. However, a wide range of commercially manufactured chemicals, such as some pharmaceuticals and pesticides, degraded to produce TFA, making continued monitoring of TFA advisable.

45. Research stimulated by the Montreal Protocol had greatly advanced understanding of the diverse effects of UV radiation in the environment. An example was the degrading effect of UV radiation on plastics. On exposure to solar UV radiation, the surface layer of many plastics broke down to release plastic fragments (microplastics) into the environment, which had resulted in contamination of microplastics in fish and seafood and the foodweb in general.

46. Co-Chair Nigel Paul wrapped up the Environmental Effects Assessment Panel update by presenting the work schedule leading up to the completion of the Quadrennial Report by the end of November 2018.

3. Technology and Economic Assessment Panel

47. At the high-level segment of the Twenty-Ninth Meeting of the Parties, Co-Chairs Marta Pizano and Bella Maranion made a presentation on behalf of the Technology and Economic Assessment Panel. Ms. Pizano noted that the role of the Panel as defined in Article 6 of the Montreal Protocol was to assess every four years the control measures on the basis of available scientific, environmental, technical and economic information. Under the terms of reference of the Technology and Economic Assessment Panel regarding its scope of work, the Panel analysed and presented

technical information and recommendations when specifically requested; it did not evaluate policy issues and did not recommend policy; it presented technical and economic information relevant to policy; it did not judge the merit or success of national plans, strategies or regulations; and its members functioned on a personal basis as experts and did not accept any instruction from Governments or other organizations. Over the past 30 years, the Panel had produced over 300 progress, assessment, task force and other reports. The Panel and its technical options committees currently brought together nearly 150 experts from over 30 countries. Since its creation in 1989, more than 900 experts from about 65 countries had participated in the assessment process.

48. Ms. Pizano moved to the next part of the presentation on sector achievements and issues of interest to parties, starting with the foams sector, which produced approximately 30 million tonnes of foams per year, critical for insulation. Over one-third of HCFC blowing agents had converted to alternatives. Hydrocarbons had been widely implemented globally with substantial co-benefits in terms of climate change. Foams made with zero-ODP alternatives had improved insulation performance by 5 to 10 per cent; additional gains in insulation performance of 5 to 10 per cent were expected with heavy fuel oils/blends. HFO blends with water, hydrocarbons and oxygenated hydrocarbons (e.g., methyl formate and methylal) were increasingly available.

49. She noted the success of the halon sector. Thirty years ago, annual worldwide halon production was approximately 40,000 t (approximately 225,000 ODP t) and growing. Since 2010, worldwide production had ceased, and this had avoided in excess of 1,000,000 t halon production or 6,700,000 ODP t or 3,500,000,000 t CO_2-eq. Halons alternatives were available for all new fire protection designs, except for aircraft cargo bays. The International Civil Aviation Organization (ICAO) had recently mandated 2024 as the date by which new designs could no longer use halons. All civil aviation applications now had dates for which new designs could no longer use halons. These achievements had been made possible only through more than a decade of personal engagement between the Montreal Protocol and ICAO. She noted with appreciation and honour the attendance of the Acting Secretary-General of ICAO, Ivan Galan, at the Montreal Protocol 30th Anniversary Awards Ceremony and his acceptance on behalf of ICAO of the Policy and Implementation Leadership Award.

50. Ms. Pizano stated that as the halon sector transition moved forward, many designs continued to need high-GWP HFCs and some limited applications still required HCFCs. New low-GWP fire suppressants were only in the very early stages of development, and the outlook was unclear. Halons would continue to be needed for the life of existing equipment and current aviation designs (excluding those with European Union retrofit requirements). While banked halons continued to supply needs for all current halon requirements, there was still concern that there would not be adequate long-term halon supplies. She noted that continued coordination with ICAO would be critical to the further success of the sector.

51. Ms. Maranion then continued the presentation with regard to the medical and aerosols sector, noting that the global transition away from CFC metered-dose inhalers was almost complete, after 30 years of global action, with more than 98 per cent reduction in global CFC use. CFC-11 and CFC-12 production had ceased. CFC metered-dose inhalers were only being manufactured in China and the Russian Federation from CFC stockpiles while the transition to alternatives continued. Affordable CFC-free alternatives to metered-dose inhalers were available worldwide. The global use of HCFCs in aerosols and sterilants was relatively very small (a few thousand tonnes), with alternatives available.

52. With regard to chemical uses, she noted that the global phase-out of CFCs used as solvents in aerospace applications was almost complete. CFC-113 production for this use had ceased; the Russian Federation continued to use CFC-113 from a small remaining stockpile, and recovery and recycling. ODS quantities used for process agents had decreased, with some applications phased out entirely, such as production of chlorinated polypropene, chlorinated ethylene vinyl acetate and methyl isocyanate derivatives. Laboratory and analytical uses of ODS continued under the global exemption, and with one essential-use exemption. There was an overall upward trend in global ODS production for feedstock uses for the last decade. The Technology and Economic Assessment Panel was collaborating with the Scientific Assessment Panel and other experts to share information on global carbon tetrachloride emissions estimations, and the Technology and Economic Assessment Panel would report on dichloromethane and dichloroethane in its 2018 assessment report.

53. Ms. Maranion then noted the successes and continuing challenges in the methyl bromide sector. Article 7 data reporting indicated that 99 per cent (approximately 65,000 t) of methyl bromide had been phased out globally. This had broadly contributed to an increased adoption of sustainable production practices in agriculture. A total of 28 countries had phased out methyl bromide for all uses including quarantine and pre-shipment (QPS). Approximately 18,000 t of methyl bromide was

produced and used for other uses (QPS, feedstock, critical uses, unreported use). QPS uses were currently reported by 68 Parties. Reduction of remaining QPS use would benefit ozone layer protection and still facilitate international trade. On other continuing challenges, she noted that some parties continue to report difficulties distinguishing between controlled and exempted uses; concerns existed about non-compliant and unreported uses; better tracking systems were needed to avoid QPS methyl bromide being used in controlled applications; and some parties had improved their reporting under Article 7, but concerns on accurate reporting still remained. The Scientific Assessment Panel and the Methyl Bromide Technical Options Committee were working together to further clarify the relationship between methyl bromide consumption and its atmospheric concentration.

54. Ms. Maranion then presented on the refrigeration, air-conditioning and heat pumps (RACHP) sector, noting that the use of CFCs in new RACHP equipment had ceased. In parties not operating under paragraph 1 of Article 5, the HCFC phase-out was almost complete; in parties operating under paragraph 1 of Article 5, HCFC-22 consumption in RACHP was decreasing and HCFCs would soon be used in RACHP servicing only. Low-GWP solutions were becoming increasingly available for many RACHP applications. Results of many tests of HCFC and high-GWP HFC alternatives under high ambient temperature conditions were available. She noted that RACHP technology was rapidly evolving and that an integrated approach was needed for low-GWP solutions that also took into account energy efficiency, flammability and toxicity.

55. Continuing the 2018 assessment reports, she referred to the terms of reference established by parties in decision XXVII/6. Based on the terms of reference, the Technology and Economic Assessment Panel through its technical options committees had initiated work on the assessment report, including planning for peer review for certain reports. The 2018 meetings of the technical options committees, most of which would be taking place in March, would include a focus on the assessment reports. The final technical options committee assessment reports would be submitted by the end of 2018. The assessment report of the Technology and Economic Assessment Panel would be presented to the Open-ended Working Group in 2019, and the synthesis report of the three panels would be presented to the Meeting of the Parties in 2019.

56. Ms. Maranion noted that going forward, the Technology and Economic Assessment Panel composed its technical options committees and temporary subsidiary bodies to maintain a balance of expertise to provide comprehensive, objective and policy neutral reports. The Panel provided a list of needed expertise that was updated annually and posted on the Secretariat website. The Technology and Economic Assessment Panel and technical options committees strove to achieve gender balance, balance between parties operating under paragraph 1 of Article 5 and those not so operating and geographical balance. She reiterated that the Panel remained ready to respond to tasks from parties, continued to identify emerging issues and sought to be aligned with the current and future needs of the parties, with access to appropriate expertise. She expressed appreciation for continued consideration by parties of the tasks that came to the Panel, of the overall workload and the timeline needed to produce quality outcomes that met the needs of the parties.

57. Ms. Maranion concluded by noting that in looking forward, it was also important to look back, especially on the occasion of the thirtieth anniversary of the Montreal Protocol, to recognize those that had been instrumental to the legacy of the Assessment Panel's contributions to the success of the Montreal Protocol. She noted that a presenter at the previous night's awards ceremony used the phrase "standing on the shoulder of giants" by Sir Isaac Newton. She stated that the original phrase by John of Salisbury was longer and went as follows: "We are like dwarfs sitting on the shoulders of giants. We see more, and things that are more distant, than they did, not because our sight is superior or because we are taller than they, but because they raise us up, and by their great stature add to ours." She recognized those "giants" to the legacy of the Assessment Panel under the Montreal Protocol: the vision for the Panel by then-UNEP Executive Director Mostafa Tolba; the original Co-Chairs of the Panel, Vic Buxton (Canada) and Stephen Andersen (United States of America); and the other preceding Co-Chairs of the Panel, Steve Lee-Bapty (United Kingdom), Lambert Kuijpers (Netherlands), Suely Carvalho (Brazil) and Jose Pons (Bolivarian Republic of Venezuela). She also extended appreciation to the past members of the Panel and technical options committees for their commitment and contributions to the Protocol and she recognized the unfailing support extended to the Panel by the offices of the Ozone and Multilateral Fund secretariats.