

Sustainable and resilient recovery from the COVID-19 pandemic that promotes the economic, social and environmental dimensions of sustainable development: building an inclusive and effective path for the achievement of the 2030 Agenda in the context of the decade of action and delivery for sustainable development:

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

Introduction

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 99 manufactured ozone-depleting substances (ODSs), most of which are also potent greenhouse gases. To date, the global implementation of the Montreal Protocol has led to the phase-out of 98.6 per cent of ODSs, or 1.75 million Ozone Depletion Potential tonnes, globally. The remaining 1.4 per cent (approximately 385,000 metric tonnes) is hydrochlorofluorocarbons (HCFCs), with the commitment from developing countries to achieve full phase-out of these substances by 2030. The 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. Thus, the HFC phase-down under the Kigali Amendment will make a significant contribution to mitigating climate change.

The Secretariat for the Vienna Convention and its Montreal Protocol submits this report to the 2021 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 Munit Akram.

The report follows the template provided in the letter of invitation. It presents the views of the Secretariat stemming from the work of the parties to the Vienna Convention and the Montreal Protocol up to the end of 2020, around the theme of 2021 High-level Political Forum *"Sustainable and resilient recovery from the COVID-19 pandemic that promotes the economic, social and environmental dimensions of sustainable development: building an inclusive and effective path for the achievement of the 2030 Agenda in the context of the decade of action and delivery for sustainable development"*.

The report attempts to highlight the contributions of the ozone treaties, as the world recovers from the pandemic and builds back its societies. It describes the contribution of the ozone treaties to Sustainable Development Goals (SDG) under the in-depth review by HLPF in 2021, namely SGD 1 on no poverty, 2 on zero hunger, 3 on good health and well-being, 8 on decent work and economic growth, 10 on reduced inequalities, 12 on responsible consumption and production, 13 on climate action, 16 on peace, justice and strong institutions, and 17 on partnerships, taking into account an integrated, indivisible and interlinked nature of the SDGs. Goal 16 is not directly linked to the ozone treaties' work and so will not be mentioned in this report.

Before providing an account of our specific inputs to the SDGs in question, it is useful to see the general overview of how the ozone treaties, through their work, contribute to the implementation and achievement of Agenda 2030 and SDGs.

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

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

In the last couple of years, the world has experienced some extreme or abnormal events such as an unusually small Antarctic ozone hole in 2019, an extensive and prolonged depletion of both Arctic and Antarctic ozone in 2020 during their respective springtime, record-setting temperatures around the world, heatwaves, droughts, devastating wildfires, and an unprecedented number of tropical/subtropical cyclones. Moreover, the ongoing COVID-19 pandemic has claimed more than 1.8 million human lives as of December 2020 and inflicted economic hardship on millions of people worldwide, with the potential to significantly disrupt the progress made towards the achievement of the Agenda 2030 for Sustainable Development. Our inputs to this report are built on the findings from a wide array of scientific disciplines contributing to the Montreal Protocol's assessment panels and draws from the ongoing work of the parties. Despite the pandemic and lockdown situation, the Vienna Convention and Montreal Protocol continued its work holding global online consultations and negotiations with the active participation of government officials and other stakeholders. The present report highlights the Montreal Protocol's importance in mitigating many of the potentially damaging effects of increases in solar UV radiation from stratospheric ozone depletion as well as climate change. In today's rapidly changing world, the Ozone treaties continue to play a critical role in protecting human health and the environment and thus contribute to many of the SDG targets established in the 2030 Agenda for Sustainable Development.

(a) Impacts of the COVID-19 pandemic on the implementation of the SDGs under review in the 2021 HLPF from the vantage point of your intergovernmental body, bearing in mind the interlinkages with other SDGs

During the COVID-19 pandemic that posed restrictions on large gatherings and international travel, the global intergovernmental meetings under the Vienna Convention and Montreal Protocol could not be held in person on a full scale. However, taking advantage of technological opportunities and with careful preparations, the Secretariat held a number of online meetings in 2020 to enable parties to review, negotiate and take decisions on key operational items. The meetings included the 42nd meeting of the Open-Ended Working Group in July, part I of the 11th meeting of the Ozone Research Managers in October, informal meetings on the budgets of the Trust Funds of the Vienna Convention and the Montreal Protocol in early November, and the 12th Conference of Parties (part I), and the 32nd Meeting of Parties in November 2020. The first global, virtual, intergovernmental meeting of the governing bodies of the ozone treaties resulted in the adoption of 14 decisions, which enabled the implementation and operation of both treaties to be maintained. Some other important decisions had to be deferred for discussion in 2021 when in-person meeting become possible, enabling more effective multilateral

diplomacy. The continued implementation and operation of the ozone treaties and the convening of the Meeting of Parties and Conference of Parties that took key decisions, has relevance to SDG 3, SDG 13 and SDG 17.

One important decision concerns the replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol for the next 2021-2023 triennium. The Multilateral Fund was established by parties to support the transition out of ODSs in countries operating under paragraph 1 of Article 5 of the Protocol (mainly developing countries) that are eligible for financial assistance. There are 147 Article 5 countries. The Fund finances projects focusing on industry conversions, technology transfer, capacity building, and institutional strengthening, thus enabling these parties' compliance with the provisions of the Montreal Protocol. The Multilateral Fund is replenished every 3 years, based on a careful projection of the needs of Article 5 parties for their national phase-out activities. Such projections are developed by a special task force under the Technical and Economic Assessment Panel (TEAP) of the Montreal Protocol. Face-to-face interaction and negotiations among parties are crucial for the approval of the replenishment amount. Parties could not take a decision on it in 2020 but adopted an interim budget in order to continue the operation of the Fund in 2021 including providing funding to projects in Article 5 countries. The final decision is expected to be taken this year. The fact that disruption has been avoided to the operation of the Multilateral Fund and, in turn, to the ongoing phase-out activities under the Protocol has direct relevance for SDG 3, SDG 8, SDG 12 and SDG 13.

As of December 2020, the contributions received by the Fund from donor countries totalled over US\$4.1 billion. The Fund has also received additional voluntary contributions amounting to US\$25.5 million to finance fast-start activities for the implementation of the Kigali Amendment. Due to the pandemic, the bi-annual meetings of the Executive Committee of the Multilateral Fund were replaced by the online inter-sessional project approval mechanism. This way, the Committee could approve projects amounting to about 87 million US dollars for the phase-out of ODSs and for institutional strengthening projects in more than 50 developing countries. The approval of the projects was important for continued momentum and the sustainability of the ongoing phase-out activities.

At the operational level, many countries have experienced delays in the delivery of previously approved projects due to the pandemic. Nevertheless, all parties seem to have managed to sustain their compliance with the reduction targets for the ODSs as provided for in the Montreal Protocol. The 2020 consumption and production data that parties will officially report to the Ozone Secretariat¹ in 2021 is expected to confirm this. The continued compliance has direct relevance for SDG 8, SDG 12 and SDG 13.

At the Thirty-First Meeting of the Parties, held in Rome in 2019, many parties endorsed the Rome Declaration on the Contribution of the Montreal Protocol to Food Loss Reduction through Sustainable Cold Chain Development. The Declaration has direct relevance to implementing the 2030 Agenda for Sustainable Development and the achievement of the SDGs related to, *inter alia*, ending hunger and poverty, food security, improved nutrition, climate action, sustainable agriculture and fisheries, and health and well-being. Up to date, 82 parties endorsed the Declaration. The deadline for endorsing the Declaration has been extended for another year to the next meeting of parties in October 2021 to allow more parties to join. Implementation of the actions called for under the Declaration has direct relevance for SDG 1, SDG 2, SDG 3, SDG 13 and SDG 17.

(b) Actions, policy guidance, progress, challenges and areas requiring urgent attention in relation to the SDGs and to the theme within the area under the purview of your intergovernmental body

¹ Online country data portal <https://ozone.unep.org/countries/data>

Having entered into effect globally as of 1 January 2019, the Kigali Amendment to the Montreal Protocol aims to phase down by more than 80% the use of HFCs, potent greenhouse gases widely used in the refrigeration and cooling industry as the replacement for ODSs. The implementation of the Kigali Amendment has the potential to make a significant contribution to climate change mitigation by avoiding estimated emissions of up to 105 GtCO₂-eq by 2050, and global warming by 0.4 C by 2100². Although the process of the national ratification of the Amendment seems to have encountered delays in some countries due to the pandemic situation, 23 more parties ratified the Kigali Amendment since the beginning of 2020, of which 17 are Article 5 countries. As at the end of February 2021, a total of 114 countries ratified the Amendment. As the pandemic eases, parties are expecting to re-energize their ratification processes. It is hoped that eventual universal ratification is achieved so that the full expected climate benefits of the Kigali Amendment may be realized. The implementation of the Kigali Amendment has relevance for SGD 8, SDG 10, SDG 12 and SDG 13.

As mentioned above, the decision on the Multilateral Fund's replenishment for 2021-2023 is expected to be taken this year. A physical meeting of parties and face-to-face negotiations is critical for the parties to agree on replenishment. Should a physical meeting not be possible to convene, the parties would need to find a way forward to continue the funding support to Article 5 parties to ensure the implementation of, and sustained compliance with the Montreal Protocol, which protects the ozone layer and the climate. The year 2020 is a significant milestone for the Protocol as the parties operating under Article 5 are to achieve 35% reduction in the production and consumption of HCFCs in line with the control measures specified in the Montreal Protocol. The compliance with this target will be evaluated in 2021, once parties submit their consumption and production data for 2020. The compliance with the Montreal Protocol obligations and its implementation in 147 Article 5 countries directly relates to SDG 3, SDG 8, SDG 12 and SDG 13.

Parties to the Montreal Protocol have been encouraged to endorse the Rome Declaration on the Contribution of the Montreal Protocol to Food Loss Reduction through Sustainable Cold Chain Development to promote sustainable cold chains as essential for preserving foods and vaccines. The Declaration may be featured in the preparatory process leading up to the United Nations Secretary-General's Food Systems Summit as part of the Decade of Action to achieve the Sustainable Development Goals (SDGs) by 2030. Actions for sustainable cold chains encouraged by the Declaration, for food preservation and reduction in food loss and waste, have direct relevance for SDG 1, SDG 2, SDG 3, SDG 8, SDG 10, SDG 12 and SDG 13.

(c) An assessment of the situation regarding the principle of "ensuring that no one is left behind" at the global, regional and national levels against the background of the COVID-19 pandemic in achieving the 2030 Agenda and the SDGs, within the respective area addressed by your intergovernmental bodies

The Montreal Protocol protects the ozone layer as well as our climate from profound changes that would have threatened human health, food security and ecosystems services on which humans depend. The adverse environmental impacts from severe ozone layer depletion could thus negatively impact socioeconomic development and exacerbate poverty. As the Montreal Protocol protects the planet with its natural capital and humans, it has a fundamental bearing on human development as well as to the principle of 'ensuring that no one is left behind'.

For the past 20 years, changes in UV radiation have been small, because the Montreal Protocol has prevented a continuation of stratospheric ozone depletion. Based on the regular updates provided by

² Facts and figures on ozone protection <https://ozone.unep.org/facts-and-figures-ozone-protection>

the Assessment Panels of the Montreal Protocol³, it is predicted that with continued compliance with the Montreal Protocol targets by all parties, who follow the same objective but in a differentiated way according to their national circumstances, the recovery of the Antarctic ozone hole is expected to gradually return to its 1980 state in the 2060s. Northern hemisphere and mid-latitude ozone will return to 1980 values by the 2030s, while southern Hemisphere mid-latitude ozone will return to 1980 values around mid-century⁴. The ozone layer's health has direct relevance for SDG 1, SDG 2, SDG 3, SDG 10 and SDG 13.

In 2020, the world observed the 12th largest and deepest depletion of the ozone layer in the 40+ year record, which had persisted well into the southern hemisphere's spring. The hole is not evidence of worsening ozone depletion, though, but a result of the unusual weather in the southern hemisphere. The data comes from continuous satellite and ground-based observations and records from 1978 to the present. The Ozone Research Managers⁵ consider the gaps and needs in research and systematic observations of the ozone layer, including interactions between ozone and climate. In its 2020 online meeting, the ozone research managers discussed the regional gaps in atmospheric monitoring of controlled substances and quantification of emissions with the objective of exploring options for improving the situation and filling in such gaps to ensure that the science continues providing the strong underpinning for the decision-making by Parties. In this process, the strengthening of the scientific capacity in developing countries and regions are also considered. Enhancing the capacity to monitor the state of the ozone layer and emissions of the controlled substances has direct relevance for SDG 3, SDG 13 and SDG 17.

Globally, with the Montreal Protocol, up to 2 million cases of skin cancer may be prevented each year by 2030⁶. Updated modelling studies suggest that, due to the Montreal Protocol, millions of cases of skin cancers and cataracts will be avoided among people born between 1890-2100 in the United States alone. At the same time, there is an observed increase in rates of malignant melanoma, which are most likely due to trends in behaviour that have led to greater sun exposure, with changes in stratospheric ozone playing a smaller role. These findings point to the strong sensitivity of skin cancer to increased exposure to UV radiation and the inherent value of protecting the ozone layer. The cumulative estimate is that from 1987 to 2060, the Montreal Protocol will result in an estimated US\$1.8 trillion in global health benefits from avoided diseases and almost US\$460 billion in avoided damages to agriculture, fisheries, and materials. The health improvement and economic estimates from prevented damages have relevance for SDG 1, SDG 2, SDG 3, SDG 8, SDG 9, SDG 10 and SDG 12.

Based on the results from modelling studies⁷, which incorporate data from the atmosphere, oceans, land surface and sea ice, the Montreal Protocol's implementation has prevented global warming of 1°C. By 2050, the Montreal Protocol could avert warming of 1.5°C to 2°C over land areas outside polar regions, and between 3°C and 4°C over the Arctic. The magnitude of the avoided temperature increase due to the provisions of the Kigali Amendment (0.2 to 0.4°C) is substantial in the context of the 2015 Paris Agreement.⁸ In addition, the Kigali Amendment is also stimulating improved energy efficiency in refrigeration and cooling technologies with additional benefits in reduced energy demand and promoting more sustainable consumption practices. The climate co-benefits from implementing the Montreal Protocol have relevance for SDG 1, SDG 2, SDG 12, and SDG 13.

³ Scientific Assessment Panel, the Environmental Effects Assessment Panel and the Technology and Economic Assessment Panel

⁴ Facts and figures on ozone protection <https://ozone.unep.org/facts-and-figures-ozone-protection>

⁵ Scientific forum of the Vienna Convention and Montreal Protocol comprised of government atmospheric research managers and scientists

⁶ Facts and figures on ozone protection <https://ozone.unep.org/facts-and-figures-ozone-protection>

⁷ The 2020 summary report for policy-makers from the Environmental Effects Assessment Panel of the Montreal Protocol

⁸ Facts and figures on ozone protection <https://ozone.unep.org/facts-and-figures-ozone-protection>

(d) Cooperation, measures and commitments at all levels in promoting sustainable and resilient recovery from the COVID-19 pandemic

The Montreal Protocol's phase-out of ODS has driven significant innovation in the various ODS-using sectors. In the cooling sector, innovations have occurred in terms of refrigerant transition and energy efficiency enhancement. The efficiency of refrigerators doubled between 1994 and 2015 and the improved energy efficiency has avoided an increase in power demand equivalent to ten new 500 MW power stations. Even with those energy efficiency improvements, total energy consumption in the refrigeration, air-conditioning and heat pumps sectors account for up to 10 per cent of total global greenhouse gas emissions. This is likely to increase significantly, given the projected growth in demand for refrigeration and air-conditioning devices from 3.6 billion to 9.5 billion by 2050⁹. There is potential to improve energy efficiency as technologies and designs of equipment and systems evolve with the growing need for cooling. It is an opportune time, as governments put in place post COVID-19 recovery plans, to introduce higher energy efficiency targets and other policy incentives in this area. It has been estimated that improving energy efficiency while phasing down HFCs could potentially double the direct climate benefits from the HFC reduction required under the Kigali Amendment. The interventions in area of energy efficiency of the refrigeration and cooling sector have relevance for SDG 8, SDG12 and SDG 13.

Halons, powerful ozone-depleting and greenhouse gases, still play an essential role in civil aviation and maritime shipping industries, two sectors considerably affected by the recent pandemic and associated economic slowdown. While the production and consumption of halons were phased out in 2010, reclaimed and recycled halons can be used in these sectors in fire protection systems due to the lack of suitable alternatives in these specific applications. The quality and availability of the supply of recovered halons have become unpredictable and calls for greater coordination among parties to the Protocol and other MEAs in trade and full recovery of halons to minimize its losses¹⁰, also in collaboration with the International Maritime Organization and the International Civil Aviation Organization. As the COVID recovery plans are being put in place, measures to seek alternative solutions to halons in these two sectors may be strengthened. The situation with halons has relevance to SGD 3, SDG 8, SDG 10, SDG 12 and SDG 13.

In the fight against COVID-19, available vaccines require cold storage systems to ensure their preservation, safe distribution and equal access. As studies show¹¹, robust cold chains for medical needs and vaccines are not evenly available, especially in low and middle-income countries. Within the vaccine rollout strategies, consideration may be given to strengthening and expanding efficient and sustainable cold chain systems that also consider the requirements under the Montreal Protocol and its Kigali Amendment to promote and adopt refrigerant and technology options that are climate friendly. The equitable availability of sustainable cold chains for vaccination has direct relevance for SDG 3, SDG 10 and SDG 13.

(e) Various measures and policy recommendations on building an inclusive and effective path for the achievement of the 2030 Agenda in the context of the decade of action and delivery for sustainable development

The Montreal Protocol is founded on the partnership at all levels. Our 198 parties, developed and developing countries, work together to protect the ozone layer by taking the latest scientific knowledge and advice provided by the three Assessment Panels of the Montreal Protocol and reach consensus-based decisions in a strong spirit of cooperation and compromise. The Protocol's Multilateral Fund,

⁹ 2020 Institute for Governance & Sustainable Development and Centro Mario Molina "Cooling Emissions and Policy Synthesis Report"

¹⁰ Technology and Economic Assessment Panel, May 2020: Progress Report <https://ozone.unep.org/system/files/documents/TEAP-Progress-report-and-response-decXXXI-8-may2020.pdf>

¹¹ 2020, SE4All Briefing note: "Cooling for All: The role of cold chain in delivering a COVID-19 vaccine"

replenished every three years with contributions from developed countries, supports Article 5 countries to meet their Montreal Protocol obligations. Activities and projects are implemented through partnerships, between governments and the implementing agencies (UNDP, UNEP, UNIDO and the World Bank) and bilateral agencies. The implementation at the country level is led by the decisive engagement of different ministries and state agencies and the active involvement of the private sector. The networks of national ozone officers regularly cooperate and exchange ideas and best practices. The partnership is the pillar for the Vienna Convention and Montreal Protocol's success and it is essential in addressing global issues, including the Agenda 2030 guided by its SDG17.

The science-policy interface and science itself are the strengths of the Montreal Protocol. The role of the three Assessment Panels of the Montreal Protocol, constituted by leading scientists and experts from around the world, is to periodically assess the latest information on the science, environmental effects, technology and economics of ozone layer depletion and protection. Those assessment reports inform the parties' policies and decision-making. A recent example is that unexpected emissions of trichlorofluoromethane (CFC-11) were detected by scientists in 2018, parties took immediate action collectively, and now the unexpected emissions have decreased and the emission trend has been restored¹². The incident brought to the spotlight the importance of early warning of problems and early identification of emissions and trends to enable corrective actions that may be needed. Parties are now addressing how the Montreal Protocol may be strengthened, including monitoring controlled substances in the atmosphere, to prevent such occurrences in the future. A strong science base for policies and decision-making and effective international cooperation to solve issues has relevance for SDG 3, SDG 13 and SDG 17.

(f) Key messages for inclusion into the Ministerial Declaration of the 2021 HLPF

Partnership and collaboration: One of the pillars of success of the Montreal Protocol is the partnership and cooperation at all levels. SDG 17 highlights the many ways by which working in partnership is essential to achieving sustainable development and it will be of paramount importance in building a resilient and inclusive post-pandemic world. Provision of necessary assistance to those who need it, be it funding, sustainable technologies, science, or capacity building, among and within countries, need to be considered so that every country may incorporate sustainability into building back better.

Climate action: Sustainability and decarbonization objectives may be incorporated into the economic response packages to ensure that the economy recovers sustainably from the impacts of the pandemic. The compliance with the Montreal Protocol and Kigali Amendment provisions would contribute significantly to this process through the phase-out and phase-down of potent ozone-depleting and greenhouse gases, including and importantly in the cooling sector which becomes increasingly significant as the demand for cooling rises rapidly. In this context, the continued ratification of the Kigali Amendment remains crucial. Its implementation is one of the concrete solutions for the mitigation of climate change that the world has at hand.

¹² Park, S., Western, L.M., Saito, T. et al. A decline in emissions of CFC-11 and related chemicals from eastern China. Nature 590, 433–437 (2021). <https://doi.org/10.1038/s41586-021-03277-w>