

## **Institutional Processes – Online Forum Submission, EIA October 2022**

After the illegal production and use of CFC-11 was identified in 2018, Parties to the Montreal Protocol were quick to respond, initiating a variety of studies to examine the Protocol's institutions and mechanisms to better understand how to avoid similar situations in the future. This has highlighted a broad set of shortcomings which must be addressed and new challenges that will arise as the Protocol takes on additional HFC controls.<sup>1</sup>

These have been considered for several years now at meetings of the Montreal Protocol including the Executive Committee to the Multilateral Fund and the Implementation Committee.

At OEWG44 in July 2022, the Parties met again to informally discuss areas for improvement to strengthen the effective implementation and enforcement of the Montreal Protocol, producing a list for further discussion at MOP34 of topical "issues of interest", each with specific subitems.<sup>2</sup> These issues of interest include illegal trade and production, licensing systems, interpretation issues, products, capacity-building, trade through free trade zones and the Implementation Committee.

Each issue of interest is populated with specific subitems that may require their own separate discussion. For example, under illegal trade and production, specific sub-items include definitions, feedstock uses, stockpiling, HS codes, mislabelling and quota systems, each of which require consideration.

The Parties must now decide on a structured time-bound way forward. EIA recommends that the Parties form a contact group at MoP34 to organise and refine the list of issues of interest into key elements to be addressed under a comprehensive review of the institutions and processes of the Montreal Protocol.

These elements should include:

- atmospheric monitoring
- reporting and monitoring
- compliance mechanism
- capacity building and finance
- exempt uses and emerging issues
- illegal trade and enforcement.

The items currently listed under 'overarching thoughts and challenges' in Annex V to the Note by the Secretariat can be developed to form a set of guiding principles to contextualise and inform the discussion and any resulting processes.

A decision at MoP34 setting a roadmap for consideration of each element and the related subitems over the coming years would allow the Parties to consult internally and externally in advance and to come prepared to exchange views and proposals on needed improvements. In support, the Secretariat could be charged with compiling the available background information to inform the discussion, including on horizontal issues, such as proportionality to expected benefits as well as the costs and burdens of any new recommended measures.

The overarching goal should be to strengthen the effectiveness of the Protocol's monitoring, reporting, verification and enforcement mechanisms to sustain the achievements of the Montreal Protocol and meet the new challenges of the HFC phase-down, securing its standing as the most successful multilateral environmental agreement.

The following outlines EIA's views and rationale for additional items to be added to the discussion, organised under the six key elements previously recommended.

## Guiding principles for the discussion

Include from current list:

- Montreal Protocol institutions, including the Implementation Committee already work well
- This item provides an opportunity to improve sharing of information and best practices
- Opportunities to improve reporting
- New actions should apply to all Parties
- New measures should be proportionate to expected benefit
- The cost and burden of any new measures should be considered
- Parties should consider the differences between legal obligations as a Montreal Protocol Party and compliance with domestic law

Additional items:

- The HFC phase-down under the Kigali Amendment brings additional challenges that have been absent from the ODS phase-outs.

Rationale:

The HFC phase-down is novel in several ways. For example, it is a phase-down not a phase-out, with four separate phase-down schedules rather than two phase-out schedules. The CO<sub>2</sub>eq metric brings added complexities, not least due to the much larger number of pure HFC chemicals and proliferation of HFC blends with varying GWPs. The RTOC 2018 Assessment Report identified over 100 refrigerant blends containing HFCs and HFOs.<sup>3</sup> The May 2022 TEAP progress report notes that since that report, 18 new refrigerant blends have received an ASHRAE or ISO designation.<sup>4</sup> These blends are used in multiple applications with a wide range of emissions factors, making it much more complex to accurately estimate bottom-up expected emissions and therefore detect potential discrepancies in the observed atmospheric levels. Finally, A5 Parties are undertaking the HFC phase-down simultaneously with the HCFC phase-out, which brings unique challenges to these Parties. It is therefore important that these issues are taken into consideration in the discussion.

## 1. Monitoring atmospheric emissions

A growing number of scientific studies are sounding the alarms about a throng of synthetic chemicals linked to industrial sources being emitted into the atmosphere at levels that are unexpected, unexplained, or poorly understood, with implications for climate and ozone protection under the Montreal Protocol. The importance of comprehensive atmospheric monitoring at a global and regional level cannot be overstated.

This workstream would include work under Decision XXXIII/4, which agreed to explore options for enhancing the global and regional atmospheric monitoring of controlled substances.

## 2. Reporting and monitoring

Include from list:

- Licensing systems
  - Trade and transfer of licenses
- Products
  - Pre-blended polyols
- Illegal trade and production
  - Improving quota system

Additional items:

- Review of licensing systems, previous recommendations and potential minimum requirements
- QR codes, blockchain technologies
- Reporting of HFOs used in HFC blends
- Separate reporting of isomers
- Article 9 reporting

Rationale:

The Parties have adopted guidance on licensing systems, e.g. *Decision VII/9*, *Decision VIII/26* and *Decision IX/8*, but have not outlined minimum requirements or modalities for the implementation and operation of a licensing system, such as a requirement for prior notification and consent or the use of certain technologies. The Ozone Secretariat currently does not link all licensing systems or produce general guidelines.<sup>5</sup> Licensing systems have a key role to play in curbing ‘front door’ smuggling of HFCs. While sophisticated smuggling methods involving tactics like false labelling and clever concealment will always pose a challenge to enforcement agents, lessons can be learned from the experience of the EU in the first years of the EU F-Gas Regulation, where significant quantities of HFCs were sent directly to unlicensed importers due to the failure of its licensing system.<sup>6</sup> New features to prevent illegal trade are under consideration in the EU and the US, for example tracking and real-time monitoring.<sup>7</sup>

HFOs are commonly used in lower-GWP HFC/HFO blends, therefore more information is required to understand the production, consumption and trade in HFOs in order to monitor compliance with the HFC phase-down and identify discrepancies that are early indicators of illegal activity. Similarly, separate reporting of isomers may assist in addressing bottom-up, top-down discrepancies.

A review of the latest scientific findings demonstrates a shocking array of new chemical emissions, equivalent to hundreds of millions of tonnes of carbon-dioxide equivalent emissions each year. The 2022 Scientific Assessment of Ozone Depletion draws attention to unexplained emissions of CFCs-13, 112a, 113a, 114a, 115, carbon tetrachloride (CCl<sub>4</sub>, CTC) and HFC-23, attributing emissions to feedstocks, by-products or unknown sources.<sup>8</sup>

Under Article 9 of the Montreal Protocol, Parties are required to “promote research, development and exchange of information on possible alternatives to controlled substances, to products containing such substances and to products manufactured with them; and costs and benefit of relevant control strategies.”

Parties are required to submit a summary of the activities it has conducted in this regard every two years, which could provide valuable information on strategies to reduce reliance on ODS as feedstocks. However, over the past 10 years only a handful of countries have submitted these reports, and none of the major fluorochemical producing countries.<sup>9</sup>

### **3. Compliance mechanism**

Include from list:

- Illegal trade and production
  - Currently no definition
- Interpretation issues
  - HFC23 emissions: interpretation of obligations
- Implementation Committee
  - Role and processes
  - How to identify issues to be considered by the Implementation Committee?
  - Periodic examination of systemic issues of non-compliance
- Illegal trade and production
  - Sustaining compliance after phase-out period

Additional items:

- Monitoring, reporting and verification
- Review of non-compliance procedure

Rationale:

Given that the production and use of significant quantities of illegal CFC-11 persisted for many years with no detection from current monitoring, reporting and verification (MRV), a thorough review of the entire non-compliance procedure is warranted, it should not be narrowly focused on the Implementation Committee.

### **4. Finance and capacity building**

Include from list:

- Capacity building / information sharing on best practices and experiences

- Training for enforcement and customs officers
- How can cooperation be better facilitated?
- Do we need to work more on strengthening processes?

Additional items:

- Disincentives to report / seize controlled substances
- Detection equipment
- HFC tracking / real-time monitoring systems

Rationale:

The costs associated with seizing, storing and destroying unwanted ODS and HFCs can be considerable. The logistics of transporting these chemicals to facilities can be complicated if a country has no domestic facilities. This acts as a deterrent to customs to seize illegal imports, and many countries simply re-export seized goods. While this may be appropriate in some cases, there are clear cases where illegal imports should be seized and destroyed, for example in the case of persistent offenders or where there are questions over the quality of the refrigerants. Given the plethora of HFC blends, it is important that countries are equipped with adequate technology to detect the HFC species.

Additionally, the means of identifying and preventing illegal trade may be aided by more robust tracking and monitoring systems and technologies. Countries with fewer resources for robust domestic tracking systems may benefit from additional support to implement such measures domestically.

## 6. Illegal trade / Enforcement

Include from list:

- Trade through free trade zones
- Illegal trade and production
  - Currently no definition
  - Effective implementation of Advanced Cargo Information (ACI)
  - Mislabeling
  - HS codes for HFCs

Additional items:

- Global ban on disposable cylinders
- Role of [iPIC](#)
- Transit control procedures
- Best practice for dealing with seizures of controlled substances
- Information sharing

Rationale:

The vast majority of known ODS smuggling cases are facilitated by the use of disposable cylinders (sometimes referred to a “non-refillable containers”), as their disposable nature means they can be freely traded.<sup>10</sup> *Decision XIX/12* states that Parties “wishing to improve implementation and enforcement of their licensing systems in order to combat illegal trade more effectively may wish to consider implementing domestically on a voluntary basis the following measures: ... [b]anning or controlling the use of non-refillable containers.”<sup>11</sup>

Disposable cylinders are specifically-manufactured ‘one-way’ containers charged with refrigerant, sold, used for servicing or commissioning equipment and then discarded. Aside from the additional waste management issues this brings, the cylinders result in a residual quantity of refrigerant, or ‘heel’, being emitted to the atmosphere as they must be cut or punctured before entering the waste stream. If the cylinders do not enter the formal waste stream the heel remains until the container degrades and is ultimately released. According to the 2010 RTOC assessment the vapor heel represents about 3% of refrigerant charge, and the liquid heel represents between 5 and 8%.<sup>12</sup>

The EU banned disposable refrigerant cylinders in the EU and on EU flagged vessels in 2007. Similar bans are also in place in Canada, India and Australia. However, disposable refrigerant cylinders are still in wide use elsewhere in the world and the European market has been flooded with illegal HFCs in disposable cylinders.<sup>13</sup>

As the HFC phasedown regime progresses, new methods for smuggling or otherwise concealing illegal trade will emerge. Regular information sharing among Parties will be critical to national enforcement efforts to identify and clamp down on illegal trade before it becomes widespread.

## 5. Exempt uses and emerging issues

Include from list:

- Management of feedstock uses, exemption uses and stockpiling

Additional items:

- Intermediate products
- By-products
- Sustainability of alternatives to controlled substances

In 2020, global production of ODS that have been “phased out” amounted to more than half a million tonnes.<sup>14</sup> The recent Scientific Assessment Panel (SAP) assessment notes that the current combined GWP-weighted emissions of CFCs plus HCFCs are comparable to those of HFCs.<sup>15</sup> A significant proportion of these emissions are from use of controlled substances as feedstocks or are by-products in those processes.

The definition of production under the Montreal Protocol has excluded feedstocks due to the assumption that, as raw materials, feedstocks are converted to other products, except for *de minimis* residues and emissions of unconverted raw material.<sup>16</sup> Decision IV/12 exempted only “insignificant quantities” from its definition of controlled substances and urged Parties to “take steps to minimize emissions of such substances, including such steps as avoidance of the creation of such emissions, reduction of emissions using practicable control technologies or process changes, containment or destruction.” Despite this, scientists are increasingly raising concerns that reported emissions from feedstock processes are underestimated and may account for significant elevated global atmospheric levels of a number of greenhouse gases, including CTC, CFC-113, HFC-23 and PFC-318.

Parties are required to report the production of controlled substances for feedstock uses annually, however there are considerable problems with reporting. The 2022 TEAP Progress Report lists common feedstock applications of controlled substances, but TEAP acknowledges that it does not have an exhaustive list as Parties do not report how controlled substances are used, processes are proprietary and there is no official source to define the manufacturing routes followed and their efficacy.<sup>17</sup>

Moreover, some products are not reported because they are intermediates and not isolated in a chemical manufacturing process. These intermediates are however being emitted and detected by atmospheric monitoring. The 2022 TEAP Progress Report lists a large number of high-volume chemical products that may be produced by non-isolated controlled substance intermediates and are not reported, including CFC-11, CFC-112, CFC-114 and multiple HCFC and HFC species.<sup>18</sup>

Since the phase-out of ODS began more than 30 years ago, the key sectors relying on ODS have undergone several transitions – from CFCs to HCFCs to HFCs. The Kigali Amendment is now spurring the uptake of fourth generation fluorinated refrigerants, HFOs. While HFOs have been designed to have low direct GWPs, HFOs and HFO-HFC blends are linked to serious environmental concerns including trifluoroacetic acid (TFA), per- and polyfluorinated alkyl substances (PFAS) and high greenhouse gas emissions.<sup>19</sup> There are also concerns over high-GWP alternatives to methyl bromide, such as sulfuryl fluoride (SO<sub>2</sub>F<sub>2</sub> GWP 4630) while high-GWP HFC alternatives to HCFCs continue to be placed on developing country markets by companies headquartered in developed countries, despite the Kigali Amendment.

## Conclusions

The SAP estimates that the current combined GWP-weighted emissions of CFCs plus HCFCs are comparable to those of HFCs.<sup>20</sup> Direct industrial emissions of greenhouse gases and ODS related to fluorochemical production

amount to many hundreds of millions of CO<sub>2</sub>-eq tonnes each year. The Montreal Protocol is clearly the most relevant institution to address this chemical climate bomb.

The climate crisis dictates an urgent need to tackle unexpected and new emissions from the fluorochemical industry and advance the conversation on strengthening institutional processes to ensure the sustainability of the Montreal Protocol's achievements to date and to rise to new challenges.

## References

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- <sup>1</sup> Montreal Protocol Ozone Secretariat (2019). Unexpected emissions of CFC-11: update to the overview provided at the forty-first meeting of the Open-ended Working Group UNEP/OzL.Pro.31/6. Available [here](#).
- <sup>2</sup> United Nations Environment Programme (5 August 2022). *Report of the forty-Fourth Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer*. UNEP/OzL.Pro.WG.1/44/4. Paragraphs 46-56 and Annex II(B). Available [here](#).
- <sup>3</sup> RTOC 2018 Assessment Report, p55-50. Available [here](#)
- <sup>4</sup> TEAP Progress Report – Volume 1, May 2022, p13. Available [here](#)
- <sup>5</sup> UNEP/OzL.Pro/ImpCom/63/6, Paragraphs 35-36.
- <sup>6</sup> EIA (2019) Doors Wide Open: Europe's flourishing illegal trade in hydrofluorocarbons (HFCs). Available [here](#)
- <sup>7</sup> See EU Proposal for Revision of the EU F-Gas Regulation, available [here](#) and EIA (2022) Preventing Illegal Trade of HFCs: AIM Fact Sheet. Available [here](#)
- <sup>8</sup> World Meteorological Organization (WMO). Executive Summary. *Scientific Assessment of Ozone Depletion: 2022*, GAW Report No. 278, 56 pp.; WMO: Geneva, 2022
- <sup>9</sup> Based on a review of reports submitted by the Secretariat to the Meeting of the Parties
- <sup>10</sup> EIA, UNEP (2011) Risk Assessment of Illegal Trade in HCFCs. Available [here](#)
- <sup>11</sup> Decision XIX/12: Preventing Illegal Trade in Ozone-Depleting Substances, para (3)(e).
- <sup>12</sup> RTOC (February 2011). 2010 Report of the Refrigeration, Air Conditioning and Heat Pumps Technical Options Committee. 2010 Assessment Report. *UNEP*. Available [here](#).
- <sup>13</sup> Disposables may contain dangerous mix. (25 August 2018). *Cooling Post*. Available [here](#)
- <sup>14</sup> Annex XII: Reported production of phased-out substances (tonnes). UNEP/OzL.Pro.34/6-UNEP/OzL.Pro/ImpCom/69/2
- <sup>15</sup> World Meteorological Organization (WMO). Executive Summary. *Scientific Assessment of Ozone Depletion: 2022*, GAW Report No. 278, 56 pp.; WMO: Geneva, 2022
- <sup>16</sup> UNEP Briefing note on exemption mechanisms. Available [here](#)
- <sup>17</sup> TEAP Progress Report – Volume 1, May 2022, p54
- <sup>18</sup> TEAP Progress Report – Volume 1, May 2022, Table 6.1 p53
- <sup>19</sup> Kauffeld & Dudita (2021). Environmental impact of HFO refrigerants & alternatives for the future. Available [here](#)
- <sup>20</sup> World Meteorological Organization (WMO). Executive Summary. *Scientific Assessment of Ozone Depletion: 2022*, GAW Report No. 278, 56 pp.; WMO: Geneva, 2022