2022 High-Level Political Forum on Sustainable Development

Building back better from the coronavirus disease (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development:

Contributions from the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer

Introduction

The Secretariat for the Vienna Convention on the Protection of the Ozone Layer, and its Montreal Protocol on Substances that Deplete the Ozone Layer (Ozone Secretariat), submits this report to the 2022 High-Level Political Forum on Sustainable Development (HLPF), in response to the invitation from the President of the United Nations Economic and Social Council, Mr Collen Vixen Kelapile.

The report outlines the work carried out under the Vienna Convention and the Montreal Protocol up to the end of 2021, around the theme of 2022 High-level Political Forum *"Building back better from the coronavirus disease (COVID-19) while advancing the full implementation of the 2030 Agenda for Sustainable Development"*. It highlights the relevant contribution of the ozone treaties to the Sustainable Development Goals (SDG) under in-depth review by HLPF in 2022, namely SDG 4 on quality education, SDG 5 on gender equality, SDG 14 on life below water, SDG 15 on life on land, and SDG 17 on partnerships for the Goals.

About the Vienna Convention and the Montreal Protocol

The 1985 Vienna Convention for the Protection of the Ozone Layer (Vienna Convention) and its 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) were established to protect human health and the environment from the threat of ozone depletion. Both treaties have achieved universal ratification with 198 parties. The Vienna Convention calls on parties to cooperate on scientific research and observations. The Montreal Protocol controls 96 manufactured ozone-depleting substances (ODSs) plus their isomers, most of which are also potent greenhouse gases. To date, the global implementation of the Montreal Protocol has led to the phase-out of 99 per cent of ODSs, or 1.8 million Ozone Depletion Potential tonnes, globally[1]. The remaining 1 per cent (approximately 200,000-300,000 metric tonnes) is largely hydrochlorofluorocarbons (HCFCs). Global phase-out of these substances is expected by 2030. The 2016 Kigali Amendment to the Montreal Protocol, which entered into force on 1 January 2019, added 18 hydrofluorocarbons (HFCs) to the list of controlled substances. While HFCs do not destroy ozone, they are potent greenhouse gases. Stemming from the Kigali Amendment, parties place an emphasis on the importance of pursuing energy efficiency and sustainability of equipment in refrigeration and air-conditioning sectors while phasing down HFCs.

Ozone Treaties and SDGs

Before providing an account of our specific inputs to the SDGs in question, we want to draw attention to table 1 below which indicate the SDGs to which the work under the ozone treaties contributes. It is also important to note that by mitigating damaging effects of ultra-violet (UV) radiation from stratospheric ozone depletion the Vienna Convention and Montreal Protocol help maintain the health of the planet on which the achievement of all sustainable development objectives ultimately depends.

[1] Bases on annual ODS production and consumption data submitted by parties under Article 7 of the Montreal Protocol https://ozone.unep.org/countries/data-table

MONTREAL PROTOCOL CONTRIBUTIONS TO THE GOALS	SUSTAINABLE DEVELOPMENT GOALS														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17
Universal ratification										√						√
Partnerships with all stakeholders at all levels																√
Funding to all developing countries	√							√	√	√		√	√			√
Increased investment in green alternatives									√			√				
Technology and knowledge transfer	√							√	√	√		√	√			√
Promoting the use of greener, safer chemicals									√			√				
Promoting technology innovation								√	√	√		√	√			√
Institutional strengthening and capacity building	√								√	√		√				√
Promoting science education and gender mainstr.				√	√											√
Promoting food security and greener economy	√	√									√	√			√	
Avoided damage to crops, fisheries and materials	√	√									√	√		√	√	
Protection from UV radiation			√								√			√	√	
Avoided diseases (skin cancers and eye cataracts)			√													
Energy efficiency enhancements							√				√	√	√			
Climate change mitigation											√	√	√			

Table 1: Schematic overview of how the Ozone Treaties contribute to SDGs. Goals of relevance for the current input are in purple[2].

Reporting to the HLPF 2022

Our inputs to this report draw from the ongoing work of the parties at the international and national level; the findings of the three Assessment Panels of the Montreal Protocol, based on assessment of a wide array of scientific disciplines relevant to the Montreal Protocol; and the work of the Ozone Secretariat. In the second year of the pandemic and despite the associated travel and other restrictions, the Vienna Convention and Montreal Protocol continued their work holding global online consultations and negotiations with the active participation of government officials and other stakeholders of the Vienna Convention and the Montreal Protocol.

The present report highlights the contribution of the ozone treaties to SDGs 4, 5, 14, 15 and 17, under the subheadings of the template provided by the President of ECOSOC.

(a) Progress, experience, lessons learned, challenges and impacts of the COVID-19 pandemic on the implementation of SDGs 4, 5, 14, 15 and 17 from the vantage point of your intergovernmental body, bearing in mind the three dimensions of sustainable development and the interlinkages across the SDGs and targets, including policy implications of their synergies and trade-offs:

Promoting the popular scientific understanding of the ozone layer and climate science has always been considered important under the Vienna Convention and the Montreal Protocol. One activity in this respect implemented by parties at the national level is the integration and mainstreaming of science into the national curricula for primary and secondary education. Agencies involved in the implementation of the Montreal Protocol and the Ozone Secretariat have provided outreach support and readily available educational material to parties for this purpose. In January 2022, the Ozone Secretariat launched an education platform crafted by education experts. The first phase targets 8-12-year-olds with secondary school material to follow in Phase II. Available free online, the dynamic and interactive online teacher and student resources aim to help create engaging learner experiences centred around the importance of science and the power of collaboration to overcome global environmental challenges. The platform follows the release of short animation series and a mobile game called Reset Earth in 2021 to raise awareness and inspire action among young people about the importance of the ozone layer, and the continued need to protect it.

[2] Goal 16 is not directly linked to the ozone treaties' work

The Kigali Amendment has been ratified by 129 parties to date, of which 91 are developing countries operating under Article 5 of the Montreal Protocol (hereafter referred to as Article 5 parties). The phase-down of HFCs necessitates transition to low-global warming alternatives which represent operational challenges. These substances are widely used in a variety of sectors of the economy, mainly in the refrigeration, air-conditioning and heat pump sector (RACHP), hereafter referred to as the cooling sector for ease of reference. While most of these alternatives are more environmentally friendly by not being ozone-depleting and not warming the planet, some are either flammable, toxic or operate under high pressure. This makes their adoption challenging especially in the context of Article 5 parties where the refrigeration and air-conditioning servicing sector that deals with the installation, repair and maintenance of this equipment is not always sufficiently prepared to safely handle those alternative refrigerants. In many countries of the global south, the servicing sector also tends to be dominated by micro, small and medium enterprises many of which are in the informal sector. The safe introduction of alternative refrigerants may require structural changes in existing systems for the national certification and skills frameworks as well as additional training and relevant education.

The parties to the Montreal Protocol are engaging with stakeholders from national Technical and Vocational Education and Training (TVET) systems to integrate good and safe service practices and mandatory certification for servicing technicians for handling flammable substances. Article 5 parties are eligible for financial support from the Multilateral Fund for the Implementation of the Montreal Protocol and technical support from implementing agencies[3] who work with, inter alia, the cooling servicing sector to provide regular capacity building and training on good and safe servicing practices, distribution of servicing tools, and upgrading training facilities at TVET training centres. Many parties have already successfully undertaken necessary changes in their TVET systems to produce the right skills for the changing cooling market. Their experience and lessons learned serve as a useful example to undertake similar processes in other Article 5 parties.

During training, gender mainstreaming efforts are applied with the intention of removing barriers and providing incentives for increased participation of women in this traditionally male-dominated trade. Parties are increasingly prioritizing gender mainstreaming while implementing policies, projects, and activities under the Montreal Protocol. The Multilateral Fund of the Montreal Protocol has produced and has been systematically applying the gender mainstreaming guide to the projects it funds. Implementing and bilateral agencies have also produced their own internal policies and guides to ensure gender mainstreaming in the design and implementation of projects.

The Ozone Secretariat actively highlights the role of women in science, research and development, in fields where women are under-represented, e.g. science, technology, engineering, and mathematics (STEM). The Ozone Secretariat marked the International Day of Women and Girls in Science and International Women Day in 2021 to raise the visibility of women scientists and policy-makers in the ozone regime. UNEP, through its OzonAction programme as an implementing agency under the Montreal Protocol, launched a global survey in 2021 'Women in RACHP' to assess the existing gaps in the background, motivation, challenges and opportunities faced by women in this sector. The results will help inform decision-makers to enhance women participation. In 2019, UNEP OzonAction issues the first-of-its-kind publication entitled "Women in Refrigeration & Air-Conditioning Industry", with over 100 stories from 50 countries that shared inspiring experiences and success stories of women from this field and presented lessons learned from their career paths.

[3] UNDP, UNIDO, UNEP, World Bank and bilateral agencies from individual donor parties

In 2022, the World Refrigeration Day, celebrated annually on 26 June, is themed under STEM to support women in STEM to shine as visible role models and inspire young people through fun, interactive online STEM sessions.

The activities mentioned in above paragraphs directly contribute to **SDGs 4 and 5**.

In its 2021 update to the Thirty-third Meeting of Parties in 2021, the Environmental Effect Assessment Panel[4] highlighted the following contribution of the Montreal Protocol to the SDGs, specifically **goals 14 and 15**. Changes in UV radiation over the earth on average, have been small over the past 2 decades indicating the successful implementation of the Montreal Protocol. Furthermore, a recent paper published in Nature[5] supports the significance of the Montreal Protocol acting as a carbon sink and co-benefiting climate action. The study estimates that without the Protocol and control of ozone-depleting substances by all parties, UV-B radiation would have increased by around 400% during the 21st century, leading to a decrease of 325–690 billion tonnes of carbon held in plants by the end of the century and an additional 115–235 parts per million of carbon dioxide entering the atmosphere. Without the Montreal Protocol, this increased emission of carbon dioxide would have led to an additional rise in global mean surface temperature of 0.5–1.0 °C.

Concerning SDG 17, during the course of 2021 the Parties of both the Vienna Convention and Montreal Protocol met in a total of 11 global online meetings formally, to consider, and finally adopt, 18 decisions at the combined twelfth meeting of the Conference of Parties to the Vienna Convention and the Thirty-Third Meeting of Parties of the Montreal Protocol[6]. The combined meeting addressed several issues of importance for the continuing implementation and operation of the Protocol. This included the interim replenishment of the Multilateral Fund for the implementation of the Montreal Protocol to continue operations and provide financial and technical assistance to 147 Article 5 parties, including the preparation of the national Kigali Amendment implementation plans**.** Other decisions aimed to ensure sustained compliance by all parties with their obligations with the Montreal Protocol and continued implementation of the Vienna Convention provisions. These contribute to SDG 17 and directly to its targets **(target 17.1-17.4, 17.7-17.9, 17.9-17.11, 17-13-17.18)**.

The data on the state of the ozone layer and the presence of controlled substances in the atmosphere come from continuous satellite and ground-based observations and records from 1978 to date. The Ozone Research Managers[7] considered the issue of atmospheric monitoring and stressed its importance not only to monitor the state of the Earth's protective shield against harmful ultraviolet rays but also to better understand its interactions with changing climate and to monitor the controlled substances. In its 11th meeting held online in 2020 and 2021, the Ozone Research Managers reviewed ongoing national and international research and monitoring programmes to ensure proper coordination, and identify and address existing gaps, noting the need for more resources for ground-based stations around the world for early detection of increased atmospheric concentrations and their emission sources, as well as independent analyses of results. This requires considerable sustained funding and strong international cooperation and capacity development. The recommendations to strengthen the scientific capacity in

[4] The Environmental Effect Assessment Panel is one of the scientific panels under the Montreal Protocol informing parties of regular scientific developments in understanding the effects of the ultraviolet radiation from stratospheric ozone depletion on life on Earth including human health, biosphere, and ecosystems services and the interactions of these effects with climate change.

[5] https://www.nature.com/articles/s41586-021-03737-3

[6] The combined meeting took place online on 23-29 October 2021.

[7] The Ozone Research Managers is the scientific forum of the Vienna Convention comprised of government atmospheric research managers and scientists.

developing countries and regions and ensure that science continues to underpin the decision-making by the parties, were later adopted by the Conference of the Parties.

Enhancing global atmospheric monitoring and global capacity to monitor the state of the ozone layer and emissions of the controlled substances has direct relevance for **SDG 14, SDG 15 and specifically SDG 17.16, 17.18 and 17.9.**

(b) Assessment of the situation regarding the principle of "leaving no one behind" against the background of the COVID-19 pandemic and for the implementation of the 2030 Agenda, within the respective areas addressed by your intergovernmental body:

Leaving no one behind is an underlying principle enshrined in the design and operation of the Vienna Convention and its Montreal Protocol, universally ratified multilateral environmental agreements. Every party implements the Montreal Protocol, and the rate of compliance is 99.6 %[8]. The summary provided under question (a) is relevant for this section too, in terms of specific contributions to the SDGs under review during this year's HLPF. Outlined below are the two specific areas of the ozone treaties that we would like to highlight.

Enshrined in the Montreal Protocol is the equity and capacity for all countries to participate in the global phase-out of controlled substances which led to the establishment in 1991 of the Multilateral Fund which supports 148 countries, mainly developing countries, operating under Article 5 of the Protocol. The Fund is replenished every 3 years through contributions of 50 parties (developed countries) based on a careful projection of the needs of Article 5 parties for their national implementation activities. Given the continued restrictions to hold in-person meetings, in 2021 an interim decision was taken by parties to enable the donor parties to continue making contributions to the Fund (similarly to 2020 as reported in our submission last year). As the result, the Executive Committee of the Multilateral Fund continued its operation and at its 85th to 87th meetings held in 2020 and 2021, approved funding of USD$ 104 million for 394 projects in 126 Article 5 parties focusing on industry conversions, technology transfer, capacity building, and institutional strengthening.

In addition, measurable reduction targets for the production and consumption of controlled substances established under the Montreal Protocol take into consideration the circumstances of all countries, especially the needs of developing countries. The year 2020 was a significant milestone for the Protocol as the parties operating under Article 5 had to achieve a 35% reduction in the production and consumption of HCFCs, in line with the control measures of the Montreal Protocol. As reported at the last Meeting of the Parties, parties to the Protocol reported their annual data on consumption and production of controlled substances for 2020, confirming their sustained compliance with their obligations.

Parties' compliance with the reduction targets protects the ozone layer and help avoid profound environmental changes, changes that otherwise would threaten human health, food security, and ecosystems on which all life on Earth depends. The world-avoided environmental impacts from severe ozone layer depletion and increased UV radiation because of the Montreal Protocol, positively impact the potential for sustainable human development embodied in the SDGs.

(c) Actions and policy recommendations in areas requiring urgent attention in relation to the implementation of the SDGs under review:

[8] Based on annual national data on production and consumption of controlled substances submitted by parties under Article 7 of the Montreal Protocol for 2020 https://ozone.unep.org/countries/data

In 2020-2021 the parties to the Montreal Protocol agreed to postpone the more complex discussions on the final level of the Multilateral Fund's replenishment of the 2021-2023 triennium to the next meeting in 2022. It is anticipated that this will allow the parties to deliberate in a face-to-face (or hybrid) meeting of the Montreal Protocol being organized. Resolving the issue of replenishment is a priority for 2022 in order to address the ongoing phase-out of ozone-depleting substances, in tandem with the concurrent preparation for HFC phase-down by 91 Article 5 parties to the Kigali Amendment. As such, the continued funding of the Montreal Protocol implementation is paramount for the sustained recovery of the ozone layer, and associated climate benefits as outlined above.

During the last combined Conference of Parties and Meeting of Parties in 2021, the Protocol's Scientific Assessment Panel informed the parties that the 2021 Antarctic ozone hole was the 13th largest on record but noted that this was due to severe weather conditions and that without the Montreal Protocol, it would have been larger still. This underscores the importance of monitoring to ensure the Protocol's continued effectiveness.

The Ozone Research Managers (ORM), as the main scientific forum of the Vienna convention, identified gaps in the global coverage of atmospheric monitoring, particularly around the globe such as in Africa and South America. The lack of comprehensive coverages makes such gaps make early detection and warning more difficult, potentially undermining global progress in the ozone layer recovery and the capacity to undertake collective corrective actions. Parties to the Vienna Convention acknowledged this by adopting the recommendations of the ORM to improve monitoring in underserved regions and strengthen current monitoring capacity. This will also ensure that the Vienna Convention can continue to have a significant positive impact through collated research and systematic observations of the ozone layer, and information exchange.

(d) Policy recommendations, commitments, and cooperation measures for promoting a sustainable, resilient, and inclusive recovery from the pandemic while advancing the full implementation of the 2030 Agenda:

The Montreal Protocol implementation affects a sizeable part of the economy which includes cooling sector. Cooling cuts across various areas including food systems, cities and built environment, transportation, healthcare, tourism, and many others. To demonstrate the impact of the Montreal Protocol in the reduction of food waste and loss, food security and other related SDGs, the Ozone Secretariat partnered with the government of Italy and various organization and initiatives, such as the United Nations Food and Agriculture Organization and the Cool Coalition to promote the Rome Declaration on sustainable cold chains in the runup to the United Nations Food Systems Summited held in September 2021. An international dialogue on sustainable cold chains was hosted by the Government of Italy with a total of 20 organizations from government, farmer and industry associations and international organizations participating as speakers. The discussions stressed the importance of scaling up technological and policy solutions for cold chains, including enhanced international cooperation among relevant stakeholders at all levels.

In addition, the Ozone Secretariat jointly with the OzonAction programme of UNEP, launched a virtual exhibition on sustainable cold chains showcasing state-of-the-art solutions to cold chains including game-changing system approaches for both food security and wider vaccine access. The exhibition targets mainly the private sector, designers and providers of technological solutions that meet the triple criteria of zero ozone depleting, low-global warming refrigerants with enhanced energy efficiency. It also showcases game-changing approaches to cold chains. The virtual exhibition was launched in September 2021 and will be running throughout 2022 accepting cold chain solutions on a rolling basis. These are

examples of commitments and cooperation that can provide concrete solutions within the cooling sector that can contribute to a sustainable and inclusive recovery from the pandemic.

Numerous studies reviewed by the Technology and Economic Assessment Panel (TEAP) indicate that the cooling sector consumed 20% of electricity produced globally in 2019, and the demand for refrigeration and air-conditioning units will increase significantly in the next few decades. In addition, new emerging technology such as heat pumps used for space heating, also reliant on refrigerants controlled by the Montreal Protocol, is seen as a possible low carbon solution to climate change and air pollution in cities. Demand for such equipment is likely to grow as governments put in place stricter policy measures to abate fossil-fuel emissions from heating.

The review of energy-efficient and low-global warming potential technologies, conducted by TEAP and presented to parties in 2021, indicate that if cooling consumes excessive energy, and continues to use high global-warming potential (GWP) refrigerants, this will contribute to warming that surpasses the 1.5°C targets already by 2030. The review identifies a variety of existing best available technologies and solutions, but their adoption and implementation need to be urgent. The transition to new more efficient technologies also needs to be well-coordinated to avoid dumping of old and inefficient ones in countries, a concern that was raised by some parties to the Protocol and discussed by the parties at their last Meeting in 2021. The consideration of the matter has been postponed to future meetings to allow for more careful deliberations.

As outlined above, strengthening global cooperation to promote, enhance and employ sustainable cooling solutions and energy efficiency is a key element in the better and greener recovery from the pandemic.

Finally, given the potential of the Kigali Amendment to make a significant contribution to climate change mitigation, it is imperative to promote its ratification to ultimately achieve universal ratification to enable global a phase-down of HFCs, one of the greenhouse gases under the scope of the Paris Agreement.

(e) Key messages for inclusion into the Ministerial Declaration of the 2022 HLPF:

In view of the issues discussed in the report, a key message from the Montreal Protocol is **the importance of zero-ozone depleting, low-global warming potential, safe and energy-efficient cooling** for a sustainable, resilient, and inclusive recovery after the pandemic with a view to achieving the sustainable development goals. The phase-down of HFCs under the Kigali Amendment to the Montreal Protocol integrated with enhanced energy efficiency has the potential of making a significant contribution to the achievement of the Paris Agreement targets. The **continued implementation of and compliance with the Montreal Protocol including its Kigali Amendment, through concerted efforts, broad-based partnership and fit-for-purpose solutions at all levels will be critical to reap the full climate and sustainable development benefits of the global ozone protection regime**.