



EVERY ACTION COUNTS: KIGALI AMENDMENT

UNEP 2022

Acknowledgements

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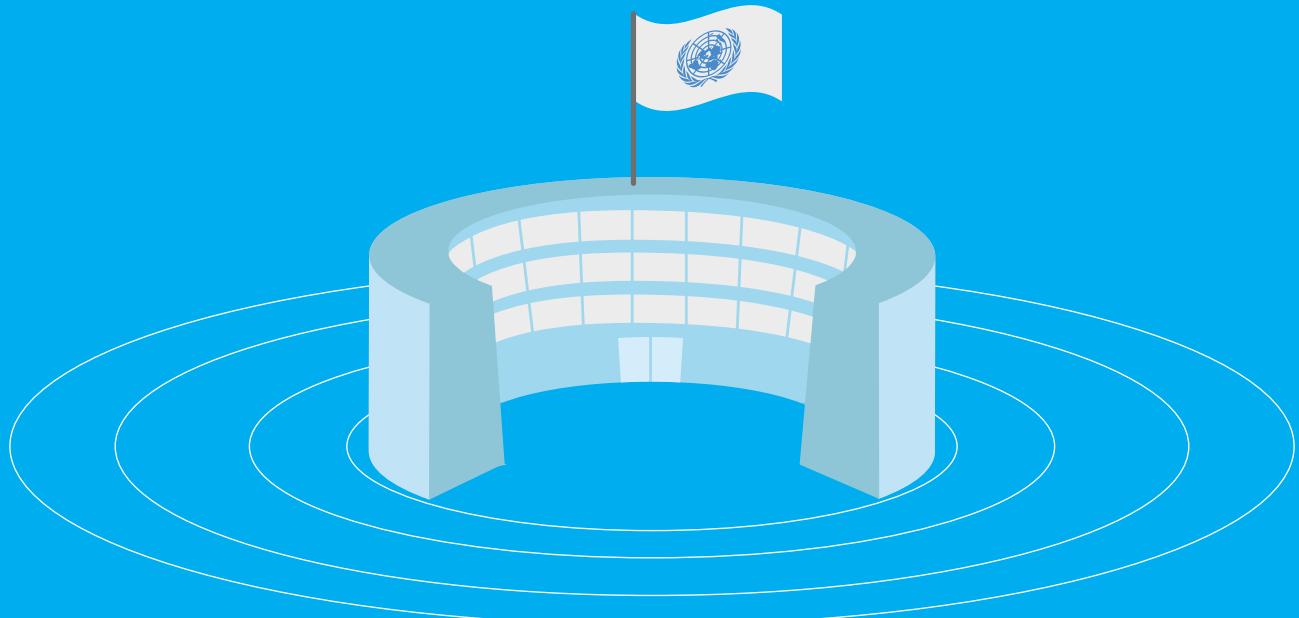
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I. WHO WE ARE

a. Do you know the UN?

The United Nations (UN) is an international organisation founded in 1945, whose missions and work are guided by the purposes and principles of its founding Charter. It is the main world forum where countries can raise questions, discuss complex matters, and arrive at common solutions. Thanks to its role in fostering dialogue and negotiations, the UN has become the mechanism by which governments can reach common ground and solve problems together for issues that transcend national boundaries and cannot be resolved by any one country acting alone.

With a membership of 51 countries at the time of its inception, it is now composed of 193 member states.

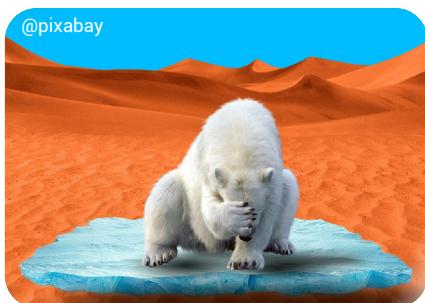
The work of the UN covers five main areas: to maintain international peace and security, protect human rights, deliver humanitarian aid, support sustainable development and climate action, and uphold international law. One of its many goals is the protection of the environment.

b. The UN and the Environment

The UN is particularly concerned with global environmental problems, and seeks solutions to various global issues such as climate change, the depletion of the ozone layer, toxic wastes, the decline of forests and species, air and water pollution, etc.

To this aim, the United Nations Environment Programme (UNEP) was created in 1972. As the leading global authority in the field of the environment, UNEP's mission is to provide leadership and encourage partnerships in caring for the environment, by inspiring, informing and enabling nations and peoples.

UNEP's programme is organised around six strategic domains:



Climate change



Disasters and conflicts



Ecosystems management



Environmental governance



**Harmful substances
and Hazardous Waste**



Resource Efficiency

In 2015, the international community adopted the Paris Agreement under the United Nations Framework Convention on Climate Change, the leading international treaty on climate change. This agreement is also a response to keeping global temperature rise below 2°C and to pursue efforts to limit temperature increase to 1.5°C. The same year, countries adopted the UN 2030 Agenda for Sustainable Development, an action plan for humanity, the planet, and prosperity, which is composed of 17 ambitious goals, each with specific targets to be met by 2030. Both agreements serve to frame the goals and implementation pathways for global cooperation to protect the planet.

SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



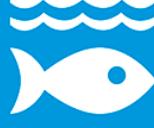
12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



17 PARTNERSHIPS FOR THE GOALS





II. THE MONTREAL PROTOCOL

a. Context

One of the main concerns of the UN is the preservation of our planet and its ecosystems. In this perspective, one of the elements UNEP is specifically dealing with is the protection of the ozone layer.

The ozone layer is a stratospheric layer - 20 to 40 km above sea level - containing a high concentration of ozone. The ozone layer acts as an invisible shield and protects us from harmful ultraviolet (UV) radiation from the sun. It absorbs a large quantity of solar UV radiation and especially **UV-B rays**, which are harmful for living forms. Ultraviolet radiation causes skin cancer, cataracts, suppresses the human immune system, damages agricultural crops and ecosystems, and deteriorates the built environment. In humans, ultraviolet radiation quickly causes sunburn and drying and thickening of the outer layer of the skin, which accelerates skin aging.

By absorbing UV-B in the stratosphere, the ozone layer prevents harmful levels of this radiation from reaching Earth's surface. Therefore, the ozone layer plays an essential part in the Earth's ecosystem and human health.

b. Why a Protocol?

In 1974, Mario J. Molina and F. Sherwood Rowland warned that chlorofluorocarbons (CFCs) catalytically deplete stratospheric ozone. In 1975, Veerabhadran Ramanathan showed that these CFCs are also super-greenhouse gases (GHGs), with each molecule being tens of thousands of times more potent than carbon dioxide (CO₂). By 1978, UNEP organized assessments that built momentum for the 1985 Vienna Convention for Protection of the Ozone Layer (Vienna Convention). Just weeks later, British scientists discovered that the concentration of ozone above the Antarctic continent and other areas of the globe had fallen considerably. Even with normal variations in the ozone layer, a reduction of 50 per cent of the total ozone concentration had been observed in some parts. This catastrophic ozone depletion was soon called the Antarctic Ozone Hole and the public and environmental authorities demanded action to avoid ozone tipping¹ points and environmental and health consequences.

1- A tipping point is a small intervention causing major long-term consequences that are hard to reverse.

To remedy the situation, 24 member states of the UN and the European Commission worked together to design a global cooperative agreement, and on 16 September 1987, they signed the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol).

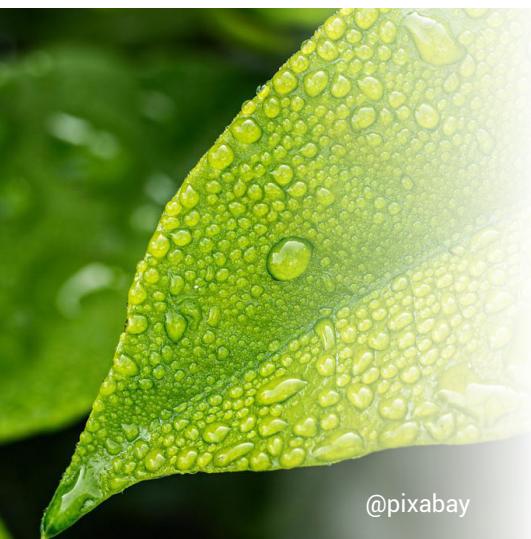
A total of 197 United Nations states and observers are now parties to this agreement. The Vienna Convention and Montreal Protocol were the first, and so far, only one of United Nations treaties on any topic to achieve Universal Ratification.

c. Goals and benefits

The Protocol requires the phase-out of the production and consumption of almost 100 manufactured chemical substances that deplete the ozone layer. These chemical substances are called Ozone Depleting Substances (ODS). In some instances, specific uses of certain ODS have been temporarily exempted from controls, and nitrous oxide (N₂O), which is an ozone-depleting GHG, is not yet controlled under the Montreal Protocol. Controlled ODSs include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbons (HBFCs), halons, methyl bromide, carbon tetrachloride, and methyl chloroform. Alternatives to these substances have been found and adopted for virtually all uses. However, 15% of alternatives used to replace ODS were hydrofluorocarbons (HFCs), which do not deplete ozone layer but have a high global warming potential (GWP) and thus contribute to climate warming. To correct this, the Parties to the Montreal Protocol endorsed in October 2016 the Kigali Amendment, which introduced an HFC phase-down to the treaty's control measures.

Over 99% of the controlled ODS have now been phased out, allowing a gradual recovery of the ozone layer. According to the Scientific Assessment Panel, the ozone hole will have significantly decreased by 2050 and recovery is foreseen between 2060 and 2070.

Thanks to the Montreal Protocol, the ozone hole observed in 2019 was the smallest on record since its discovery. Moreover, this environmental Protocol has had multiple benefits in various other fields:



Benefits for the Environment

The recovery of the ozone layer enables the preservation of the planet's ecosystem balance, thus allowing the survival of animal and plant species particularly sensitive to UV-B radiation. The benefits for biodiversity arising from the Protocol are significant and provide correlated social and economic benefits.



Benefits for the Climate

ODS not only harm the ozone layer but are also powerful greenhouse gases. Consequently, the efforts to phase out ODS have avoided warming that otherwise would equal what is caused by carbon dioxide. This makes the Montreal Protocol the strongest mandatory treaty to address climate change. By repairing the stratospheric ozone layer, the treaty also provided additional climate benefits by protecting forests and other natural sinks that remove greenhouse gases.



Benefits for Humankind

Humankind is a clear beneficiary of the Montreal Protocol through improved health and food security. UV-B rays are harmful for humans, as they are the main cause of serious illnesses like skin cancers, cataracts, and suppression of the human immune system. Solutions provided by the Montreal Protocol that restore the ozone layer and curb global warming will allow better yields and healthier crops, which enhances food security, and helps build climate resilience. By slowing climate impacts, the Montreal Protocol also supports peace and security as it helps to prevent hunger, water scarcity, population displacement, and many of the underlying causes of global conflict.

The Montreal Protocol's success stems from a pragmatic approach that addresses the production and consumption of the offending factory-made chemicals, relies on information from real-time scientific and technical assessment panels, and promotes equity in the delivery of finance and technology to ensure the effective participation of developing countries. It provides a model for multilateral cooperation.



Benefits for the Economy

The Montreal Protocol has provided solutions to environmental issues which threatened the viability of markets and economies. Indeed, the degradation of the environment depletes the natural "capital" that humanity's survival and growth depend upon.

The mandatory phase-out of ODS driven by the Montreal Protocol, which could have disrupted the viability of many businesses in a wide variety of sectors, instead spurred the development of environmentally friendlier alternative substances and systems. The Protocol has a robust approach for sharing technology and knowledge, with a careful appreciation of the special circumstances of developing countries. Throughout its history, replacements for ODS have been more energy efficient, less damaging to climate and the environment, and more affordable.

III. THE KIGALI AMENDMENT

a. Why this name?

Amendment is the term used for a substantive change made to a UN agreement, in this case the Montreal Protocol. When an amendment is approved, the parties agree to adopt a new mandatory requirement. Since the Montreal Protocol was agreed in 1987, there have been five amendments to the Protocol, the latest being the Kigali Amendment in 2016. Kigali is the name of the capital city of Rwanda which hosted the meeting where Parties to the Protocol agreed to the Amendment. The Kigali Amendment to the Montreal Protocol added HFCs to the list of controlled chemicals, after countries reached consensus to approve an amendment.

b. What is the Kigali Amendment?

The Kigali Amendment modifies the Montreal Protocol by adding HFCs to the list of controlled substances, because they are harmful for the environment due to their strong global warming impact, which is higher than CO₂ per molecule. It came into force on 1 January 2019 and obligates countries to phase down the amount of HFC gases produced and consumed by 80% or more.

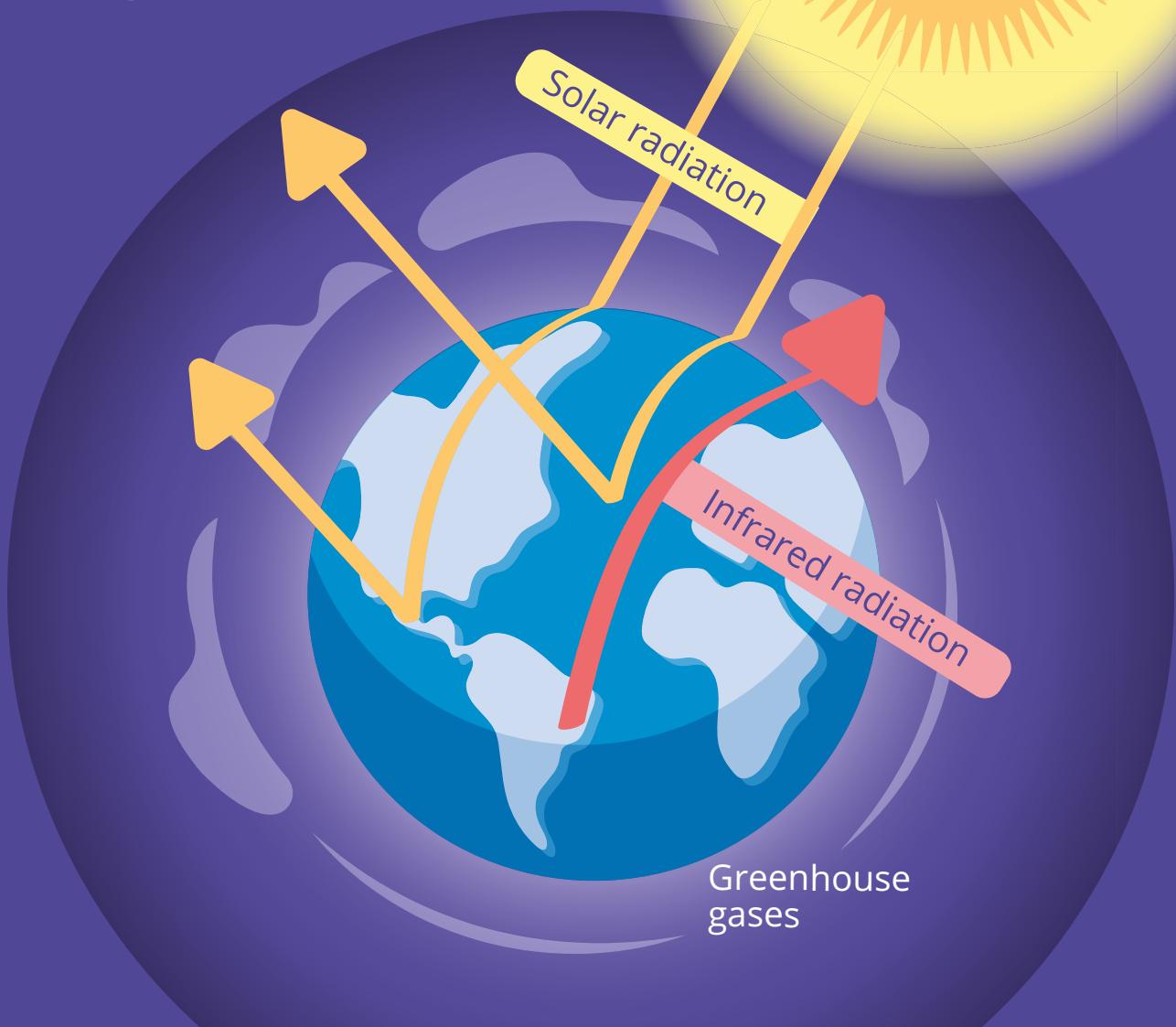
While HFCs are powerful climate pollutants, they do not destroy stratospheric ozone and were developed as a quick replacement for HCFCs, which were being phased out under the Protocol. But great strides are being made with technologies that are safer to the environment and often more affordable than HFCs, which will enable their phase-down and replacement.

c. What are the consequences of the use of HFCs?

While HFCs do not deplete the ozone layer, they are potent [greenhouse gases](#). The greenhouse effect is a natural phenomenon which retains the heat the Earth receives from the Sun, like a blanket wrapped around the planet. It protects us from the deep cold of outer space and helps maintain an average temperature of 15°C on our planet, instead of -18°C! But excess man-made greenhouse gases disrupt the Earth's natural balance, leading to, temperature rise and associated climate impacts such as sea level rise, flooding, droughts, extreme weather events, and other worsening climate impacts.

HFCs are not present in the atmosphere in large quantities and their lifespan is rather short (up to fifteen years) but their warming potential is thousands of times higher than that of CO₂. That is why the Kigali Amendment aims at phasing down their consumption and production.

Greenhouse Gases



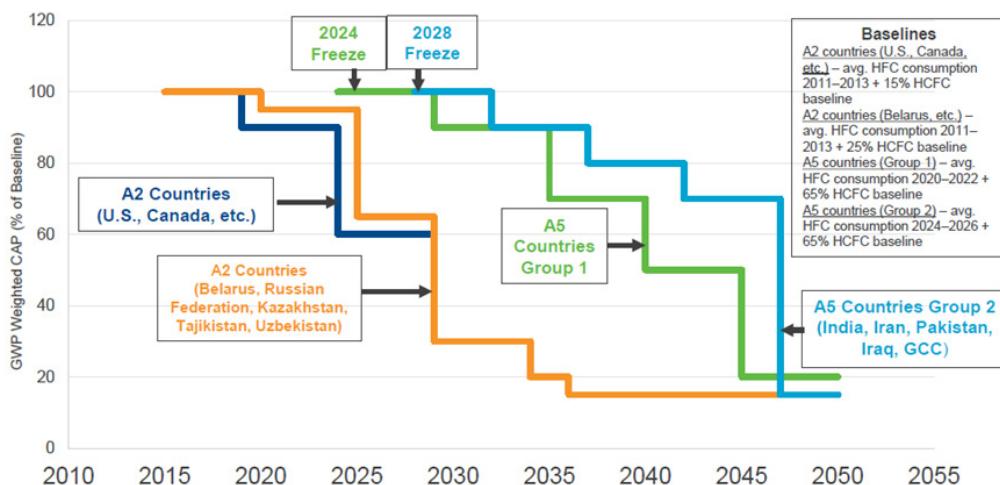
d. Where are HFCs used?

They are used mainly in refrigeration, air-conditioning, and heat pumps, such as supermarket refrigerators and building or car air-conditioning devices. They can also be found in insulating foams, some aerosols, and fire-protection equipment, and even in asthma inhalers.

e. How is the Kigali Amendment implemented?

Precise targets were set for Parties to the Montreal Protocol to phase down their production and consumption of HFCs. To this end, a detailed schedule was designed. As of 2019, developed countries (A2) have had to adapt to these measures. Developing countries (A5) will be starting from 2024 as shown in the graphic below.

Kigali Amendment to the Montreal Protocol October 15, 2016



Ref: conf.montreal-protocol.org/meeting/mop/mop-28/crps/English/mop-28-crp10.e.docx

Global Agreement on HFC Phase-Down Reached by 197 Countries of the World, in Kigali, Rwanda, on October 15, 2016

8

f. What can you do to support the Kigali Amendment?



1. Turn off the air-conditioner when you are not at home. Open screened windows when outside air is comfortable.



2. Have your air-conditioner serviced and maintained by a certified technician properly to help prevent refrigerant leakage and increase the energy efficiency of your equipment.



3. When purchasing new appliances, look for refrigerators, freezers, air-conditioners, or heat pumps which contain low-GWP refrigerants and have higher energy efficiency.



4. Dispose of your freezers, refrigerators, and air-conditioning units properly. Locate recycling centers in your area. Utility companies will sometimes pick up used refrigerators.



5. Become an advocate for the environment. Spread the word.



6. Ask colleagues, classmates, teacher etc. about HFCs to open up discussion spaces.



7. Talk to the elected representatives about climate change and the impact of HFCs.

IV. THE KIGALI AMENDMENT AND THE SUSTAINABLE DEVELOPMENT GOALS (SDGs)

With the adoption of the Kigali Amendment, the Montreal Protocol joins the Paris Agreement in taking charge of HFCs and plays a major role in the preservation of an environmentally sustainable world where no-one is left behind, in accordance with the 2030 Agenda for Sustainable Development.

This Amendment to the Montreal Protocol also contributes directly to the 2030 Agenda for Sustainable Development in the realisation of several of its 17 goals.

2 ZERO HUNGER



Refrigeration plays a crucial role in preserving food and, by using the appropriate refrigerants, a sustainable "cold chain" can be achieved. This is a significant lever in the fight against food waste and crop loss, as well as in the fight against hunger and poverty, to reach the Sustainable Development Goals, in particular "Zero Hunger" by 2030.

3 GOOD HEALTH AND WELL-BEING



While HFCs do not destroy stratospheric ozone, the Montreal Protocol is still working hard to phase down many of the earlier chemicals that do. Actions taken to protect the ozone layer will help restore its capacity to filter UV rays, which will reduce the risk of developing severe illnesses like skin cancer and cataracts. A sustainable cold chain further contributes to maintaining vaccines in usable condition, running air-conditioning units necessary for medical purposes, and promoting productivity and general well-being. The replacement of CFCs and HFCs in inhalers used to treat asthma and other respiratory diseases is another way in which the Protocol contributes to this goal.

5 GENDER EQUALITY



In the actions they undertake, the Ozone Secretariat, UN agencies, implementing partners, Assessment Panels, and National Ozone Units must integrate a gender-specific perspective and analyse the relevance of gender issues regarding their mandate. Health effects and other risks, for example, can vary according to gender, and this should be considered.

7 AFFORDABLE AND CLEAN ENERGY



The current goal is to find alternatives to HFCs which not only have a low global warming potential, but also induce a better energy efficiency and sustainability. This can be achieved through improved devices and equipment (e.g., better energy efficiency, avoidance of refrigerant leaks) and integrating safety standards, among other measures. Moreover, preventing energy overconsumption lowers harmful emissions in the atmosphere.

8 DECENT WORK AND ECONOMIC GROWTH

Actions impacting the cold chain will also affect numerous products on the market, in particular those exported overseas (seafood, fruit and vegetables, flowers, etc.). Attention to the cold chain all along the process, from farm to fork, including storage and transport, is vital, since proper cooling impacts the quality of products and timely delivery. Money saved on electricity from higher energy efficiency can be spent locally on health, nutrition, housing, education, and other quality of life expenditures. All industries are involved in maintaining the best cooling practices to support decent work and economic growth goals.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

The vast majority of cold chain equipment will have to be renewed, implying innovations and industrial development. To meet Kigali Amendment goals, devices will no longer contain or rely on HFCs.

11 SUSTAINABLE CITIES AND COMMUNITIES

Urban cooling and transport will have to consider the requirements introduced by the Kigali Amendment. Switching to low-GWP refrigerants and upgrading energy efficiency while converting to new equipment will help reduce climate change and lessen the need for new power plants. In turn, this will contribute to lower air temperatures, cleaner air, and, as a result, better public health in cities and other communities.

13 CLIMATE ACTION

Implementing the Kigali Amendment is an important step in the battle against climate change. Countries will have to adopt sound rules and regulations to comply with their commitments to phase down HFCs. Awareness-raising about the new rules will help everyone make the best everyday choices for the climate, and workers in the refrigeration and air-conditioning and thermal insulating foam sectors will receive training on proper installation and maintenance of equipment to avoid refrigerant leaks and maximize energy efficiency.

17 PARTNERSHIPS FOR THE GOALS

Sharing ideas and the best results obtained will be one of the main vectors of success for sustainable development. The Protocol is an excellent example of international and national partnerships involving numerous stakeholders and regular exchange of data and knowledge.

V. EXAMPLES OF COMMUNICATION CAMPAIGNS

It is essential to raise awareness among workers of related industries as well as in the general public about the need to make the right choices and reduce the use of HFCs.



----- **Bahrain** has developed a simplified flyer on the Kigali Amendment in English and Arabic for local stakeholders and governmental authorities.

Source: Hassan Moubarak, NOU Bahrain,
hmubarak@SCE.GOV.BH

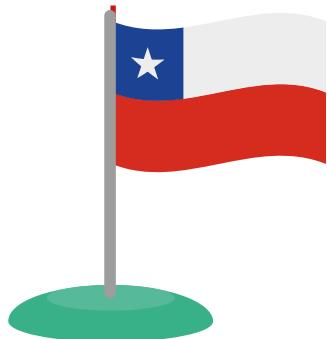


In **Bangladesh** a videoclip was released to raise awareness on HFC gases and their impact on the environment, health... Guidance is given on how to choose an environment friendly and energy efficient refrigerator or air conditioner.

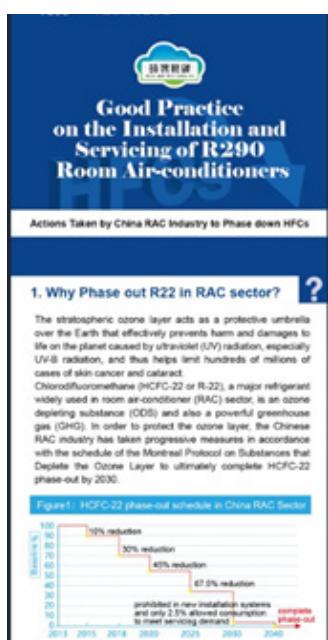
Source: https://www.youtube.com/watch?v=_hqf2JyZDTI



In **Chile**, the National Ozone Unit of the Ministry of Environment is implementing several projects in the business sectors where ODS are most used. The website provides a wealth of information, including a brochure and a page about the Kigali Amendment.



Source:
<https://ozono.mma.gob.cl/enmienda-de-kigali/>



In **China**, as part of the HFC phase-down, an infographic was created to raise awareness in local industries. Good practices in air-conditioning equipment installation and maintenance are demonstrated.

Source:
<https://www.cheaa.org/contents/116/9061.html>

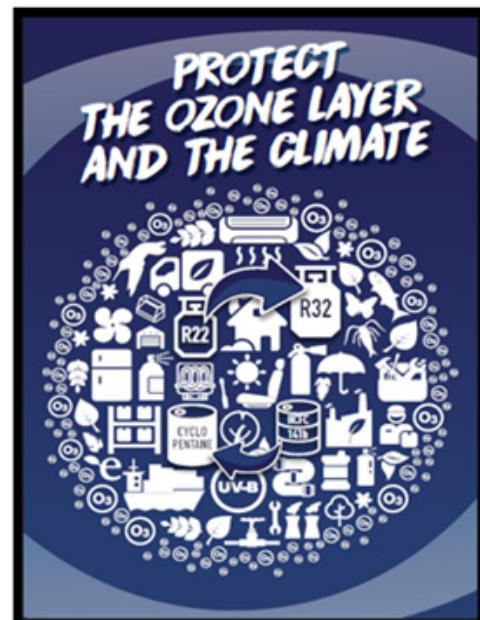


In **Colombia**, industries manufacturing and selling household appliances have to contribute to a better planet through the Red Verde programme. It is the first recycling programme for post-consumer devices in Colombia, put together by the alliance of several companies (Haceb, LG, Mabe, Panasonic, Whirlpool, Electrolux...) with the support of the National Union of Business contractors of Colombia (ANDI), the Ministry of Environment and Sustainable Development, and the Ozone Technical Unit of the country.

Source: <https://www.redverde.co/>



Indonesia/UNEP Asia & Pacific have developed an awareness-raising booklet on the Montreal Protocol and Kigali Amendment, "Protect the Ozone Layer and the Climate". The publication was translated into English by UNEP and distributed to all Asia-Pacific countries.





In **Iran**, simple specific communications have been designed for various target audiences: general public, governmental stakeholders, importers, etc.

Source: <https://ozone.doe.ir/portal/home/default.aspx>



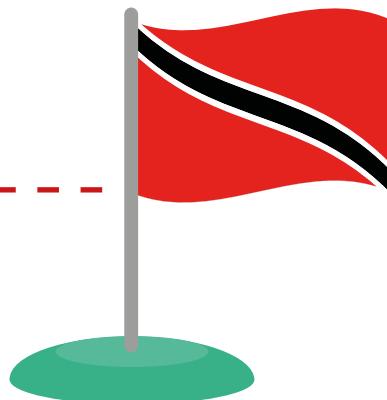
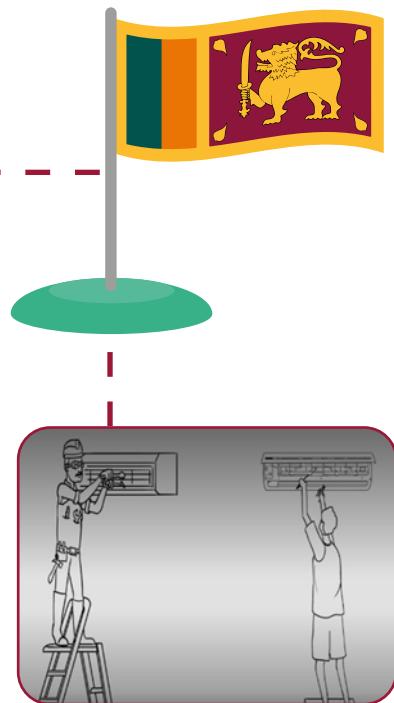
In **Rwanda**, the Environment Management Authority (REMA) has launched an awareness-raising campaign on why and how to choose energy - and money - saving refrigerators and air-conditioners instead of less efficient cooling appliances.

Source:
<https://united4efficiency.org/rema-and-unep-u4e-launch-efficient-cooling-awareness-campaign/>

Sri Lanka - the National Ozone Unit of Sri Lanka has begun to adopt online modes of raising awareness. As a result, National Ozone Day 2021 was conducted completely online and it was a success. Further, 10 awareness-raising videos were developed in English and in the native languages Sinhala and Tamil to be published on the unit's youtube channel for learning and awareness. The contents of the videos include basic ozone science, the linkage between ozone layer depletion and climate change, maintaining the refrigerator, recognition of prior learning, and the functions of the National Ozone Unit.

The videos are also shared on the National Ozone Unit's Facebook page to reach out to wider subscribers. In the meantime, the trainers of technical and awareness training programs in the NOU use them during the training delivery. The reach is monitored through Youtube and Facebook analytics.

Source: https://www.youtube.com/playlist?list=PL4x1fOz3sYri3rj5GT0r1skKBtg2J_IDo



Trinidad and Tobago have launched the "Energy Efficiency in RAC" (EE in RAC) project that features:

- a blog that provides updates on the activities of the National Ozone Unit of Trinidad and Tobago and supports meeting all obligations under the Montreal Protocol;
- an Instagram page;
- a variety of capacity-building events and certifications.

Source: <http://nou-tt.blogspot.com/>

VI. GLOSSARY

Amendment: a partial change or addition, approved by a vote, designed to improve a text, piece of legislation, etc.

Charter: a written document including a set of rights and duties, laws and principles.

Hydrochlorofluorocarbons (HCFCs): refrigerants used, before being banned, in refrigeration equipment. They are potent Ozone Depleting Substances.

Hydrofluorocarbons (HFCs): man-made chemicals used as alternatives to HCFCs (ODS banned by the Montreal Protocol). They are potent greenhouses gases and are controlled under the Kigali Amendment.

Infographic: a collection of computer-generated imagery, a visual representation of information or data.

International Community: Member states, countries of the United Nations.

International Organisation: association of States or other institutions under an international treaty or multilateral convention.

Ozone: a gas whose molecule is formed of three atoms of oxygen.

Ozone depleting substance (ODS): chlorinated or fluorinated gas responsible for the depletion of the ozone layer.

Protocol: diplomatic document, indicating the detailed implementation of the terms of a treaty agreed to in a conference and signed by the parties. The Montreal Protocol follows the Vienna Convention.

UV-B: invisible radiations, part of the ultraviolet spectrum, which penetrates the outer layers of the skin and are the main cause of skin cancer.

VII. INFORMATION SOURCES

CCAC – Climate & Clean Air Coalition

website:

<https://www.ccacoalition.org/en/initiatives/hfc>

Multilateral Fund for the Implementation of the Montreal Protocol

website:

<http://www.multilateralfund.org/default.aspx>

The World Bank

website:

<https://www.worldbank.org/en/home>

UNDP - The United Nations Development Programme

website:

<https://www.undp.org/>

UNEP – Ozone Secretariat

website:

<https://ozone.unep.org/>

UNEP OzonAction: United Nations Environment Programme - OzonAction

Latest news, information about events, meetings, resources, publications, contacts, factsheets, videos and databases, all available for consultation, on all the subjects related to the Montreal Protocol, including the Kigali Amendment

websites:

<https://www.unep.org/>

<https://www.unep.org/ozonaction/>

UNIDO – United Nations Industrial Development Organization

website:

<https://www.unido.org/our-focus-safeguarding-environment-implementation-multilateral-environmental-agreements-montreal-protocol/montreal-protocol-evolves-fight-climate-change>



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