UNITED NATIONS

EP

United Nations Environment Programme

Distr.
GENERAL

UNEP/OzL.Pro/ExCom/96/Inf.3
25 May 2025

ORIGINAL: ENGLISH

EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Ninety-sixth meeting
Montreal, 26–30 May 2025

REPORT OF THE INFORMAL HALF-DAY SESSION ON STRATEGIC APPROACHES TO KIGALI AMENDMENT IMPLEMENTATION FOR SUSTAINABLE HFC PHASE-DOWN AND THE CONTRIBUTION OF MULTILATERAL FUND ACTIVITIES TO SUSTAINABLE COOLING

INTRODUCTION

1. The third informal half-day session on strategic approaches to Kigali Amendment implementation for sustainable HFC phase-down and the contribution of Multilateral Fund activities to sustainable cooling (decision 95/96) was held at the headquarters of the International Civil Aviation Organization (ICAO) in Montreal, Canada, on 25 May 2025.

2. The session was attended by members and co-opted members of the Executive Committee, representatives of bilateral and implementing agencies, the representative of the European Union and its 27 member States, the Ozone Secretariat and other stakeholders.

OPENING OF THE SESSION

3. The session was opened by the Chief Officer, who welcomed participants and expressed the hope that the day's discussions would produce concrete messages for further discussion at the 96th meeting of the Executive Committee. She introduced the moderator for the session, Natarajan Rajendran, a senior cooling and sustainability expert and member of the Technology and Economic Assessment Panel and the Co-Chair of the Panel's Refrigeration Technical Option Committee, and informed participants that the session's outcomes would be compiled by the Secretariat and set out in an addendum to the document already issued on the matter.[1]

[1] UNEP/OzL.Pro/ExCom/96/63.

Pre-session documents of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol are without prejudice to any decision that the Executive Committee might take following issuance of the document.

Key takeaways from the two previous half-day sessions

4. A representative of the Secretariat provided context for the present half-day session, which was the third in a series of such sessions. The first half-day session, held back-to-back with the 94th meeting of the Executive Committee, had offered a brainstorming platform and consisted of four rounds of discussion, on action beyond compliance, sectoral approaches, targeted investments and capacity of Multilateral Fund institutions. In the second half-day session, held back-to-back with the 95th meeting, participants had taken a deeper look at unwrapping emerging sectors and interventions beyond standard business. The 12 key takeaways from the first two half-day sessions, as summarized by the Secretariat, were early action; energy efficiency; a sectoral approach; small and medium-sized enterprises (SMEs); institutional capacities; regional centres of excellence; demonstration projects and the enabling environment; end users and the servicing sector; incentives for behavioural change; harnessing market dynamics; broader concepts and approaches; and innovating and maintaining focus. The vision for the present third half-day session was to move the deeper discussion on to forward-thinking Kigali HFC implementation plans (KIPs) and institutional drivers to support KIPs, focusing on the key topics of early action; sectoral approaches; institutional capacities; and end users and the servicing sector.

5. The moderator for the session then took the reins for the presentations and discussion under the two parts of the session.

PART A. Enabling comprehensive and forward-thinking Kigali HFC implementation plans while promoting sustainable cooling

1. How to bridge Kigali HFC implementation plans with national priorities on economic sectors and emerging sectors with HFC consumption growth?

6. To set the scene, representatives of observer organizations made presentations in pre-recorded videos, as follows.

1.1 A multi-faceted implementation strategy related to Montreal Protocol targets

7. Peter Brodribb, Managing Director, Expert Group, recommended that emerging economies adopt a multifaceted strategy for implementation of the Montreal Protocol that included the collection of robust data on the refrigeration and air-conditioning (RAC) industry; the promotion of high-efficiency, low-emission technologies that were market-ready and simple to deploy; and investment in skills development where advanced systems required competent installation and maintenance. Evidence-based policymaking began with accurate data, and the mapping of HFC use across sectors allowed countries to set targeted, realistic, cost-effective, phase-down strategies, including sector-specific strategies, that were aligned both with environmental and economic priorities. He said that the control of the consumption of refrigerants with high global-warming potential (GWP) should not be treated as a standalone goal, but should instead be embedded within a broader strategy to reduce both direct and indirect emissions. For example, a simple requirement in the RAC sector that there be doors on all types of refrigerated display cases would lead to a reduction in equipment size, less cooling and less refrigerant and energy use. He also stressed the value of early action in high-impact sectors, such as the cold chain.

1.2 Emerging cooling demand for data centres

8. Xianting Li, Head of Building Science and Technology Department, Tsinghua University, recalled that data centres were the core infrastructure for data storage, artificial intelligence, cloud computing and the metaverse. The number of data centres was growing rapidly, especially in developing countries, leading to more energy consumption for cooling systems and more carbon emissions. The selection of the cooling technology for data centres depended on the power intensity, the economy and the climate. When the power intensity was low, air cooling with natural cooling and high-performance chillers was a cheap and

energy-efficient option. When the power intensity was high, air cooling was no longer able to meet the heat dissipation demand, and liquid cooling was the preferred choice. Among the three kinds of liquid cooling, cold-plate liquid cooling was regarded as an affordable and energy-efficient cooling method. Immersion liquid cooling was expensive, but preferred if the intensity was very high. Mr. Li said that developing countries should pay more attention to natural cooling and high performance. Operation and maintenance also need attention, and the use of qualified contractors is crucial.

1.3 Discussion

9. Before launching the discussion, the moderator invited Laura Estela Berón (Argentina), Philippe Chemouny (Canada) and Azra Rogović-Grubić (Bosnia and Herzegovina) to deliver brief remarks.

10. In her statement, Ms. Berón said that, while the standard approach to consumption reduction in the servicing sector, which involved training, certification and the delivery of tools, had been successful to date, that approach was not appropriate for the two major sub-sectors that remained to be to addressed in the last stage of the HPMP for her country, namely refrigeration in the approximately 16,000 supermarkets and in the fishing industry with a fleet of over 700 fishing vessels, with some 1,300 metric tonnes of HCFC-22 still to be phased out. She was of the view that a different approach was required, and her country was not sure how to proceed. She highlighted the positive impact of demonstration pilot projects in her region in the past and proposed that new and different approaches and financing modalities were needed for dealing with big subsectors. Finally, she highlighted her concern about the lack of availability of low-GWP alternatives in the servicing sector and urged non-Article 5 counties to work harder with their own producers to ensure their availability.

11. Mr. Chemouny spoke of the food cold chain and highlighted the challenges faced by many developing countries in ensuring sustainable food production and distribution. He thus proposed that the phase-down of HFCs be integrated into countries' strategies to adapt to changing climate conditions. It was necessary to make links to the broader economic and development agenda, which was still many countries' main priority. The Multilateral Fund could act as a catalyst to help the countries to work out the best way to integrate cooling solutions within the broader agenda of ensuring sustainable food production and distribution. Although the Fund was too small to make large strategic investments in technological solutions, it could act as a catalyst to stimulate the synergies that were needed with the adaptation agenda so that countries are able to leverage and mobilize additional funding for more energy-efficient and low-GWP solutions.

12. Ms. Rogović-Grubić spoke of her country's position as a European Union candidate country and thus its need not only to comply with the provisions of the Montreal Protocol but also to fulfil its European Union obligations. Because of that, her country had taken steps beyond those required under the Kigali Amendment, favouring a more holistic approach. This had included developing special data collection and using analytical tools like the HFC Outlook and the Cold Chain Database models to enhance collaboration between the climate and cooling sectors, which had led to the cooling sector being included in her country's nationally determined contribution under the Paris Agreement. The country was also looking to tap into climate-related financial windows and was building synergies with other relevant multilateral environmental agreements. Ms. Rogović-Grubić provided some examples of the market-driven penetration of low-GWP or natural-gas alternative technologies in her country, including in supermarket chains, but said that there was more to be done on recovery and recycling. She also noted the effect of the country's administrative complexity on efforts to ensure that all stakeholders were involved in processes such as certification.

13. In the ensuing discussion, some members talked about insufficient access to alternatives, with one of them stating that technology developing countries should work with technology receiving countries to ensure market uptake and availability. He proposed enhanced regional coordination to that end. One member proposed that the issue be discussed at regional network meetings organized by the UNEP Compliance Assistance Programme, while another requested related training.

14. Some members underscored the importance of high-quality data, with one pointing that data collection was not a one-off event for the development of a plan, but an ongoing process that facilitated sector management and the targeting of policy interventions.

15. There was some discussion of the potential role of the Multilateral Fund in supporting countries in the field of sustainable cooling. Several members saw a catalytic role for the Fund, including for the leveraging of additional financing, acknowledging that the Fund was too small to meet all the financial needs of Article 5 parties in terms of enhancing energy efficiency. One member saw the revolving fund for end users established by the Executive Committee at its 95th meeting as an example of such a role. Members proposed a variety of roles for the Secretariat, some of which also related to action that was not required for compliance but deemed crucial to achieve sustainable cooling. Their proposals included the provision of support for projects to develop better design practices and to promote passive cooling techniques, with a view to ensuring long-term sustainability for SMEs in the cooling sector; the provision of guidance for countries in preparing for and dealing with emerging challenges; and the provision of support for well-conceived demonstration projects to encourage the sector to move forward in particular way or move to a particular alternative.

16. One member stressed the need to transform the KIP from a purely environmental endeavour to an economic and development concern that offered investment opportunities. Some members stressed the need to focus on emerging subsectors, such as data centres. One of them underscored the need for further research in the field, providing some detail on the cost and benefits of some liquid cooling technologies, while another pointed out the difficulties that small countries had in conducting research and development. Another stressed the importance of early interaction with such sectors.

2. How to best engage end users and inspire innovation in the servicing sector?

17. To set the scene, a representative of an observer organization made a presentation in a pre-recorded video, as follows.

2.1 Inspiring digitalization in the servicing sector

18. Blanca Gomez, Director of the National Confederation of Installers and Maintenance Workers of Spain, said that digitalization, automation and artificial intelligence (AI) were transforming heating, ventilation and air conditioning and refrigeration systems, with smart controllers and sensors now enabling remote monitoring, automatic fault detection and predictive maintenance, thereby improving installer efficiency and lowering system owners' costs. Real-time data supported technician decision-making and augmented reality guided service calls, while virtual reality was cutting training time in half and improving learning retention. AI was optimizing building performance by adjusting systems based on actual use. Such tools were essential to bridging the gap between a shortage of skilled labour and rising demand for efficient low-emission systems. The Kigali Amendment could drive a digital transformation across the servicing sector through support for mobile leak tracking and service log platforms, creation of open access training applications in local languages, funding of field projects that tested remote monitoring and AI tools, backing of low-cost augmented reality applications and inclusion of a digital component in Kigali-supported projects.

2.2 Discussion

19. Before launching the discussion, the moderator invited Aditya Narayan Singh (India) and Irene Papst (Germany) to deliver brief remarks.

20. Mr. Singh spoke about engaging end users, primarily commercial and institutional building owners and individual customers, who were the main drivers of demand in the RAC service sector and thus played a key role in the choice of technology. Engaging end users was crucial for optimizing equipment efficiency during operation, reducing environmental impact and enhancing customer satisfaction. The key challenges

were lack of awareness of energy-efficient low-GWP technologies; an inadequate supply chain for alternative equipment, including lack of access to testing and accreditation laboratories; and limited funding options for end-user awareness-raising and adoption of best practices by service technicians. Consequently, technology and supply chain development should be supported through the provision of cost-effective outreach programmes for end users. Training packages, incentive programmes and innovative financial instruments should also be developed to enhance the ability of servicing technicians to handle energy-efficient, low-GWP refrigerants, equipment and components. End-user co-financing was a further challenge. He recommended that a Multilateral Fund window be created for servicing sector projects to support end-user awareness-raising, behaviour change and maintenance practices, as well as handling of refrigerants from end-of-life equipment.

21. Ms. Papst focused her remarks on innovation in the servicing sector, noting that, beyond new technologies, preventive maintenance was important, as it kept systems tight, reduced servicing demand and maintained energy efficiency. Good servicing practices were also needed to avoid refrigerant loss and recover refrigerants for further use. Those aspects depended on individual service technicians, however, most of whom were primarily motivated by economic survival. A business case was needed to shift the focus away from the near-term cost. Effecting change would require a systems approach that placed the individual technician within the context of an implementable policy framework involving the known building blocks: technician training and certification obligations for regular leak checking; equipment owner accountability for leakage; and reporting on refrigerant amounts used in servicing and accounting for losses via a mass-balance approach. A good start would be to develop, possibly with Multilateral Fund support, basic applications, for instance, to support refrigerant tracking based on individual cylinders. Applications could be used to track preventive maintenance activities; several countries had introduced systems that tracked compliance on leakage checking, for instance. That could then be combined with illustrating the benefits of preventive maintenance, providing further motivation for equipment owners.

22. The ensuing discussion primarily revolved around certification. One member stressed the importance of certification given the risks linked with the use of flammable and high-pressure refrigerants. Several spoke about their national certification schemes or more general efforts to encourage the use of certified service technicians. One pointed out that there was an ISO standard, 22712, on "refrigeration systems and heat pumps – competence of personnel", which her country used as the basis for its certification scheme. She also stressed that certification, as well as preventive maintenance and leakage checks, needed to be enshrined in legislation, although even that was not sufficient if there was no disposal system in place. Another member said that even mandatory certification was not enough, and that an enforcement system was essential; in his country, few people had been certified until the government introduced a strict enforcement system that limited selling and buying of refrigerant to the certified technicians, as well as an electronic system that controlled the import, selling and the consumption of refrigerants.

23. One member noted that certification required technicians to have a set of tools, and certification therefore created an opportunity to provide technicians in the informal sector with tools and bring them into the formal sector. A representative of an observer echoed that point, underscoring that certification served both environmental and economic objectives.

24. A member raised the issue of differentiating between competency-based and noncompetency-based certification and the need to ensure that competency-based certification provided an edge in the market. Another member suggested that having a sector-split or competency-split certification system was one way to add value to the certified technician. The need for renewing/rechecking the certified technicians every number of years was also highlighted.

25. One member said that, as the largest user of servicing in the country, his government promoted the use of certified technicians by engaging only certified technicians via its procurement portal, which could be expected to have an impact that would percolate down to the individual consumer. Another member spoke about a United Nations Environment Programme (UNEP) regional programme that assessed trainers, with

the goal of ensuring that trainers in the region were all using the same training module in ASEAN countries, providing for technician migration across borders.

26. Members also spoke about the importance of end-user awareness-raising, including in connection with certification, with two members noting that development of a certification scheme in itself helped to make end users aware of the need to use certified technician. Several other members also acknowledged the importance of educating end users. One recommended using language that spoke to the end-user's interests. Another highlighted the key role of RAC associations in influencing end-user behaviour as well as enhancing energy efficiency in the servicing sector, and recommended that the Multilateral Fund support close collaboration between national ozone units (NOUs) and RAC associations.

27. There was some discussion on efforts to encourage end users to buy more efficient equipment through the use of a star-level system. Some members suggested that equipment star ratings could not be relied on because performance also depended on proper installation and maintenance. One member suggested that a simpler approach would be to lean toward preventive measures and simply introduce minimum energy performance standards.

28. One member noted that end-user awareness was particularly important because enforcement of servicing was impossible, there being no way to ensure whether the work was properly done in the field. His country was planning to use AI technology that permitted the consumer to rate the technician, thus giving the technician the incentive to do a good job.

PART B. Institutional drivers to support Kigali HFC implementation plans along with sustainable cooling and energy efficiency

29. To set the scene, a representative of an observer organization made a presentation in a pre-recorded video, as follows.

1.1 Why refrigeration matters

30. Yosr Allouche, Director General of the International Institute of Refrigeration, stressed the importance of a coordinated and structured national approach to refrigeration, given rapidly rising demand across the sector and the large global workforce that it mobilized. About 20 per cent of global electricity consumption was used by the refrigeration equipment. The sector was complex, covering multiple domains such as refrigerants, energy efficiency and environmental policies, but it was often not well structured at the national level and lacked clear ownership. She lauded the Montreal Protocol model for building sustained national mechanisms, such as the NOUs, noting that the valuable experience already gained could be leveraged to establish or strengthen broader refrigeration governance frameworks. Such a governance set-up should include all national actors, and its structure should reflect national needs in its mix of government bodies, industry, research and training institutions, national representatives and international organisations. Finally, Ms. Allouche highlighted a recent publication by International Institute of Refrigeration about the role of refrigeration in the global economy, challenges and opportunities in which participants could find more information.

1.2 Discussion

31. Before launching the discussion, the moderator invited Hassan Ali Mubarak (Bahrain) and Sandrine Benard (Norway) to deliver brief remarks.

32. Mr. Mubarak stressed the need to create institutional links between cooling and other critical sectors such as urban planning, food security or digital governance. The tools and policy frameworks needed for communication with the other sectors were lacking, however, as the focus of the Montreal Protocol on controlled substances was not always compatible with the priorities of those other sectors. He stressed the

need to include economic and development goals in KIPs, establish coordination mechanisms and build the technical capacities of local partners, institutions and the private sector. It was essential that parties had to have the right institutional and policy tools to leverage the potential that the Kigali Amendment could bring to a variety of economic sectors in their countries.

33. Ms. Benard highlighted the challenges faced by her country when planning, designing and implementing legislation related to HFC phase-down, energy efficiency and safety issues as the process touched complex web of ministries and the agencies under their responsibility. It took time to coordinate and to involve the right people at different levels. It also took effort to keep the collaboration alive and effective when came the time for the new legislation to be implemented. Initiatives such as the Global Cooling Pledge, however, had served to reignite interest in collaboration on the matter. Ms. Benard said that industry and professional associations played a key role in her country as an effective information channel between the policymakers, the enterprises and the technicians on the ground and in capacity-building, training and certification. The associations also regularly organized meetings that brought together individuals in the research industry, in servicing assembly and in sales, from the supplier to the end user, thereby encouraging the sector to be forward thinking and develop innovate solutions. She also stressed the value of prominent research and development environment to enable technical knowledge and demonstrating feasibility of new technologies.

34. In the ensuing discussion, one member said that the Multilateral Fund had a role to play not only in strengthening the capacity of the NOUs in terms of cooling and energy efficiency but conversely also in explaining to bodies under other line ministries about energy efficiency in the context of the Montreal Protocol. It would be most effective if the various stakeholders were able to exchange all together in a holistic manner. The member also proposed that the Multilateral Fund reinforce the capacities of the implementing and bilateral agencies to develop projects according to countries' national circumstances. The representative of an implementing agency proposed that if an energy efficiency authority had yet to be created in a country, the relevant responsibilities could be added to the mandate of an appropriate existing institution.

35. One member stressed the importance of ensuring that training courses and best practices were up to date, in line with modern needs and reflected the evolution of issues over time, as well as new ways of working using mobile technology and AI

36. Another member stressed the importance of laboratory capacities for testing the efficiency of refrigeration equipment and ensuring that minimum energy performance standards were being enforced. The use of laboratory facilities at national standards organizations could be looked into, and if existing facilities were insufficient, perhaps the Multilateral Fund could finance their upgrade.

37. One member advocated exploring the untapped potential of passive cooling, noting that doing so would require wide cooperation within a country.

38. Another member asked for support in setting up a regulatory framework for certification and proposed that the Multilateral Fund produce related guidelines. The representative of an observer organization drew attention to the publication *Fit for Green Cooling* by GIZ Proklima, which aimed to assist countries in establishing a solid qualification, certification and registration framework. Another member stressed the importance of adapting to national circumstances.

39. Other points emphasized by members included the importance of industry associations, especially for knowledge dissemination; the importance of supporting research institutions; the need to support the production of hydrocarbon refrigerants; the importance of looking beyond pure compliance to sustainability for SMEs; the effectiveness of regional collaboration, especially for countries with small markets; and lifecycle refrigeration management.

WRAP UP AND CLOSURE OF THE MEETING

40. To wrap up the discussion, the moderator highlighted some key points that emerged from the discussion including holistic approach, high-quality data, collaboration, end-user awareness, training and certification, the Multilateral Fund as a catalyst, access to alternatives and technologies, engagement of associations and the sustainability of SMEs.

41. In closing, the Secretariat thanked the moderator and participants and mentioned that the session report will be issued as an information document at the 96th meeting while an addendum to document 96/63 will be issued for consideration under the respective agenda item at the 96th meeting.