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Summary of the 47th meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer: 7–11 July 2025

The Montreal Protocol on Substances that Deplete the Ozone Layer has successfully addressed threats to the Earth's protective ozone layer, from chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and other synthetic ozone-depleting substances (ODS), for nearly 40 years. Today, the Protocol not only provides a clear phase-out schedule for ODS, but with the adoption of the Kigali Amendment in 2016, it has also set a phase-down schedule for hydrofluorocarbons (HFCs), a group of synthetic gases that were developed to replace ODS, but are powerful greenhouse gases. While the fruits of concerted efforts to curb ozone-depleting substances and HFCs are paying off, much remains to be done to ensure the continued success of the Protocol and its parent treaty, the Vienna Convention for the Protection of the Ozone Layer.

Scientific assessments underpin the actions of parties, enabling them to respond to new and emerging challenges to the health of the ozone layer. At the 47th meeting of the Open-ended Working Group (OEWG 47), delegates benefited from the work of the Protocol's Technology and Economic Assessment Panel (TEAP). Its latest report informed discussions on the items under consideration at this meeting, with delegates relying on the experts of the Panel and its Technical Options Committees (TOCs) to make progress on the negotiation of draft decisions and other issues that will be further discussed at the 37th Meeting of the Parties to the Protocol (MOP 37) in November 2025.

The OEWG 47 agenda addressed a range of issues, including:

- terms of reference for the study on the next replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol (MLF);
- options for the organization of the TEAP and its TOCs;
- life-cycle refrigerant management;
- metered-dose inhalers with low global-warming-potential propellants;
- halon 1301 and other controlled substances used for fire suppression;
- feedstock uses of controlled substances;
- enhancing regional atmospheric monitoring of controlled substances;
- further strengthening Montreal Protocol institutions;
- review of the need for the annual average of 2.5% of the baseline for HCFC to be used for servicing and non-servicing applications for Article 5 (developing countries) during the period 2030–2040; and
- national and regional initiatives to support the implementation of the Kigali Amendment.

Delegates engaged in a collegial manner to address these challenging issues. They also reopened discussions on some longer-standing issues, such as the classification of the State of Palestine as a developing country party under the Montreal Protocol and access to support from the MLF.

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OEWG 47 convened in Bangkok, Thailand, from 7–11 July 2025, with over 500 registered participants representing governments, academia, industry, and civil society.

A Brief History of the Ozone Regime

Concerns that the Earth's stratospheric ozone layer could be at risk from CFCs and other anthropogenic substances first arose in the early 1970s. At that time, scientists warned that releasing these substances into the atmosphere could deplete the ozone layer, hindering its ability to prevent harmful ultraviolet (UV) rays from reaching the Earth. This would adversely affect ocean ecosystems, agricultural productivity, and animal populations, and harm humans through higher rates of skin cancers, cataracts, and weakened immune systems. In response, a UN Environment Programme (UNEP) conference held in March 1977 adopted a World Plan of Action on the Ozone Layer and established a Coordinating Committee to guide future international action.

Vienna Convention: Negotiations on an international agreement to protect the ozone layer were launched in 1981 under the auspices of UNEP. In March 1985, the Vienna Convention for the Protection of the Ozone Layer was adopted. It calls for cooperation on monitoring, research, and data exchange, but does not impose obligations to reduce the use of ODS. The Convention has 198 parties, which represents universal ratification.

Montreal Protocol: In September 1987, efforts to negotiate binding obligations to reduce ODS usage led to the adoption of the Montreal Protocol, which entered into force in January 1989. The Montreal Protocol introduced control measures for some CFCs and halons for developed countries (known as non-Article 5 parties). Developing countries (Article 5 parties) were granted a grace period, allowing them to increase their ODS use before taking on commitments. The Protocol has 198 parties.

Since 1987, several amendments and adjustments have been adopted, adding new obligations and additional ODS and adjusting existing control schedules. Amendments require ratification by a certain number of parties before they enter into force; adjustments enter into force automatically. All amendments except the newest, the Kigali Amendment, have been ratified by 197 parties.

Key Turning Points

London Amendment and Adjustments: At the second MOP, held in London, UK, in 1990, delegates tightened control schedules and added ten more CFCs to the list of ODS, as well as carbon tetrachloride (CTC) and methyl chloroform. MOP 2 also established the MLF, which meets the incremental costs incurred by Article 5 parties in implementing the Protocol's control measures and finances clearinghouse functions. The Fund is replenished every three years.

Copenhagen Amendment and Adjustments: At MOP 4, held in Copenhagen, Denmark, in 1992, delegates tightened existing control schedules and added controls on methyl bromide, hydrobromofluorocarbons, and HCFCs. MOP 4 also agreed to enact non-compliance procedures. It established an Implementation Committee to examine possible non-compliance and make recommendations to the MOP aimed at securing full compliance.

Montreal Amendment and Adjustments: At MOP 9, held in Montreal, Canada, in 1997, delegates agreed to a new licensing system for importing and exporting ODS, in addition to tightening existing control schedules. It also banned trade in methyl bromide with non-parties to the Copenhagen Amendment.

Beijing Amendment and Adjustments: At MOP 11, held in Beijing, China, in 1999, delegates agreed to controls on bromochloromethane, additional controls on HCFCs, and reporting on methyl bromide for quarantine and pre-shipment (QPS) applications.

Kigali Amendment: At MOP 28, held in Kigali, Rwanda, in 2016, delegates agreed to amend the Protocol to include HFCs as part of its ambit and to set phase-down schedules for HFCs. HFCs are produced as replacements for HCFCs and are therefore a result of ODS phase-out. HFCs are not a threat to the ozone layer but have a high global-warming-potential (GWP). To date, 163 parties to the Montreal Protocol have ratified the Kigali Amendment, which entered into force on 1 January 2019.

Recent Meetings

MOP 34: At this meeting, held in Montreal, Canada from 31 October – 4 November 2022, delegates discussed and adopted decisions related to, among others: illegal import of certain refrigeration, air-conditioning, and heat pump products and equipment; identification of gaps in the global coverage of atmospheric monitoring of controlled substances and options for enhancing such monitoring; collecting data to understand potential impacts of the COVID-19 pandemic on HFC consumption in developing countries; strengthening institutional processes with respect to information on HFC-23 by-product emissions; and strengthening the Protocol's institutions, including for combating illegal trade.

Delegates also adopted the terms of reference for the study on the MLF replenishment for 2024–2026, opening the door for TEAP to establish the Replenishment Task Force (RTF) to prepare for the replenishment negotiations at MOP 35.

OEWG 45: At this meeting, which took place from 2–7 July 2023 in Bangkok, Thailand, delegates delved into the quadrennial reports prepared by the Scientific Assessment Panel (SAP), the Environmental Effects Assessment Panel (EEAP) and TEAP. They also addressed issues, including: illegal import/export of obsolete equipment; stratospheric aerosol injection; adjustments to the Protocol and its Kigali Amendment; emissions of HFC-23; and very short-lived substances (VSLS) with ozone-depleting potential (ODP).

There was an extensive discussion on the report of the TEAP RTF on the replenishment of the MLF for the triennium 2024–2026. The report estimated the replenishment need at approximately USD 1 billion. Delegates requested the Task Force to prepare a supplementary report addressing a list of elements for additional analysis.

MOP 35: At this meeting, which took place from 22–27 October 2023 in Nairobi, Kenya, parties adopted the largest-ever replenishment of the MLF for the implementation of the Protocol, just shy of USD 1 billion. Delegates took decisions on, *inter alia*, life-cycle refrigerant management (LRM); stratospheric aerosol injection; the impacts of the COVID-19 pandemic on HFC baseline consumption for certain parties; energy efficiency; and VSLS. They also took decisions on feedstock uses of methyl bromide; the import and export of prohibited cooling equipment, to address the long-standing issue of dumping; and further strengthening Protocol

institutions, including those concerned with combating illegal trade. They agreed to defer discussion on a potential roadmap to end illegal trade in controlled substances to the next meeting of the Montreal Protocol's OEWG.

OEWG 46: At this meeting, held in Montreal, Canada, from 8–12 July 2024, delegates once more benefited from the work of the Protocol's Assessment Panels, which informed discussions in preparation for COP 13/MOP 36, including on enhancing regional atmospheric monitoring of controlled substances; strengthening the enabling environment of the Montreal Protocol; addressing aspects of illegal trade in controlled substances and unwanted imports of energy inefficient products; feedstock uses of controlled substances; and VSLS. Parties decided against further discussions on additional funding to support countries seriously affected by the COVID-19 pandemic at MOP 36, noting this issue did not have the support of most parties.

COP 13/MOP 36: This combined meeting was held in Bangkok, Thailand, from 28 October – 1 November 2024. Parties took key decisions related to: evaluating the suitability of potential sites to close gaps in the global atmospheric monitoring network; undertaking atmospheric monitoring of HFC-23 and research on sources of HFC-23 emissions to address the gap between global HFC-23 emissions reported by parties and emission estimates derived from measured atmospheric abundances; providing further guidance and information on LRM and to encourage parties to adopt a systemic approach to LRM; requesting the TEAP and SAP to provide updated information on the most abundantly used VSLS; minimizing emissions of controlled substances used as feedstocks; transitioning to metered-dose inhalers (MDIs) with low-GWP propellants; ensuring the sustained availability of halons; and preventing illegal trade in controlled substances through best practices.

OEWG 47 Report

On Monday, 7 July, OEWG Co-Chair Shontelle Wellington (Barbados) opened the meeting and praised the friendship, gratitude, respect, and hospitality of the people of Thailand. Dechen Tsering, Director, UNEP Regional Office of Asia Pacific, commended the Ozone Treaties as the beacon for what science and consensus-based multilateralism can achieve and encouraged parties that have not done so to ratify the Kigali Amendment.

Megumi Seki, Executive Secretary, Ozone Secretariat, honored the contributions of three members the "ozone family" had sadly lost since the last meeting: Janusz Kozakiewicz, Satyendra Kumar Purkayastha, and Xiaoyan Tang. She then highlighted that a documentary celebrating the 40th anniversary of the Vienna Convention had been commissioned with the premiere to be screened at MOP 37. She highlighted the key issues on the OEWG agenda and the work of the Secretariat and the parties against the backdrop of the 27 decisions adopted at COP 13/MOP 36.

Organizational Matters: On Monday, delegates adopted the agenda (UNEP/OzL.Pro.WG.1/47/1, Add.1 and final agenda) with amendments suggested by AUSTRALIA, the EU, the US, EGYPT, RWANDA, and CHINA. These included the addition of matters for consideration under the discussion of the TEAP progress report (TEAP membership changes, halon 1301 in the civil aviation sector and the framework of fire suppressants more generally, VSLS, and per- and polyfluoroalkyl substances (PFAS)), and under Other Matters (regional initiatives in support of the Kigali Amendment). EGYPT suggested, and delegates agreed, to delete consideration of a proposal for a change in the cut-off date for eligible capacity indicated in paragraph 17 of decision XXVIII/2 (HFC phase down). They also agreed to the organization of work as orally proposed by OEWG Co-Chair Annie Gabriel (Australia).

Delegates based most of their considerations on the documents containing issues for discussion by, and information for, the attention of OEWG 47 (UNEP/OzL.Pro.WG.1/47/2 and Add.1). Additional draft decisions were submitted by parties in plenary.

Terms of Reference (ToR) for the Study on the 2027–2029 Replenishment of the MLF

On Monday, OEWG Co-Chair Wellington opened discussions on the possible ToR for a TEAP Task Force to undertake a study as the basis for the consideration of the funding needed for the replenishment of the MLF for the 2027–2029 triennium. In this regard, she drew delegates' attention to the ToR used for the 2024–2026 replenishment and adopted at MOP 34 in decision XXXIV/2. FEDERATED STATES OF MICRONESIA pointed to the need for an increase in spending on Kigali Amendment implementation, calling for the ToR to strengthen implementation institutions and assist countries in transitioning to energy efficient technologies.

The EU noted their priorities including on the impacts of PFAS and the costs and savings of leapfrogging to better alternatives. CANADA called for the study to be straightforward with a simple ToR and announced that they would circulate a conference room paper (CRP) on this issue to serve as a basis for discussions in a contact group. JAPAN and the UK indicated their willingness to co-sponsor the CRP.

NIGERIA, MOZAMBIQUE, CHINA, and INDONESIA underlined the need for the study to consider the resource needs of Article 5 parties, particularly on implementing HCFC Phase-Out Management Plans, as well as issues related to LRM, illegal trade, and the reduction of HFCs.

Highlighting the specific needs of high ambient temperature (HAT) countries, SAUDI ARABIA called for clear ToR that differentiate the capacities of countries in terms of implementation flexibility, and for the inclusion of national capacity-building considerations.

INDIA and CHINA noted the need to consider the needs of small- and medium-sized enterprises in Kigali Amendment implementation.

KUWAIT underlined that the Task Force must take into consideration, among other things, the servicing sector; called for funds for end-of-use processes; and proposed that the study include calculations for early implementation in HAT countries, noting this could require a member from the MLF Secretariat to join the Task Force.

The US stressed that the study should take into account relevant decisions already taken and reiterated the need for estimates to be grounded in reality and transparency. He questioned whether MLF Secretariat members joining the Task Force would be appropriate from an institutional perspective.

NORWAY expressed willingness to work on the basis of a CRP.

GRENADA, supported by BHUTAN, called for special consideration of the challenges faced by least developed countries, with a focus on their servicing sector.

BAHRAIN and QATAR, supported by LEBANON, drew attention to the specific challenges of HAT countries. LEBANON, with LESOTHO, referred to the importance of digitalization as a key factor for data collection, implementation, compliance, and funding.

On Monday afternoon, CANADA introduced their proposal (UNEP/OzL.Pro.WG.1/47/CRP.3) on the ToR for the study on the 2027–2029 MLF replenishment, co-sponsored by Australia, Japan, and the UK.

KUWAIT observed that the common practice is to use the previous ToR as a guide for the present discussion, calling for legal clarity on whether CRP.3 can be used given that it deviates from standard procedure, and preferring the use of the previous ToR decision as a basis for discussions. This was supported by CHINA, INDIA, LEBANON, SAUDI ARABIA, and ARGENTINA.

CANADA noted that for the previous replenishment study, there was no CRP, but reminded delegations that there is usually a CRP submitted for each replenishment study, welcoming any additions to CRP.3. This was supported by the US and the EU.

The Secretariat noted that it had annexed the previous decision for parties to use as a starting point but noted that the submission of a new CRP would not preclude discussions. Responding to KUWAIT, they noted that parties can use the previous decision as a basis for contact group discussions.

Delegates then agreed to establish a contact group, co-chaired by Ralph Brieskorn (the Netherlands) and Miruza Mohamed (Maldives), to consider a bracketed CRP.3 as the basis for discussions.

The contact group met from Tuesday to Thursday. Delegates discussed to what extent elements from the 2024–2026 replenishment study should be reinserted into the CRP. They were particularly interested in the topic of digitalization and what it could mean for the servicing sector. Delegates also discussed what experiences or benchmarks could be used by the TEAP to assess cost estimates for parties' implementation activities, and if and how to reflect earlier decisions as well as party obligations in the ToR.

The group considered whether to include potential scenarios for the TEAP Task Force to consider in their study. They disagreed on whether such scenarios should: prioritize projects in developing country parties that need it most; consider parties with increased ambition; and take actual HFC consumption and reduction of HFC consumption into account. Delegates also disagreed on whether potential scenarios in the study should refer to specific technologies such as "natural refrigerants" and hydrofluoroolefins (HFOs).

In plenary on Friday morning, Co-Chair Mohamed reported that the contact group had been able to review all the CRP paragraphs in a constructive atmosphere, and parties agreed to forward the CRP to MOP 37 for further consideration.

TEAP Presentations and Discussions

On Monday, OEWG Co-Chair Wellington introduced the agenda item on the consideration of TEAP's 2025 Progress Report, also prepared in response to decisions adopted by MOP 36 on LRM (decision XXXVI/2) and MDIs with low-GWP propellants (decision XXXVI/6), and by MOP 35 on options for the organization of TEAP and its TOCs (decision XXXV/20).

The **Flexible and Rigid Foams TOC (FTOC)** noted successful transitions from HCFCs and HFCs for most foam types, highlighting that all previously used HFCs, except HFC-152a, are no longer used in foams in almost all non-Article 5 parties. They noted that the commercial adoption of hydrocarbon (HC) foam blowing agents (FBAs) in Article 5 parties is increasing, with some small- and medium-sized enterprises reportedly adopting HC FBAs without safety precautions.

The FTOC responded to questions from ARGENTINA about supply chain delays, reiterating that most parties have moved away from HFCs, but there is anecdotal evidence that the transition is not fully resolved yet. In response to KENYA's question about challenges in data collection, they said that various types of equipment, including refrigeration, contain foam. They explained that to collect such data, parties need to liaise with the manufacturer. In response to MEXICO's question about challenges in transitioning to low-ODP foam, the FTOC Co-Chairs said different subsectors of the foam industry are having challenges blending FBAs in a way that ensures lower costs and that don't make the product flammable.

The **Fire Suppression TOC (FSTOC)** reported that the International Civil Aviation Organization (ICAO) currently mandates that halon 1301 cannot be used in cargo compartments of new aircraft designs after 2024, but noted that the global civil aviation industry will submit a request to ICAO to extend this date beyond 2024, owing to the significant long-term uncertainty and apprehension caused by potential PFAS regulations applying to alternative fire suppressants. They stressed that, to ensure the long-term halon 1301 supply to meet demand, the civil aviation industry intended to pursue the essential use nomination (EUN) process. The Committee called on parties to consider how to better facilitate the transboundary shipments of recovered halons to address regional imbalances, calling on them to emphasize that recovered halons are not considered hazardous waste under the Basel Convention, and discourage the destruction of halons unless they cannot be economically reclaimed. The FSTOC also responded to questions from the EU, US, CANADA, and IRAN.

The Committee explained that solid aerosol fire suppression systems are used in limited applications in non-occupied spaces, noting concerns in their use in confined spaces, including reports of deaths. They noted that the TOC tracks the destruction of halons in the aviation sector. The Committee shared that currently, halon 1301 will be available for enduring purposes, although there may be regional imbalances in this availability. They noted that it would be difficult to register an essential use exemption (EUE) for halon 1301 as its demand depends on unexpected discharges and leaks. The FSTOC also noted that many countries are trying to transition to 2-BTP fire extinguishers, although it was difficult to measure progress. They also explained that trains are not typically protected with gaseous extinguishers. Delegates agreed to engage in bilateral discussions with the FSTOC.

The **Methyl Bromide TOC (MBTOC)** announced that, for the first time, no submissions for critical use exemptions (CUEs) for methyl bromide were received in 2025. On the continuing use of methyl bromide for QPS, they noted that between 7,000–10,000 tonnes/year are still used, with over 85% vented directly into the atmosphere after treatment and noting that a change to the worker safety exposure limit from 5 ppm to 1 ppm could restrict its use. On methyl bromide emissions, they reported that the atmospheric concentration of methyl bromide has remained at the same level over the past three years due to continuing QPS use, with recent

papers reporting methyl bromide emissions from unknown sources that do not match consumption reported under Article 7 (estimated at 4,000–9,000 tonnes/year from 2011–2020).

The MBTOC responded to questions from NIGERIA and SWITZERLAND, stating that targeted policies are needed for capturing a higher ratio of controlled substances used in QPS treatment of durable and perishable commodities. They also clarified that they would have the expertise, but not the mandate, to provide advice on nitrous oxide as an ODS not controlled by the Protocol.

The **Medical and Chemicals TOC (MCTOC)** highlighted that updated information had been reported on the production and use of controlled substances for feedstocks, noting the proportions of the largest ODS feedstocks include 50% for HCFC-22, 18% for CTC, and 15% for HCFC-142b. They also reported on the increasing trends of controlled substances for feedstock use from 2002–2023. The MCTOC responded to questions from BANGLADESH, CUBA, the US, the EU, and KUWAIT. The Committee indicated that there is potential for companies in both Article 5 and non-Article 5 countries to produce pharmaceutical grade lower-GWP propellants, acknowledging that fire and other safety concerns remain. They further suggested that longer term stockpiling of HFCs designated to be phased down may not be practical given applicable limits on the amount and time of storing propellants for pharmaceutical uses. As to specific measures parties could take to help close data gaps, they referred to plant-specific site data on feedstock emissions derived from local and regional atmospheric monitoring.

The TEAP reported on developments concerning MDIs with low-GWP propellants, noting that asthma and chronic obstructive pulmonary disease (COPD) affect 600 million people and are managed using pressurized MDIs (pMDIs) and dry powder inhalers (DPIs). They shared that current pMDIs utilize pharmaceutical-grade HFC-134a or HFC-227ea as propellants, both of which may be unavailable after 2030. The Panel noted that lower-GWP alternatives (including HFC-152a and HFO-1234ze(E)) for pMDIs are at the research and development stage, and welcomed the fact that having two lower-GWP propellant options reduces the risk to patients of limited inhaler supply. They highlighted that the regulatory requirements for pMDI approval vary in different regions and pointed to the need for additional investment and clinical testing. They also noted that at least nine large pharmaceutical companies, four of which are in developing countries, are developing pMDIs containing lower-GWP propellants.

The **Refrigeration, Air Conditioning, and Heat Pumps TOC (RTOC)** reported that the gradual transition to zero ODP, lower-GWP refrigerants resulted in more hazardous refrigerants being adopted. They also noted that energy demand for air conditioning contributed 80% of the increase in energy-related emissions between 2023 and 2024 but highlighted that adoption of more efficient appliances will partially offset increased energy use. They also observed that uptake in industrial heat pumps, replacing boilers that use fossil fuels, has been increasing in China, the US, and Europe. They further reported that water chillers used for data center cooling are now a significant part of chiller production and drew attention to the fact that artificial intelligence (AI) is starting to be used to optimize chiller plants and building design and operation.

The RTOC commented on: the shortage of refrigeration equipment and technology, especially for Article 5 countries implementing the Kigali Amendment; increased costs that affect access to essential technologies; reporting on LRM; and the low commercialization of the natural refrigerant R290. They noted that manufacturers are treading carefully because of the high flammability of R290. They said that when looking for alternative refrigerants, manufacturers must consider safety, cost, and performance, adding that there is a huge difference in safety options, and that they resorted to ISO safety standards.

The TEAP also reported on **LRM**, noting that since the publication of the LRM Progress Report, they had received inputs from Australia, Belize, Ecuador, Japan, Kenya, Maldives, Norway, Rwanda, and Switzerland. The Panel highlighted emerging policies and sector information on PFAS, sharing that broad bans on these substances could narrow the availability of alternatives as replacements for substances controlled under the Montreal Protocol and may make transitions away from ODS and HFCs more difficult. They noted that the risk of possible bans is creating uncertainty for companies working to transition from ODS and HFCs. This results in delayed investments in alternatives and technologies, delayed transitions, and reduced availability of optimized solutions. They noted sector-specific considerations including for fire suppression, foams, MDIs, and refrigeration, air conditioning, and heat pumps. The Panel highlighted that the 2026 quadrennial reports of the Environmental Effects Assessment Panel (EEAP), the SAP, and the TEAP would all contain relevant information on PFAS.

In the subsequent discussion, SENEGAL noted that nitrous oxide is also a greenhouse gas and called for more clarity on the study of this substance. The TEAP said it is not controlled under the Montreal Protocol, although it is mentioned in the Vienna Convention, and stressed that the SAP is continuously monitoring its uses. ARGENTINA underlined the need for TEAP to address the uncertainties of forecasting for alternatives.

The TEAP then presented **options for the organization of the TEAP and its TOCs**. In decision XXXV/20, the TEAP was requested to present options for "new ways of organizing their work" given the composition, balance, and workload of the Panel and its TOCs. The TEAP highlighted that over 150 independent experts from Article 5 and non-Article 5 parties are currently serving on the Panel and its Committees as unpaid volunteers. The TEAP noted that challenges to ensuring a manageable workload as well as maintaining an independent, consensus-based approach are becoming more critical, especially due to the concurrence of the ODS phase-out and HFC phase-down regimes. The Panel also clarified that the options presented were not intended to become effective before 2027.

In a first round of discussion, the TEAP addressed questions and comments from NORWAY, the US, CANADA, and the EU. The Panel clarified that they had considered a broad range of reconfiguration options and provided two viable alternatives, without indicating a preference. She added that this does not limit other options and that TEAP requested no change in the near term.

With regard to the MCTOC options, they said this is the largest TOC and there are currently three Co-Chairs. They highlighted that Option 1 would formalize a single committee with sub-groups and an additional Co-Chair. Option 2 would split the committee with two Co-Chairs for each. They explained that this was due to the broadening chemical and medical agendas and the need for additional relevant expertise.

OEWG Co-Chair Annie Gabriel noted that no changes are needed until after the TEAP concludes its quadrennial report in 2026, but added parties may wish to take a decision in 2025 because 2026 will focus on replenishment discussions. All delegates praised the work of the TEAP and welcomed the options provided. The US, UK, CANADA, the EU, and JAPAN asked for time for discussion among parties with the Co-Chairs of the TEAP and the TOCs to better understand their needs.

NORWAY, the US, AUSTRALIA, and the UK noted the TEAP's challenges of recruiting experts and that more experts from non-Article 5 countries are facing financial challenges. INDIA said the nomination process for the TOCs should include consultations with concerned governments. CHINA called for geographical and gender balance in the TEAP and TOCs.

KENYA expressed concern about low membership from the African region. PAKISTAN said future arrangements should include junior experts from Article 5 and HAT countries to ensure regional diversity, intergenerational learning, and long-term stability of TEAP's work.

The US noted the range of topics that the MCTOC takes up, underlining that any decision must take emerging issues into account. NORWAY and the EU underlined the need for a structure to address the many cross-cutting issues in the most efficient way. AUSTRALIA noted the RTOC and MCTOC's stated preference for having subcommittees that can work together in areas of joint interest. The UK and the EU welcomed discussions on the potential division of the MCTOC and two subcommittees in the RTOC, while recognizing cross-cutting issues. JAPAN expressed preference for Option 1.

CANADA acknowledged that there was a justified reason for reduced membership in the MBTOC since the Montreal Protocol has phased out critical uses of methyl bromide, except for QPS. The EU said there is still significant use of methyl bromide and emissions can be further decreased.

An informal group, co-chaired by Leslie Smith (Grenada) and Alessandro Giuliano Peru (Italy), and including the TEAP and TOC Co-Chairs, was established to continue discussions.

The group met on Tuesday and Friday to give interested delegations the opportunity to ask questions to the Co-Chairs of the TEAP and TOCs about their options for reorganization and their needs going forward given the workload, the retirement of experts, and requests from parties. Parties were particularly interested to understand cost-related aspects including how often and in what format the TOCs would meet. Some were wondering whether a reorganization could be adopted for a specific time with a commitment for review in five years, for example, or whether the reorganization could be postponed until some technologies have further evolved and cross-cutting issues have become clearer. Delegates also queried what shape a decision on the reorganization would take, pointing out that there was flexibility to increase or decrease the number of TOC members without a formal decision.

In plenary on Friday afternoon, parties agreed to forward this matter to MOP 37 for further consideration.

Life-cycle Refrigerant Management (LRM)

On Tuesday, OEWG Co-Chair Gabriel introduced this item, which is related to decision XXXVI/2 requesting the TEAP to include updated relevant information on LRM in its 2025 and subsequent progress reports. NIGERIA called for support for the reclamation and destruction of refrigerants in Article 5 countries to ensure proper monitoring, verification, and compliance. The EU described their new law for companies to register and report on quantities of reclaimed and recycled refrigerants and highlighted that the first data from 2024 points to a 250% increase in quantities reclaimed. SAUDI ARABIA said LRM must be voluntary and should not be connected to the HFC phase down.

CUBA then introduced their proposal (contained in Annex II of UNEP/OzL.Pro.WG.1/47/2) on the development of studies and strategies to find medium- and long-term solutions to the accumulation of inventories of refrigerant gases nearing the end of their life cycles in Article 5 countries, to comply with commitments under the Protocol by the agreed dates. They explained that the proposal calls on the TEAP to conduct a study of accumulated waste refrigerants globally and to provide information on the reclamation and destruction capabilities of parties. SENEGAL, NORWAY, CHINA, COLOMBIA, and others welcomed further discussions on this issue.

FEDERATED STATES OF MICRONESIA and MOZAMBIQUE supported the proposal, called for the TEAP to include this information in its progress report, and suggested establishing a contact group to further discuss the proposal. GRENADA noted that this issue has implications for Article 5 parties meeting their implementation requirements, supporting calls for the TEAP to provide further information.

SAUDI ARABIA noted that the proposal should only address high-GWP refrigerant gases and, with KUWAIT and BAHRAIN, proposed deleting references to carbon markets and carbon credits. KUWAIT opined that carbon credits are a "crime to the environment."

CANADA, with the EU, suggested considering available information from the TEAP and other sources on end-of-life refrigerants, noted that the Secretariat compiles a list of countries with reclamation facilities, and called on parties with these capacities to submit information to the Secretariat. CANADA further pointed to available information on the ozone website on LRM, including submissions and information on international initiatives on this issue.

The US noted that all parties, not just Article 5 parties, need to address this issue; highlighted concerns on the reference to carbon markets; and underlined the value of a list of reclamation facilities and technologies, but stated that the proposal was not developed well enough to serve as a basis for discussions.

In response to the statements made, the TEAP noted that the Panel had modeled available information on inventories and opportunities for destruction in global banks but noted that additional data would be required from parties to assess national destruction facilities. The Secretariat confirmed that it does publish data on reclamation facilities, but noted the last submission was made in the year 2000.

CUBA announced that they would submit their proposal in the form of a CRP, which could then be discussed in a contact group.

On Tuesday afternoon, CUBA introduced their CRP (UNEP/OzL.Pro.WG.1/47/CRP.4), with CHILE and the DOMINICAN REPUBLIC as co-sponsors. OEWG Co-Chair Gabriel proposed, and delegates agreed, to establish a contact group, co-chaired by Morane Godfrin (France) and Sergio Merino (Mexico).

The group met three times between Tuesday and Friday to address the proposal. In response to queries, the TEAP confirmed that it would be feasible to prepare a report on used and unwanted refrigerants containing controlled substances. Delegates debated whether such a report would contain:

- an analysis of inventories of used and unwanted controlled substances, including estimates of the quantities accumulated in Article 5 parties;
- an assessment of countries with destruction, reclamation, and recycling facilities for controlled substances, and/or the capacities of countries that possess the technological and economic means for the destruction of controlled substances and whose national legislation allows for the transboundary movements of these substances; and
- an estimate on the costs and requirements for capacity building in Article 5 countries, with the aim of enabling the environmentally sound disposal or destruction of their unwanted controlled substances.

Some delegations highlighted that not all countries have inventories of used and unwanted refrigerants containing controlled substances, with some also querying the need for an assessment of quantity estimates of these controlled substances in developing countries. The proponents noted the inventories to be assessed would be those funded by the MLF and underscored that gaining information on the quantity estimates would provide real data on ODS banks.

Some suggested that the TEAP instead prepare scenarios, based on the potential climate and ozone benefits, considering classification by consumption, region, and the capacity of the countries in the framework of end-of-life management and disposal of controlled substances in an environmentally sound manner.

Delegates then discussed the preambular paragraphs. The proponents, responding to concerns, suggested deleting eight of the paragraphs, with four remaining. Two delegations preferred bracketing reference to "mitigation of climate change" in reference to the Protocol's objectives and contribution to protecting the ozone layer. The group compromised, agreeing to retain a reference to "climate" in this regard. The contact group later considered a revised version of the text, submitted by the proponents, and additional amendments submitted by three parties.

Delegates ultimately agreed that the requested TEAP report would address the identification of existing destruction and reclamation facilities that can accept used refrigerants from other countries, and the conditions associated with exporting used refrigerants for disposal at such facilities, taking into account any legislative barriers to transboundary movements.

One delegate proposed a new paragraph requesting parties to submit to the Secretariat information on existing reclamation and destruction facilities in their country and, where available, the respective capacity of those facilities, and requesting the Secretariat to make this information available to the parties. However, there was no time to discuss this proposal.

In plenary on Friday, Co-Chair Merino reported on the work of the contact group and parties agreed to submit the revised CRP.4 to MOP 37 for further consideration.

MDIs with Low-Global-Warming-Potential Propellants

On Tuesday, OEWG Co-Chair Wellington introduced this item, which is related to decision XXXVI/6 encouraging parties to raise awareness of MDI propellants with low GWP and to promote the availability of other sustainable alternatives, while recognizing the need to ensure patient access to critical health remedies. The decision also invited parties that produce MDIs to submit relevant information to the Secretariat.

OEWG Co-Chair Wellington stated that the TEAP will consider the two submissions received on this topic by the EU and the US. The EU underscored that the phase out of high-GWP MDIs is possible with DPIs as a very promising alternative. INDIA referred to progress with its trial and approval processes.

The RUSSIAN FEDERATION and BANGLADESH cautioned against putting environmental interests before health interests and emphasized that countries should make their own choices on how to address this issue. LESOTHO suggested that greater collaboration is needed. TUNISIA, CUBA, and ARGENTINA called for making alternatives accessible as soon as possible. The US stated that the transition process will take time, be costly, and require transparent patient-doctor communication. Parties agreed to reflect this discussion in the meeting report.

Other Issues

On Tuesday, Co-Chair Wellington noted that parties had suggested panel membership changes, halon 1301 and fire suppression agents, VSLS, and PFAS as additional issues to be discussed. On panel membership changes, she noted that no nominations had been submitted yet, and called on interested parties to consult, proposing further discussions at MOP 37.

Halon 1301 and fire suppression agents: AUSTRALIA noted its intention to submit a CRP on this issue, supported by CANADA, the EU, and the UK. The UK recognized the governance complexities involved and, with CANADA and SWITZERLAND, welcomed advanced coordination with ICAO.

CANADA noted that this is a time sensitive issue, highlighting that a decision taken at MOP 37 would be too late to inform the ICAO discussions. They noted that there is a concerted transition to the PFAS 2-BTP in fire suppression in Europe, opining that this indicates that this alternative would not be banned. With the EU and SWITZERLAND, they called for a contact group on this issue.

The EU underlined that there are no restrictions on the substance 2-BTP in the region, noting that any future restrictions would not apply in cases where no alternatives are available. They supported further coordination with ICAO to refine estimates on halon 1301 stocks. NORWAY expressed concern over the potential extension of the use of halon 1301 beyond 2024, noting that the alternative 2-BTP exists, albeit as a PFAS. They pointed to an EU-internal proposal, still under discussion, on the elimination of PFAS, but with limited exemptions for essential uses. They underlined the need for ICAO to consider the EU proposal.

NEW ZEALAND called on the TEAP to liaise with their counterparts at ICAO on this issue. The US, with NEW ZEALAND, NORWAY, and SWITZERLAND, encouraged parties to coordinate directly with ICAO counterparts. The US urged disaggregating the issues of enduring and non-enduring uses of halons, noting that halons will continue to be used in type certification for new aircraft, given that there is no ban on their use. They noted that even though

halons ensure fire safety in aircraft, alternatives are available, including 2-BTP. They emphasized that halons should be used only where clean alternatives are not viable and called for a discussion of other fire suppression agents in this regard. The RUSSIAN FEDERATION supported the US, and also opined that there are no viable alternatives to halon 1301, cautioning against advising ICAO otherwise. They did not support a CRP on this issue.

On Wednesday morning, AUSTRALIA, also on behalf of co-sponsors Canada, the EU, Norway, New Zealand, Switzerland, UK, and US, introduced their proposal on halon 1301 and its continuing use in the aviation industry, and management of other controlled substances used for fire suppression (UNEP/OzL.Pro.WG.1/47/CRP.6), and an annex containing an explanatory note. A contact group was established, co-chaired by Jana Mašíčková (Czechia) and Juan José Galeano (Argentina), and met on Wednesday and Thursday.

The group requested more information on whether there are alternatives to halon 1301, with the FSTOC underscoring that currently there are no certified alternatives, and sharing that, if previous testing for alternatives resumed, it would still take at least three or four years before they could be applied. On language calling for parties to reassess their trade restrictions around fire suppressants to meet existing needs, FSTOC noted that other than halon 1301, substances used in laboratories and hand-held fire suppressants should also be considered. Some delegates underscored that this would ensure that the decision covers all controlled substances used in fire suppression. Others reserved the right to advocate for a decision focused solely on halons.

Delegates managed to finalize a full reading of the text, debating whether parties should be encouraged, invited, or requested to submit information to the Secretariat on alternatives to ODS for use in fire suppression. Some preferred to delete this paragraph altogether.

In plenary on Friday morning, Co-Chair Mašíčková reported on progress made in the contact group. AUSTRALIA proposed adding the annex of the CRP to the OEWG 47 meeting report so that delegates can refer to it when liaising with their national aviation authorities ahead of the ICAO Assembly in September 2025. OEWG Co-Chair Gabriel proposed, and delegates agreed, to further consider related issues at MOP 37.

Very short-lived substances: VSLS are ODS, but unlike long-lived ODS, only a fraction of emitted VSLS reach the stratosphere where they augment chlorine, deplete ozone in the short term (months rather than decades), and can have an impact on the ozone layer.

The EU provided further rationale for having proposed this subitem, referring to the increasing contribution of VSLS to stratospheric concentrations of ODS and highlighting increasing emissions from the use of solvents, foam blowing, and chromatography. They highlighted regulatory approaches to VSLS in the EU presented in their submission to the Secretariat and encouraged other parties to make voluntary submissions as well. CANADA reminded parties that the topic of VSLS would be dealt with as part of the 2026 quadrennial assessment reports. This was confirmed by OEWG Co-Chair Gabriel who closed this subitem and invited parties to submit further information to be added to the Secretariat's compendium.

Per- and polyfluoroalkyl substances: PFAS are a group of thousands of synthetic chemicals characterized by strong carbon-fluorine bonds, making them very stable and resistant to degradation. If not contained, they accumulate in soil, water, air, and eventually in living organisms with impacts on their health. The EU raised concerns on how the issue of PFAS is addressed in the TEAP and EEAP reports, how the risk of trifluoroacetic acid (TFA) was qualified as *de minimis* by the EEAP, and how the risk from TFA is likely to be addressed in EU legislation. NORWAY and SWITZERLAND shared the concern about the EEAP's risk assessment of TFA, referring to newer studies and the precautionary principle. CANADA opined that many aspects relating to PFAS were already being monitored and considered by the TOCs, which needed to continue.

The US, KUWAIT, and TRINIDAD AND TOBAGO cautioned against politicizing the scientific assessment of substances and warned that the uncertainty around the alternatives to HFCs from the discrepancies in the approach to PFAS could undermine the implementation of the Kigali Amendment. The US further stated that HFC phase-down paths should be technology neutral, and KUWAIT referred to the particular risks of being both a HAT country and technology taker. SAUDI ARABIA supported a holistic assessment of PFAS.

OEWG Co-Chair Gabriel proposed, and delegates agreed, to reflect this discussion in the meeting report.

Feedstock Uses of Controlled Substances

On Tuesday afternoon, OEWG Co-Chair Wellington introduced this item related to decision XXXVI/5, including the Secretariat's compilation of information submitted from five parties on production and use of feedstocks (UNEP/OzL.Pro.WG.1/47/3).

SAUDI ARABIA reminded parties that the emissions of controlled substances for feedstock uses are not controlled under the Montreal Protocol and cannot be eliminated in the absence of alternatives.

The EU and SWITZERLAND expressed concern that feedstock production and related emissions continue to grow and are higher than previously assumed, and this will delay recovery of the ozone layer. The EU reminded parties that the feedstock exemption was established by the parties with the understanding that emissions would be insignificant, but this is not the case. The EU said they were working on a proposal and, supported by SWITZERLAND and NORWAY, called for establishing a contact group.

CHINA said the OEWG needs to take into consideration that: the production and use of feedstocks is driven by downstream manufacturing and should be grounded in market realities; feedstock uses cross a lot of sectors and emissions have complex factors to manage; and management practices vary across countries. AUSTRALIA recommended publishing country submissions on the Montreal Protocol website.

On Wednesday morning, the EU and SWITZERLAND introduced their proposal on feedstock uses of controlled substances (UNEP/OzL.Pro.WG.1/47/CRP.5). A contact group was established, co-chaired by Morgan Simpson (UK) and Liana Ghahramanyan (Armenia). The group met on Wednesday and Thursday.

In the contact group, delegates posed questions to the co-sponsors. Many asked for more clarity on the kind of information the CRP was requesting parties to submit and how the proposed

31 March 2026 deadline would fit with the MCTOC and TEAP schedules so that their analysis can be included in the progress reports for OEWG 48. Other questions involved how much overlap there was with decision XXXVI/5 taken by MOP 36, the level of monitoring required, and the fact that feedstock uses are currently exempt under the Protocol.

The co-sponsors acknowledged that it might be difficult for the TEAP to provide an analysis of the data submitted on feedstock emissions in their 2026 progress report, proposing that the 2026 progress report could be based on data submitted in response to the 2025 decision on feedstocks (XXXVI/5). They also suggested that the TEAP could provide the data analysis from this decision in its 2027 progress report instead, adding that any future data could be reported in 2028. One delegation said they shouldn't be negotiating the text on the timelines without knowing what parties are being asked to report. Participants underlined that the TEAP should not be requested to analyze the same data twice.

When the contact group discussed the text on the data requests from parties, one delegation noted that, in practice, emissions data relies on published research or papers and duplicating the work may waste resources. They suggested that the research community could submit data instead of parties. The proponents informed the group that they would continue to consult with interested parties.

In plenary on Friday, Co-Chair Ghahramanyan reported that the contact group had been able to address all the operative paragraphs of the CRP. Responding to a question by the EU and statements from the US and CANADA, she explained that brackets around the preambular paragraphs had been inserted after the contact group discussions to reflect that this text had not yet been negotiated. Delegates agreed to insert a footnote in the CRP to clarify this and agreed to forward the CRP to MOP 37 for further consideration.

Enhancing Regional Atmospheric Monitoring of Controlled Substances

OEWG Co-Chair Gabriel introduced this issue (including UNEP/OzL.Pro.WG.1/47/INF/4), noting the request to the Secretariat to report progress on evaluating the suitability of potential sites for monitoring regional emissions. The Secretariat and members of the Advisory Committee of the Vienna Convention General Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention (GTF) presented on the progress on decision XXXVI/1.

The Secretariat noted that the Advisory Committee had been expanded to include six new experts addressing monitoring of controlled substances, and shared that the Committee, at its last meeting, discussed, *inter alia*, the key outcomes of the EU-funded pilot project ("Regional quantification of emissions of substances controlled under the Montreal Protocol") and the linkages to its work. She also highlighted that the Committee had agreed an amendment of its ToR would be required to reflect its new structure and mandate.

Via video, Ravi Shankara, GTF Advisory Committee, presented on the Committee's work evaluating the suitability of potential sites, noting the lessons learned from establishing the monitoring station on Bhola Island in Bangladesh. He noted, among many other things, that any sites eventually chosen by parties will require new Observation System Simulation Experiments (OSSEs).

In response to questions from the RUSSIAN FEDERATION, CANADA, the EU, KENYA, the US, and IRAN, the Secretariat noted that potential regional monitoring sites could be situated in India, Viet Nam, Saudi Arabia, Mexico, Algeria, Botswana, Brazil, the Russian Federation, and Ecuador. The Advisory Committee pointed to the existing monitoring infrastructure under the World Meteorological Organization's Global Atmosphere Watch (GAW) network, and an existing site in Australia that covers the Pacific region. The Secretariat noted that the EU pilot project funds were used for this analysis, which did not focus on existing stations, and the Advisory Committee underlined that overlapping measurements from regional sites could be beneficial in triangulating emissions sources in the region.

In the discussion, the EU expressed thanks to the US for its leadership on this issue and said it would not present a CRP at this stage since additional information will be presented at MOP 37.

SAUDI ARABIA insisted on ensuring that the monitoring of ODS be based on voluntary action with respect for state sovereignty. The UK and AUSTRALIA committed to enhancing global atmospheric monitoring and asked for clarity on the scope of these initiatives to avoid duplication of work.

The US encouraged all parties to consider establishing monitoring stations of their own. CANADA raised questions about sources of financing for atmospheric monitoring facilities.

The NATURAL RESOURCES DEFENSE COUNCIL, echoed by NORWAY, acknowledged the US support for atmospheric monitoring as "our eye in the sky," but expressed concern that this support was at serious risk due to national budget cuts. They urged all parties not to rely on only one country for atmospheric monitoring, calling on others to increase their contributions.

OEWG Co-Chair Gabriel proposed, and delegates agreed, to convene an informal group for further discussion, co-facilitated by Sophia Anselm-Larocque (Dominica) and Alain Wilmart (Belgium).

During the informal session, one delegation recalled that the EU pilot project to identify suitable monitoring sites would conclude at the end of 2025, but that there was additional funding to ensure continuity of atmospheric monitoring activities. They pointed to the short-term EUR 4.5 million grant from the EU to UNEP to support the establishment of three monitoring stations and to the funding window under the MLF that could finance a limited number of pilot projects. They also pointed to USD 400,000 from the Montreal Protocol Trust Fund for atmospheric monitoring activities.

In the ensuing discussion, delegations called for clarity on the expected use of the funds. The Advisory Committee pointed to the funding needs outlined in their presentation, including to:

- identify and prepare a map of possible monitoring locations and the regions from which the emissions could be measured;
- identify and prepare a map of the potential sites for establishing monitoring stations in those locations;
- assist the Secretariat in updating cost estimate options for long-term financing associated with enhancing atmospheric monitoring;
- develop a list of scientific institutions (national and international) that work on atmospheric monitoring and related issues, with whom the Committee should ensure coordination, cooperation, synergies, and partnership; and
- start planning for the longer-term work on calibration, data validation and sharing, and capacity building.

Delegates called on the Secretariat and the GTF to present a suggested allocation of funds for future atmospheric monitoring activities to MOP 37.

In plenary on Friday morning, Co-Chair Anselm-Larocque reported on the discussions of the informal group and delegates agreed to close this agenda item and further consider it at MOP 37.

Further Strengthening the Montreal Protocol Institutions

On Wednesday, OEWG Co-Chair Wellington introduced this issue relating to decision XXXVI/9. The Secretariat introduced the summary of common features of licensing systems (UNEP/OzL.Pro.WG.1/47/4) and a compilation of information provided by parties on illegal trade in controlled substances and synthesis of best practices (UNEP/OzL.Pro.WG.1/47/5). She also noted that the Secretariat had been requested to convene a one-day informal meeting of the parties back-to-back with MOP 37. OEWG Co-Chair Wellington highlighted that the analysis of systemic issues in relation to compliance based on cases considered by the Implementation Committee over the past 10 years had been circulated to inform discussions at OEWG 47.

In the ensuing discussion, delegates proposed issues to be addressed at the informal meeting. The EU noted that the Implementation Committee's analysis of systemic compliance issues should be a basis for discussion at the informal meeting and noted that discussion may be needed to assess cases of non-compliance where parties do not self-report. They also called for discussions on the issues related to licensing systems and, with CANADA, SWITZERLAND, and the UK, suggested an informal discussion at OEWG 47 to identify topics for discussion during the informal meeting to be held before MOP 37.

MALI called for discussions on the need to include provisional data in compilations of information on licensing systems. IRAN welcomed the update of the informal prior informed consent (iPIC) mechanism, calling on other countries to join the mechanism to combat illegal trade. TÜRKIYE called for practical guidance to effectively implement licensing systems in countries with high trade volumes and requested clarification of the duties and responsibilities of importing, exporting, and transit countries in cases of illegal trade.

OEWG Co-Chair Wellington proposed, and delegates agreed, that interested parties would meet with the Secretariat in an informal group to consider topics that could be discussed at the informal meeting.

On Thursday, in a brief stocktaking plenary, the Secretariat highlighted that informal consultations were held on Thursday morning. There were calls for meaningful discussions at the informal meeting on licensing systems, illegal trade, and systemic compliance issues. There were also calls for a variety of discussion formats to address these issues. Thanking those delegations that had participated, the Secretariat noted that they had taken copious notes on the discussions that would inform the planning of the informal meeting.

OEWG Co-Chair Wellington then closed discussions on this issue.

Review of the Need for HCFCs for Servicing and Non-Servicing Applications for 2030–2040

On Wednesday morning, OEWG Co-Chair Gabriel introduced this agenda item, which was called for in decisions XIX/6 and XXX/2. She noted that MOP 19 had agreed to accelerate the phase-out of production and consumption of HCFCs and agreed that each Article 5 party that had completed the accelerated phase-out of production and consumption of HCFCs in 2030 would be allowed consumption of an annual average of 2.5% of the average of its calculated levels of production in 2009 and 2010 for the period 2030–2040, provided that such production or consumption was restricted to the servicing of refrigeration and air-conditioning equipment existing on 1 January 2030.

BANGLADESH, ARGENTINA, CHINA, MALAYSIA, LESOTHO, ARMENIA, INDONESIA, and BHUTAN all supported keeping the 2.5% servicing tail so they can continue to service existing HCFC equipment until 2040. They argued that despite phase-out efforts there is a continued reliance on HCFCs in areas where replacement and retrofitting options are not available or where there are economic constraints. ARGENTINA added that they do not have alternatives to modify refrigeration equipment on fisheries boats and INDONESIA said HCFCs are still used in fire suppression in office buildings.

Since there was unanimity on retaining the 2.5% tail for servicing and other applications, delegates agreed a decision is not needed since there will be no change. This agenda item was closed with that understanding.

Classification of the State of Palestine and Access to Support from the MLF

OEWG Co-Chair Wellington introduced this item on Wednesday, referring to previous discussions of this topic at COP 13/MOP 36 (UNEP/OzL.Conv.13/8–UNEP/OzL.Pro.36/9, para. 13; UNEP/OzL.Conv.13/2 -UNEP/OzL.Pro.36/2, paras. 103 and 104, Annex III; UNEP/OzL.Conv.13/2/Add.1– UNEP/OzL.Pro.36/2/Add.1, paras. 31 and 32, Annex III).

The STATE OF PALESTINE presented its proposal (UNEP/OzL.Pro.WG.1/47/CRP.2), based on its accession to the Vienna Convention and the Montreal Protocol in 2019, and the respective right to access the MLF as a party to be listed under Article 5 of the Protocol. They highlighted their numerous implementation activities and regulatory actions despite limited resources and minimal contribution to ozone depletion. They emphasized their focus on promoting ozone friendly and energy efficient technologies as an illustration of their commitment to the goals of the Protocol. They explained that recognition under Article 5 and access to financial and technical support under the MLF are essential for enhancing their institutional and technical capabilities and the further implementation of the Ozone Treaties.

The proposal was supported by KUWAIT, SAUDI ARABIA, LEBANON, BAHRAIN, CUBA, INDONESIA, TUNISIA, IRAQ, SYRIA, CHINA, IRAN, MALDIVES, EGYPT, QATAR, BANGLADESH, BRAZIL, SENEGAL, SOMALIA, BOSNIA AND HERZEGOVINA, NORWAY, MOROCCO, the RUSSIAN FEDERATION, PAKISTAN, TÜRKIYE, UNITED ARAB EMIRATES, MALAYSIA, and MAURITANIA. These delegations

pointed to the principles of equity, inclusion, and fairness as well as the spirit of the ozone family to leave no one behind in international cooperation to meet the goals of the Protocol.

The US opposed the proposal, referring to their previous comments on this topic and reiterating their stated position not to consider the State of Palestine as eligible to join the Ozone Treaties. They also noted that the State of Palestine has not ratified the London Amendment, which established the MLF and expressed doubts as to the robustness of the State of Palestine's data relative to the Montreal Protocol. SENEGAL and NORWAY encouraged the State of Palestine to ratify the amendments to the Protocol.

The US also reiterated their position that China, as the largest producer and consumer of controlled substances under the Protocol, should be removed from the list of Article 5 countries benefitting from financial support, arguing that such support was no longer needed. CHINA opposed this proposal and urged parties to stick to the agreed agenda for this meeting.

OEWG Co-Chair Wellington concluded that there was no consensus on the CRP, despite strong support for the proposal by the State of Palestine. She suggested, and delegates agreed, to convene informal discussions in the margins of the meeting, and to determine a way forward later in the week.

In plenary on Friday, the STATE OF PALESTINE updated delegates on a constructive informal discussion with the US, Norway, and Senegal. He expressed the conviction that "everything can be resolved by dialogue," committed to the submission of all documentation needed to meet parties' expectations, and suggested further discussions at MOP 37. He stated that despite the current humanitarian crisis in his country, the State of Palestine remained steadfast in their commitment to the Montreal Protocol.

The US acknowledged that the informal discussion helped to take an initial step towards clarifying some of the issues raised previously. SENEGAL called for assistance by the Secretariat and all parties to resolve this matter.

The US also reiterated their view that China should be removed from the list of Article 5 countries given current economic realities. This was strongly opposed by CHINA, who underscored their status under public international law.

OEWG Co-Chair Wellington proposed, and delegates agreed, to bracket the CRP and forward it to MOP 37 for further consideration.

Other Matters

On Wednesday, RWANDA introduced a proposal on national and regional initiatives to support implementation of the Kigali Amendment to the Montreal Protocol (UNEP/OzL.Pro.WG.1/47/CRP.1). They outlined that the text requests the Secretariat to organize a one-day workshop before MOP 38 in 2026 to share information and experiences of existing regional centers of excellence and their approaches in promoting sustainable cooling and cold chains, and explore interlinkages with the implementation of the Kigali Amendment. They also noted that the text requests a background document on the same issue. They highlighted the request to the MLF Executive Committee (ExCom) to provide a funding window for non-manufacturing activities to support Kigali Amendment implementation, in particular through regional centers of excellence.

As co-sponsor of the proposal, the UK noted the importance of regional centers of excellence in the implementation of the Kigali Amendment, supported a funding window under the MLF to support these centers, pointed to the work of existing centers of excellence in Rwanda and Kenya, and called for further discussions in a contact group.

SENEGAL, FEDERATED STATES OF MICRONESIA, BOTSWANA, CAMEROON, TUVALU, GRENADA, LESOTHO, NIGERIA, SWITZERLAND, NAMIBIA, CHINA, TOGO, MOZAMBIQUE, and many others supported the proposal and the call for contact group discussions.

SENEGAL drew attention to the center of excellence in their country. FEDERATED STATES OF MICRONESIA noted that centers of excellence can promote a more standardized process for Kigali Amendment implementation and could address the loss of human resources experienced in some small island developing states, noting this could enhance economies of scale. TUVALU underlined that the Kigali Amendment helps to address the existential threat posed by climate change.

BOTSWANA underlined the need to invest in capacity to test and verify equipment to ensure compliance. CAMEROON noted that 2026 will be the tenth anniversary of the adoption of the Kigali Amendment. GRENADA stressed that the proposal would strengthen ongoing discussions at the Executive Committee on similar regional initiatives. LESOTHO highlighted that the center of excellence in Rwanda (the Africa Centre of Excellence for Sustainable Cooling and Cold-Chains) will strengthen Kigali Amendment implementation throughout the continent. NIGERIA shared that Article 5 parties lack the capacity to monitor emissions of controlled substances from refrigeration and cooling equipment.

BAHRAIN supported advancing the discussions on the role of the centers of excellence in the implementation of the Kigali Amendment. The EU underlined the need for more information on the functioning of these centers. EGYPT highlighted the need for national centers of excellence alongside regional ones and supported the proposal for a one-day workshop to address this issue.

CANADA, supported by the US, expressed concern about the proposal for a one-day workshop, noting funding considerations, proposing instead an extended side-event on the margins of the 2026 OEWG meeting. He noted that the ExCom was already going to consider funding initiatives such as regional centers and suggested that a funding window for non-manufacturing activities under the MLF may not be sufficient.

TRINIDAD AND TOBAGO welcomed the proposed funding window for non-manufacturing activities. As a host of a regional center of excellence, ARMENIA welcomed the opportunity to expand the activities of these centers, and supported a contact group discussion.

The US supported inviting submissions relating to sustainable coolants and cold chains, which, they said, should form the basis of the requested background paper. They called for a broader focus apart from regional centers of excellence and expressed skepticism about the reference to energy efficiency.

MYANMAR said they had not received requisite support for Kigali Amendment implementation. KENYA described their work on cooling and cold chains.

OEWG Co-Chair Gabriel noted the support for the CRP, as well as some reservations. The OEWG established a contact group, co-chaired by Mariska Wouters (New Zealand) and Camilla Noel (Vanuatu).

In the contact group, delegates provided comments on the CRP, with some calling for additional language on: "national" centers of excellence in addition to regional ones; and funding sources to support the centers. Some delegations expressed reservations on the proposed one-day workshop, noting resource constraints related to the Secretariat's budget. One delegate suggested hosting an "event" rather than a workshop. A delegation requested the Secretariat to circulate a tentative budget for this workshop/event. Others called for, among other things:

- information on the funding models to support the centers;
- data on the number of regional centers of excellence in existence globally;
- clarity on the scope of the CRP, including its role in relation to energy efficiency testing centers; and
- further discussions on the definition and role of centers of excellence in the context of MLF funding for Kigali Implementation Plans.

On a request to the Secretariat to prepare a background document, delegates called for clarity on when this document would be prepared, with the proponents suggesting that this could be done ahead of MOP 38. Others preferred a broader scope for the document.

Delegates also discussed deleting a request to the ExCom of the MLF to consider providing a funding window to address non-manufacturing activities to support implementation of the Kigali Amendment, in particular related to regional and/or national centers of excellence that promote sustainable cooling and cold chains, including for the integration of testing centers for energy efficiency.

In plenary on Friday, Co-Chair Noel reported on the work of the contact group. Delegates agreed to forward the proposal to MOP 37 for further consideration, with OEWG Co-Chair Gabriel encouraging intersessional consultations.

Closing Plenary

On Friday afternoon, delegates adopted the meeting report (UNEP/OzL.Pro.WG.1/47/L.1 and Add.1), with editorial amendments from CHINA, the EU, SWITZERLAND, and the US. BAHRAIN requested that at future meetings, official translations of the report be made available for all delegates to consider.

The DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA cautioned against "forces" that were in place to divide the Montreal Protocol into two political camps and called for the eradication of negative attitudes. The US raised procedural concerns about this statement. OEWG Co-Chair Wellington noted that both statements would be reflected in the meeting report.

In closing remarks, OEWG Co-Chair Wellington encouraged parties to continue discussions intersessionally, thanked all delegations for their hard work, and closed the meeting at 3:12 pm.

A Brief Analysis of OEWG 47

The Montreal Protocol on Substances that Deplete the Ozone Layer is a clear example of the benefits of multilateral solutions to global problems. Without the Montreal Protocol, severe ozone depletion would have compromised human health, food production, ecosystems, and, in a sense, life on Earth. The success of the Montreal Protocol is due, in large part, to its ability to keep up with the evolution of science and technology. But the rapid pace of this evolution makes its task difficult. The Open-ended Working Group (OEWG) focuses on this very challenge by reviewing the robust research and analysis by the Ozone Treaties' Assessment Panels, and submitting its work and recommendations to the Meeting of the Parties (MOP).

This brief analysis will examine the scientific and technological challenges addressed by OEWG 47 that will continue to reshape the Protocol in its mission to restore the Earth's ozone layer and reduce potent greenhouse gases that contribute to climate change.

Keeping up with Science and Technology

The work of the Technology and Economic Assessment Panel (TEAP) and its Technical Options Committees (TOCs) provides the underlying scientific and technical information to support policy making. In fact, TEAP and its TOCs are responsible for many of the Protocol's successes. The Panel and its Committees are comprised of 150 experts who volunteer their time, with the majority serving for over a decade.

At OEWG 47, these bodies provided their annual progress report addressing, *inter alia*: the replacement of substances with a high global-warming potential (GWP) in foams, fire suppressants, metered-dose inhalers (MDIs), and refrigeration, air conditioning, and heat pumps; the extent of remaining quarantine and pre-shipment (QPS) uses of methyl bromide; the use of hydrochlorofluorocarbons (HCFCs) as feedstocks; and the potential impact of policies restricting the use of per- and poly-fluoroalkyl substances (PFAS) on the transition away from ozone depleting substances (ODS) and hydrofluorocarbons (HFCs). This report provided the basis for most of the OEWG's discussions.

But change is needed for the TEAP and its TOCs to keep up with the rapidly changing realities on the ground. While parties rely on these experts to advise their actions in all areas of production, consumption, end-use, management, disposal, and destruction of controlled substances, these experts face challenging circumstances of their own. As the Protocol's mandate expands, their workload continues to grow. Increased scientific and technological developments require them to publish up to 18 reports each year. What's more, a number of these experts are moving toward retirement age and risk not being replaced as potential candidates do not always have the time to volunteer and funding is often quite limited, especially when it comes to paying for experts' travel to in-person meetings.

To address this, the TEAP presented options to ensure its continued functioning. These options include reconsidering the number of members and TOC Co-Chairs, as well as different reconfigurations of the TOCs by either creating subcommittees in some of the existing TOCs or splitting these TOCs into new ones so that subject matter and cross-cutting issues are covered effectively and efficiently. At OEWG 47, there was general agreement among parties and members of the TEAP that the large Medical and Chemicals TOC was a good candidate for reorganization. In fact, one delegate referred to it as the "Everything Bagel TOC" due to its ever-expanding mandate.

It was apparent in the continued praise for the TEAP and TOCs that delegates do not take the work of the Panel and its Committees

for granted. But much as restructuring is necessary, it is not yet pressing. Any changes to the structure of the TEAP and its TOCs would not take effect until after completion of the 2026 quadrennial assessment report.

Delegates at OEWG 47 did make some headway on this issue, engaging informally with the TEAP to understand the technicalities and financial implications of the reconfiguration options tabled, and perhaps considering some new ones. For example, could there be a broader role for the newly established Intergovernmental Science-Policy Panel on Chemicals, Waste and Pollution (ISP-CWP)?

Keeping an Eye on Alternatives

Another key to the Montreal Protocol's success is the availability of alternative substances that do not deplete the ozone layer or contribute to climate change. This is a challenge, because it remains difficult in some industries to transition to such alternatives at a global or at least substantial scale.

One such industry is pharmaceuticals. Many people suffering from asthma, chronic obstructive pulmonary disease (COPD), and other respiratory ailments are dependent on metered-dose inhalers (MDIs) that use HFC propellants. Alternative technologies, including dry powder inhalers (DPIs), are under development, but the testing, trialing, and approval processes are lengthy, and alternative products can be more costly. During OEWG 47, many parties made it clear they would always prioritize human health over environmental considerations if they had to choose between options that are not equivalent. With the increasing prevalence of asthma and COPD, it is even more crucial to find cost-effective alternatives.

Another such industry is global civil aviation. Halon 1301, an ODS, is an effective fire extinguishing agent historically used in aviation. The International Civil Aviation Organization (ICAO) currently mandates that halon 1301 cannot be used in cargo compartments of new aircraft designs after 2024. But the global civil aviation industry is preparing to submit a request to extend this date to 2035, due to the significant long-term uncertainty and apprehension caused by potential regulations against the halon 1301 replacement, 2-BTP, which has been classified as one of thousands of PFAS.

For OEWG 47, this was a two-pronged challenge. First, delegates had to address how they could inform and influence the ICAO discussions. The challenge is that ICAO Assembly will meet before MOP 37, which led some parties to suggest that delegates should resort to informal engagements with their national aviation authority counterparts, facilitated by background information annexed to the OEWG 47 meeting report.

Secondly, parties also had to acknowledge the difficulties presented by PFAS being an alternative to ODS, and indeed, how to assess and manage risks related to PFAS, which was one of the most contentious issues at this OEWG. Some parties invoked the precautionary principle, pointing to scientific studies on the carcinogenic effects of this class of chemicals, while others prioritized the transition away from controlled substances over the "minimal" risks related to PFAS.

For both industries (aviation and pharmaceuticals), many developing country parties are dependent on technological developments elsewhere since, as one delegation noted, they are "technology takers" and do not have manufacturing industries of their own. These countries pointed out how important it is to give them as much certainty as possible on the path forward so that technology investments do not go to waste.

One area where developing countries obtained certainty was the servicing of existing refrigeration and air conditioning equipment. OEWG 47 confirmed that developing countries will still be able to consume up to 2.5% of their original HCFC production average for servicing existing equipment until 2040. This illustrates that even when alternatives to controlled substances are available, it can take years or even decades until a sector fully transitions, considering the life span of existing equipment.

The Eye in the Sky

Transitioning to alternative substances is a challenging yet essential process on the path to restore the ozone layer and protect the climate. To ensure effectiveness, however, rigorous monitoring of emissions releases is essential. The history of the Montreal Protocol is sprinkled with examples where emissions collectively reported by parties and emission estimates from atmospheric monitoring differed considerably. At MOP 36 (also serving as COP 13 for the Vienna Convention) in 2024, parties agreed in principle to close the gaps in the global atmospheric monitoring network, evaluate the suitability of potential sites for regional monitoring, and fund a limited number of pilot projects from the Vienna Convention General Trust Fund (GTF).

After hearing updates from the GTF Advisory Committee and the Secretariat, delegates were hopeful progress could be made. The EU-funded monitoring station pilot on Bhola Island in Bangladesh is a success and provides valuable lessons for setting up additional monitoring stations envisaged in India, Viet Nam, Saudi Arabia, Mexico, Algeria, Botswana, Brazil, the Russian Federation, and Ecuador. One lesson learned is that Observation System Simulation Experiments should be carried out for every possible site prior to setting up a monitoring station. Despite the shared optimism, there were also widespread concerns among delegates about how to secure both funding and expertise for the completion of the global network.

These concerns were further exacerbated when the Natural Resources Defense Council (NRDC) pointed to looming budget cuts and their impact on atmospheric monitoring. For the case of the US, NRDC pointed to threatened cuts to staffing and budgets of the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA), with impacts on the operation of satellites and the availability of data. "We could lose our eye in the sky," they lamented.

Going forward, several parties underscored that the ozone family cannot afford to rely on just one country to do the heavy lifting when it comes to atmospheric monitoring. "Other countries need to step up and close this widening gap," shared one observer.

Looking Ahead to MOP 37

At MOP 37 in November 2025, parties will have to take forward their clearer understanding of the scientific and technical challenges currently facing the Montreal Protocol and adopt relevant policy decisions. However, taking action often comes down to funding, which most often comes from the Protocol's Multilateral Fund (MLF). Every three years, parties must replenish the MLF. At OEWG 47, delegates started to develop the terms of reference (ToR) for the study on the 2027–2029 MLF replenishment, which will be undertaken by a TEAP Task Force. The study's ToR will have

to be adopted at MOP 37 so that the study can inform OEWG 48 replenishment discussions. Negotiations on the ToR demonstrated how much hinges on the availability of funding, as delegations attempted to maneuver themselves into a good starting position for the negotiations in 2026.

A few political issues did come up at OEWG 47, including listing the State of Palestine as an Article 5 party and whether China should still be an Article 5 party. However, despite a few tense moments, this meeting continued the Montreal Protocol's tradition of focusing on the science and technology, rather than the politics. This may be due to the pivotal role the objective and independent Assessment Panels are playing, one participant mused. This trend bodes well for MOP 37 discussions.

Most delegates left the UN Conference Center in Bangkok with the conviction that the Protocol will be able to resolve the issues at hand in an efficient and calm manner—and with the knowledge that these successes don't happen by themselves. They are delivered through the hard work and collaborative efforts of delegates and experts fully dedicated to the protection of the ozone layer and the climate.

Upcoming Meetings

AMCEN-20: The 20th ordinary session of the African Ministerial Conference on the Environment (AMCEN-20) will convene under the theme, "Four Decades of Environmental Action in Africa: Reflecting on the Past and Imagining the Future." The session will bring together ministers and experts to discuss and provide policy guidance for the effective participation of Africa in upcoming key global environmental events, including MOP 37. **dates:** 14-18 July 2025 **location:** Nairobi, Kenya **www:** unep.org/es/regions/africa/conference-ministerielle-africaine-sur-lenvironnement

Second Part of the Fifth Session of the Intergovernmental Negotiating Committee on Plastic Pollution (INC-5.2): Delegates at INC-5 agreed to convene a resumed meeting of the fifth session, endeavoring to conclude negotiations on a treaty on plastics pollution. **dates:** 5-14 August 2025 **location:** Geneva, Switzerland **www:** unep.org/inc-plastic-pollution

21st Meeting of the Chemical Review Committee (CRC-21): The CRC to the Rotterdam Convention will review up to 30 new notifications of final regulatory action and proposals for severely hazardous pesticide formulations, and will continue to review notifications of final regulatory action and proposals for listing three severely hazardous pesticide formulations that it was unable to complete during its 20th meeting. **dates:** 23-26 September 2025 **location:** Rome, Italy **www:** pic.int

21st Meeting of the Persistent Organic Pollutants Review Committee (POPRC-21): POPRC will review the outcomes of the 12th meeting of the Conference of the Parties to the Stockholm Convention that are relevant to its work and consider the draft risk profile for polyhalogenated dibenzo-p-dioxins and dibenzofurans (PXDD/PXDF). **dates:** 29 September - 3 October 2025 **location:** Rome, Italy **www:** pops.int

Minamata Convention on Mercury COP 6: The sixth meeting of the Conference of the Parties to the Minamata Convention on Mercury will review implementation of the Convention. **dates:** 3-7 November 2025 **location:** Geneva, Switzerland **www:** minamataconvention.org/en/meetings/cop6

Informal meeting on facilitating the implementation of the Montreal Protocol: This informal meeting will precede and feed into MOP 37, and will address illegal trade, licensing, and compliance. **date:** 2 November 2025 **location:** Nairobi, Kenya **www:** ozone.unep.org/meetings/informal-meeting-facilitating-implementation-montreal-protocol

37th Meeting of the Parties to the Montreal Protocol (MOP 37): MOP 37 will continue to review implementation and strengthening of the Montreal Protocol. **dates:** 3-7 November 2025 **location:** Nairobi, Kenya **www:** ozone.unep.org/meetings/thirty-seventh-meeting-parties

For additional upcoming events, see: sdg.iisd.org

Glossary

CFCs	Chlorofluorocarbons
COP	Conference of the Parties
CRP	Conference room paper
CTC	Carbon Tetrachloride
DPIs	Dry powder inhalers
EEAP	Environmental Effects Assessment Panel
ExCom	Executive Committee of the Multilateral Fund
FSTOC	Fire Suppression Technical Options Committee
GTF	General Trust Fund for Financing Activities on Research and Systematic Observations relevant to the Vienna Convention
GWP	Global warming potential
HAT	High ambient temperature (countries)
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
HFO	Hydrofluoroolefin
ICAO	International Civil Aviation Organization
LRM	Life-cycle refrigerant management
MBTOC	Methyl Bromide Technical Options Committee
MCTOC	Medical and Chemical Technical Options Committee
MDI	Metered-dose inhaler
MLF	Multilateral Fund
MOP	Meeting of the Parties
ODP	Ozone depleting potential
ODS	Ozone depleting substances
OEWG	Open-ended Working Group
PFAS	Per- and polyfluoroalkyl substances
pMDI	Pressurized metered-dose inhaler
QPS	Quarantine and pre-shipment
RTOC	Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee
SAP	Scientific Assessment Panel
TEAP	Technology and Economic Assessment Panel
TFA	Trifluoroacetic acid
TOC	Technical Options Committee
ToR	Terms of reference
UNEP	United Nations Environment Programme
VSLS	Very short-lived substances