

OzoNews

A fortnightly electronic news update on ozone and climate protection and the implementation of the Montreal Protocol brought to you by OzonAction

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GLOBAL

1. Kigali Amendment latest ratifications

Congratulations to the latest countries which have ratified the Kigali Amendment:

[United Arab Emirates, 19 April 2024](#)

[Thailand, 3 April 2024](#)

[Djibouti, 8 Mar 2024](#)

[Guatemala, 11 January 2024](#)



At the Twenty-Eighth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, held in Kigali from 10 to 15 October 2016, the Parties adopted, in accordance with the

procedure laid down in paragraph 4 of article 9 of the 1985 Vienna Convention for the Protection of the Ozone Layer, a further amendment to the Montreal Protocol as set out in Annex I to the report of the Twenty-Eighth Meeting of the Parties (Decision XXVIII/1).

Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Status of Ratification 15 October 2016 to [date](#).

[United Nations Treaty Collection](#)

Image: UN Treaty Collection website

2. ASHRAE and UNEP Launch the 2024 Lower GWP Innovation Award

Paris, 9 April 2024 – ASHRAE and UNEP OzonAction are pleased to announce the opening for submissions for the [2024 Lower GWP Refrigeration & Air-Conditioning Innovation Award](#) until the [closing date, 15 August 2024](#).

The Award is intended to promote innovative design, research, and practice by recognizing people who have developed or implemented innovative technological concepts applied in developing countries to minimize global warming potential (GWP) through refrigeration and air-conditioning applications. The Award is part of the ASHRAE-UNEP OzonAction joint workplan for 2024-2025.



The Award selection criteria include:

- Description of innovation in the field of lower-GWP refrigerants.
- A confirmation project that has been implemented in a developing country.
- The extent of need.
- Environmental impact achieved including specific reference to the use of low-GWP refrigerants or technology.
- Description of further application in developing countries from both the technology and economic perspectives, including how the innovation is financially feasible to be replicated.

Information about the Award and the online submission form can be found at ashrae.org/lowerGWP. The jury, selected by ASHRAE and UNEP, will be made up of an international jury of experts in the field of refrigerant research and management.

Individuals, working alone or in teams, are eligible to enter. Awards are presented in Residential and Commercial/Industrial Facility categories, and only projects implemented in developing countries are considered.

Projects selected for the 2024 Lower GWP Refrigeration & Air-Conditioning Innovation Awards will be announced at Montreal Protocol related events and ASHRAE conferences ASHRAE and UNEP will also team up to disseminate information to specialists and government officials in developing countries about the selections to raise awareness of successful technology applications.

For more information:

ASHRAE Contact for Partner Activities

[Mark Owen](#), Director of Publications and Education, ASHRAE

UNEP Contact for Partner Activities

[W. Stephen Comstock](#), Senior Consultant, OzonAction Partnerships, UNEP

UNEP, OzonAction, 9 April 2024

Image: Shutterstock



3. Meeting of the Chemical group of the Medical and Chemical Technical Options Committee (MCTOC), Paris, France, 15-17 April 2024

On 15-17 April 2024, UNEP OzonAction were pleased to host the meeting of the Chemical group of the Medical and Chemical Technical Options Committee (MCTOC) at their headquarters in Paris.

The Chemical group met to prepare reports that TEAP will review and forward for consideration at the Montreal Protocol's Open-ended Working Group meeting in July.

The reports cover a range of chemicals topics related to very short-lived substances (VSLs), and emissions of feedstock uses of controlled substances and of carbon tetrachloride (CTC). The reports will include updates on medical and aerosols uses of

controlled substances, including metered dose inhalers, prepared during MCTOC's online meetings between February and April.

Very short-lived substances are not controlled substances. The Montreal Protocol still monitors these chemicals because they contribute to the total chlorine that impacts depletion of the ozone layer. In response to Decision XXXV/6, MCTOC will be providing an update on how these chemicals are used and possible alternatives.

Feedstocks are chemical building blocks involved in the commercial synthesis of other chemicals. Controlled substances (ODS and HFCs) can be used as feedstocks. Emissions from feedstock uses consist of residual levels in the ultimate products, and fugitive leaks in the production, storage and/or transport processes. In response to Decision XXXV/8, MCTOC will be providing updated information on feedstock uses; emissions sources, estimates, and trends, and comparisons with atmospheric observations; possible alternatives; and best practices to avoid emissions.

In response to Decision XXXV/9 on abating emissions of CTC, MCTOC will be providing updated information on emissions of CTC by source categories and on alternatives to CTC used as feedstock.

UNEP, OzonAction, April 2024

Image: OzonAction

4. Seal pups and penguin chicks exposed to more UV in Antarctica

Over the last 25 years, the ozone hole which forming over Antarctica each spring has started to shrink.

But over the last four years, even as the hole has shrunk it has persisted for an unusually long time. Our new research found that instead of closing up during November it has stayed open well into



Photo David Schultz / Mer Images via AFP

December. This is early summer - the crucial period of new plant growth in coastal Antarctica and the peak breeding season for penguins and seals.

That's a worry. When the ozone hole forms, more ultraviolet rays get through the atmosphere. And while penguins and seals have protective covering, their young may be more vulnerable.

Why does ozone matter?

Over the past half century, we damaged the earth's protective ozone layer by using chlorofluorocarbons (CFCs) and related chemicals. Thanks to coordinated global action these chemicals are now banned.

Because CFCs have long lifetimes, it will be decades before they are completely removed from the atmosphere. As a result, we still see the ozone hole forming each year.

The lion's share of ozone damage happens over Antarctica. When the hole forms, the UV index doubles, reaching extreme levels. We might expect to see UV days over 14 in summers in Australia or California, but not in polar regions.

Luckily, on land most species are dormant and protected under snow when the ozone hole opens in early spring (September to November). Marine life is protected by sea ice cover and Antarctica's moss forests are under snow. These protective icy covers have helped to protect most life in Antarctica from ozone depletion - until now.

Unusually long-lived ozone holes

A series of unusual events between 2020 and 2023 saw the ozone hole persist into December. The record-breaking 2019-2020 Australian bushfires, the huge underwater volcanic eruption off Tonga, and three consecutive years of La Niña. Volcanoes and bushfires can inject ash and smoke into the stratosphere. Chemical reactions occurring on the surface of these tiny particulates can destroy ozone.

These longer-lasting ozone holes coincided with significant loss of sea ice, which meant many animals and plants would have had fewer places to hide.

What does stronger UV radiation do to ecosystems?

If ozone holes last longer, summer-breeding animals around Antarctica's vast coastline will be exposed to high levels of reflected UV radiation. More UV can get through, and ice and snow is highly reflective, bouncing these rays around.

In humans, high UV exposure increases our risk of skin cancer and cataracts. But we don't have fur or feathers. While penguins and seals have skin protection, their eyes aren't protected.

Is it doing damage? We don't know for sure. Very few studies report on what UV radiation does to animals in Antarctica. Most are done in zoos, where researchers study what happens when animals are kept under artificial light.

Even so, it is a concern. More UV radiation in early summer could be particularly damaging to young animals, such as penguin chicks and seal pups who hatch or are born in late spring.

As plants such as Antarctic hairgrass, *Deschampsia antarctica*, the cushion plant, *Colobanthus quitensis* and lots of mosses emerge from under snow in late spring, they will be exposed to maximum UV levels.

Antarctic mosses actually produce their own sunscreen to protect themselves from UV radiation, but this comes at the cost of reduced growth.

Trillions of tiny phytoplankton live under the sea ice. These microscopic floating algae also make sunscreen compounds, called microsporine amino acids.

What about marine creatures? Krill will dive deeper into the water column if the UV radiation is too high, while fish eggs usually have melanin, the same protective compound as humans, though not all fish life stages are as well protected.

Four of the past five years have seen sea ice extent reduce, a direct consequence of climate change.

Less sea ice means more UV light can penetrate the ocean, where it makes it harder for Antarctic phytoplankton and krill to survive. Much relies on these tiny creatures, who form the base of the food web. If they find it harder to survive, hunger will ripple up the food chain. Antarctica's waters are also getting warmer and more acidic due to climate change.

An uncertain outlook for Antarctica

We should, by rights, be celebrating the success of banning CFCs - a rare example of fixing an environmental problem. But that might be premature. Climate change may be delaying the recovery of our ozone layer by, for example, making bushfires more common and more severe.

Ozone could also suffer from geoengineering proposals such as spraying sulphates into the atmosphere to reflect sunlight, as well as more frequent rocket launches.

If the recent trend continues, and the ozone hole lingers into the summer, we can expect to see more damage done to plants and animals - compounded by other threats.

We don't know if the longer-lasting ozone hole will continue. But we do know climate change is causing the atmosphere to behave in unprecedented ways. To keep ozone recovery on track, we need to take immediate action to reduce the carbon we emit into the atmosphere.

** By Sharon Robinson, University of Wollongong, Laura Revell, University of Canterbury and Rachele Ossola, Colorado State University*

Radio New Zealand, 28 April 2024

Image: RNZ website | Photo: David Schultz / Mint Images via AFP

5. The ozone layer's recovery shows how to protect the planet

There was a time, not so long ago, when the depletion of Earth's ozone layer seemed like an insurmountable challenge.

Decades of using harmful chemicals, such as chlorofluorocarbons (CFCs), threatened to cause irreparable damage to our planet. Without swift action, we faced the risk of climate destabilization, ecosystem collapse and the breakdown of our food system. Consequences that were once almost unthinkable became painfully real.

However, then the most remarkable thing happened: Humanity united to protect the ozone layer. Heeding the warnings of Nobel laureate scientists Paul Crutzen, Mario Molina and Sherwood Rowland, whose research underscored the severity of the threat, we did not ignore or dismiss the scientific evidence, nor did we bury our heads in the sand and claim that the challenge was too daunting. Instead, the global community recognized the urgent need for collective action.

By harnessing scientific knowledge, entire industries have been transformed and equitable policies have been put in place to shield countries that did not contribute to the problem.

Thanks to the Montreal Protocol, ratified by 197 countries, nearly 99 percent of ozone-depleting substances have been phased out. This includes the reduction and replacement of CFCs, which has slowed climate change by at least a decade.



The successful global effort to protect the ozone layer should serve as a beacon of hope for all of us. It is one of humanity's greatest environmental achievements, showing what we can achieve when we act together with commitment, respect, and determination.

However, it can also serve as a warning. A study last year by Johan Rockstrom and 28 other leading climate scientists revealed a startling new reality, underscoring the need to adopt a collaborative approach to protecting the planet before it is too late.

The planetary boundaries model, introduced by Rockstrom and others in 2009, provides a useful framework for assessing the planet's health. It identifies nine interconnected factors – including climate, freshwater availability, biodiversity, and land use – that are crucial for the planet's stability and habitability.

In their recent study, Rockstrom and his co-authors found that six of these nine boundaries have already been breached, putting Earth on a dangerous course that undermines the planet's resilience and jeopardizes human well-being. Notably, the ozone layer is the only area showing signs of improvement.

Given that Earth functions as an interconnected system, we cannot solve one problem without addressing the others. Despite being aware of the critical role of planetary boundaries in preserving our Earth's habitability, we have not acted decisively enough to halt our slide toward catastrophe.

For example, we know that more than a million species are on the brink of extinction, potentially triggering the collapse of entire ecosystems. We also know that nitrogen and phosphorous runoff leads to the proliferation of toxic algae blooms in oceans and freshwater systems, thereby breaching the biogeochemical flow boundary. Similarly, tolerating dangerous levels of chemical pollution and allowing our children to ingest microplastics compromise the life-support systems necessary for humanity's survival.

To restore Earth's stability, governments must recognize the need to respect the nine planetary boundaries. This requires a steadfast commitment to reducing greenhouse gas emissions and protecting biodiversity and water resources.

Moreover, our chances of success increase exponentially when we cooperate: If the international community can unite as it did when it agreed to repair the ozone layer, there is hope.

First, we must heed the advice of indigenous peoples and local communities and listen to what nature is telling us. Despite making up less than 5 percent of the global population, indigenous communities act as the planet's wise custodians, protecting at least one-quarter of the world's land and seas and 80 percent of its biodiversity.

To advance this approach, we have joined forces with Planetary Guardians, an independent collective of global leaders, scientists and environmental advocates championing the planetary boundaries model. Our goal is to promote its adoption as a framework for assessing and guiding collective climate action.

By bringing together leaders from various countries, industries, age groups, genders and cultures, Planetary Guardians aims to leverage our diverse backgrounds and experiences to find solutions to protect the planet. While our planet's resources are finite, there is no limit to human ingenuity and our capacity for solving complex problems. The real question is what Earth we wish to leave to future generations.

To be sure, there are no simple answers or quick fixes. Our future hinges on the steps each of us is willing to take. However, in saving the ozone layer, we have already shown that taking swift, informed, collective action can facilitate the changes needed to sustain human life on Earth.

The Taipei Times, 23 April 2024, By Robert Redford and Xiye Bastida

Image: The Taipei Times website

6. Magnetic cooling could reduce fluoride emissions into atmosphere

The environmental safety of cooling systems in household appliances could be ensured with the use of an alloy of nickel, manganese, tin, and a small amount of copper, which almost irreversibly cools down by 13 degrees Celsius under the influence of magnetic fields. Such was the conclusion made by scientists from the Amirkhanov Institute of Physics of the Dagestan Federal Research Center of the Russian Academy of Sciences (RAS) based on a study, the results of which have been published in the journal Applied Physics Letters.



As a rule, cooling systems used in air conditioners and refrigerators operate on the basis of compressor cooling: temperature decreases due to refrigerants – substances (usually gases) that take away the heat from the object that needs to be cooled when they evaporate. However, at elevated temperatures, like when a refrigerator is being defrosted, refrigerants release toxic compounds, including fluorine and hydrogen chloride.

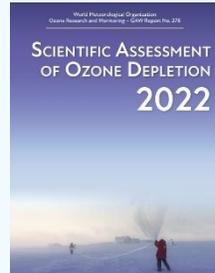
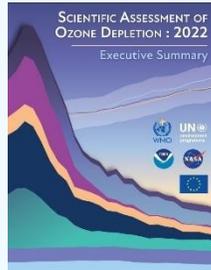
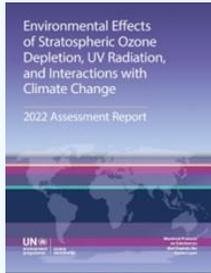
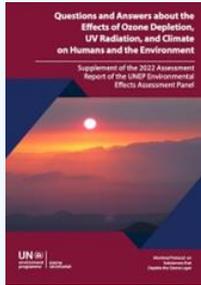
A greener alternative is magnetic cooling, during which a solid substance changes its temperature in response to the magnetic field surrounding it. If an object is placed in a gradually increasing magnetic field, the substance will begin to cool down and absorb heat from the environment. Alternately, when the magnetic field decreases, the object will release heat and become warmer. Magnetic cooling also operates in a wider temperature range, including temperatures close to absolute zero (minus 273.15 degrees Celsius), whereas a conventional refrigerator operates in the range from plus 4 to minus 20 degrees Celsius. This is why scientists are actively searching for materials that would be particularly effective in terms of magnetic cooling.

One such material has been proposed by the scientists from the Amirkhanov Institute of Physics of the Dagestan Federal Research Centre RAS, who studied the ability of an alloy based on nickel, manganese, tin, and a small amount of copper to change its temperature under the influence of a magnetic field. The authors conducted an experiment, in which they placed the alloy in a device, to which constant and pulsed magnetic fields were applied. To assess the magnetic properties of the alloy under study, scientists changed the temperature in the device within the range from minus 25 to plus 50 degrees Celsius.

The greatest effect was achieved at a device temperature of 1.85 degrees Celsius: under these conditions, the magnetic field's impact on the alloy made it possible to reduce its temperature by 13.15 degrees Celsius. At the moment of exposure to the magnetic field, the sample was isolated from the environment and could not exchange heat with it. After the magnetic field was turned off, the alloy maintained a low temperature (minus 11 degrees Celsius). This means that the new alloy can potentially be used in hybrid cooling systems that combine the compressor and magnetic methods.

"The proposed method makes it possible to cool down objects by minus 13 degrees Celsius in just 0.1 seconds. As a point of comparison, it takes an average of 1 minute to cool down a gas refrigerant-based refrigerator by 1.8 degrees Celsius. Therefore, magnetic cooling demonstrates more efficient results. The data obtained will be useful in the development of hybrid cooling systems, such as household refrigerators," Adler Gamzatov, leading researcher at the Amirkhanov Institute of Physics of the Dagestan Federal Research Centre RAS, is quoted as saying by the Russian Science Foundation.

As Sergey Alekseenko, laureate of the Global Energy Prize and member of the RAS, said in an interview with the Global Energy Association, moving away from using ozone-depleting freons and other industrial halogen-containing gases could solve the problem of ozone layer destruction. *"As an alternative, manufacturers have started actively employing ozone-friendly freons, mainly hydrofluorocarbons of the Freon 134a type, which is now widely used in refrigerators. But both ozone-depleting and ozone-friendly freons are strong greenhouse gases. This is why they are also going to be banned from use in the near future,"* he noted.



Watch out for Illegal Trade of HCFCs and HFCs: Lessons learnt from the Global Montreal Protocol Award for Customs and Enforcement Officers. This publication provides an analysis of the cases submitted in the context of the [Global Montreal Protocol Award for Customs and Enforcement Officers](#). The Global Award was launched in 2018 by UNEP OzonAction. This Global Award is intended to raise awareness about the Montreal Protocol and to recognise customs and enforcement officials for their efforts in preventing and combating illicit traffic in Montreal Protocol and Kigali Amendment-regulated substances. Ozone-depleting substances (ODS) include hydrochlorofluorocarbons (HCFCs) and other compounds with a high Global Warming Potential (GWP), particularly hydrofluorocarbons (HFCs).



UNEP OzonAction, ASHRAE, April 2023 Fact sheet: Update on New Refrigerants Designations and Safety Classifications. The purpose of this fact sheet is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an «R» number over the last few years and introduced into the international market.



Sustainable cold chains: Virtual Exhibition - The virtual exhibition for sustainable cold chains aims to highlight the critical role of cold chains in ensuring food safety and security, access to vaccines, reducing global warming and preventing ozone layer depletion.

The exhibition showcases commercially available cold chain technologies for food and vaccines, mainly targeting applications and equipment with refrigeration and cooling cycles that use ozone and climate-friendly refrigerants and have enhanced energy efficiency characteristics. It also aims to promote game-changing and systemic approaches, relevant initiatives, and not-in-kind solutions to cold chains

These technologies and approaches directly contribute to meeting national obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer including its Kigali Amendment and the Paris Agreement on Climate Change. Sustainable cold chain contributes to the achievement of many **Sustainable Development Goals**.

The exhibition is ongoing and continuously updated with submissions accepted on a rolling basis. The partners of the exhibition will continue promoting the exhibition at all relevant events throughout 2022 and beyond.

Click [here](#) for more information / submit a nomination >>>

Image: Sustainable cold chains website



Categories

 <p>1 exhibits On site post-harvesting and/or precooling applications</p>	 <p>3 exhibits Storage of product, e.g. large warehouses / Distribution centers</p>	 <p>0 exhibits Storage on board ships, aircraft, and containers</p>
 <p>4 exhibits Food processing plants</p>	 <p>1 exhibits Transport (large and smaller trucks, smaller containers)</p>	 <p>6 exhibits Supermarkets (wholesale markets & Retailers)</p>
 <p>1 exhibits Food services (Restaurants, cafes, tourism facilities, etc)</p>	 <p>2 exhibits Vaccines and other pharmaceutical products</p>	 <p>0 exhibits Game-changing and systemic approaches</p>

Vanuatu's Case Study on Integrating ODS/HFC Module into the National Single Window System - The National Single Window is a centralized system that links all relevant government approving authorities and acts as a 'one-stop-shop' where importers and exporters may submit applications electronically including information and all required paperwork to support the application and approval process. [Read/Download the Factsheet >>>](#)



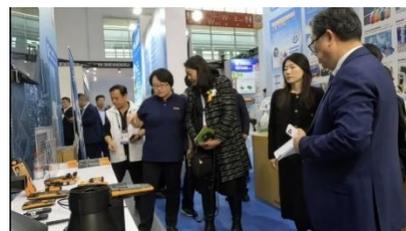
Recognition of Prior Learning Scheme for Refrigeration and Air-Conditioning Servicing Technicians in Mongolia - The Recognition of Prior Learning (RPL) process can help those in the industry acquire a formal qualification that matches their knowledge and skills and thereby contributes to improving their employability, mobility, and lifelong learning. RPL can make a significant contribution to providing the relevant learning framework necessary for the present and ongoing maintenance of a quality workforce, especially in the RAC servicing sector. In Mongolia, the RPL process has been rolled out in over 30 TVET trades in the construction, mining, and other sectors, including apparel and culinary etc. Mongolia initiated the RPL scheme for RAC servicing technicians as part of their implementation of the HPMP in cooperation with various national stakeholders. [Read/ Download the Factsheet >>>](#) [UN Environment Programme, OzonAction](#)



ASIA AND THE PACIFIC

7. Ozone2Climate Technology Industry Roundtable and Roadshow at China Refrigeration Expo 2024

Beijing, People's Republic of China, 24 April 2024 – United Nations Environment Programme (UNEP) OzonAction Compliance Assistance Programme (CAP) team in Asia and the Pacific successfully co-organized the 2024 Ozone2Climate Technology Roadshow and Industry Roundtable from 8-9 April 2024. This event took place during the 35th International Exhibition for Refrigeration, Air-Conditioning, Heating and Ventilation, Frozen Food Processing, Packaging and Storage, also known as the China Refrigeration Exhibition 2024. Partners in this event included the China Refrigeration and Air-conditioning Industry Association (CRAA), the Foreign Environmental Cooperation Center (FECO), the Ministry of Ecology and Environment of the People's Republic of China, and the United Nations Development Programme (UNDP).



UNEP OzonAction recognizes the environmental protection roles of the refrigeration and air-conditioning (RAC) industry whose technologies underpin human health, safety, and even food security. The RAC sector will only continue to grow rapidly in high demand on a global scale.

Attended by over 1,000 exhibitors and over 70,000 visitors, the China Refrigeration Exhibition serves as an interactive hub for innovation and knowledge exchange. It is an interactive platform where

industry leaders showcase cutting-edge, sustainable solutions and forge partnerships that will define the future of cooling and environmental responsibility. The exhibition indeed solidifies China's position as one of the global leaders in shaping the sustainable future of the RAC sector.

This event highlights Ozone2Climate technologies in research, development, and commercial application of zero-Ozone Depleting Potential (ODP), lower-Global Warming Potential (GWP) and higher energy efficient technologies in the RAC sector. This collaborative environment supports worldwide efforts and accelerates the development of solutions for the protection of the ozone layer and mitigation of climate change guided by the Montreal Protocol on Substances that Deplete the Ozone Layer and the Kigali Amendment.

Taking an active part in the 2024 Ozone2Climate Technology Roadshow and Industry Roundtable, UNEP OzonAction, led by Ms. Elisa Rim, Interim Montreal Protocol Regional Coordinator, South Asia, moderated a session on the RAC Servicing Sector in Asia Pacific and delivered a comprehensive presentation highlighting the progress of Hydrochlorofluorocarbons (HCFC) Phaseout in the Asia Pacific region in the RAC sector as well as the emerging issues related to the upcoming implementation of the Kigali Amendment. OzonAction provides technical assistance to developing countries to phase out HCFCs and phase down hydrofluorocarbons (HFCs).

Stakeholders are encouraged to facilitate the introduction of Ozone2Climate technologies, address the challenges related to their market adoption, and enhance the capacity of the servicing sector to equip them to service the latest technologies safely and effectively.

Next year's Ozone2Climate Technology Roadshow and Industry Roundtable will be held in Shanghai at the end of April 2025.

Contact: [Ms. Elisa Giyeon Rim](#), Interim Montreal Protocol Regional Coordinator, South Asia CAP, Asia and Pacific Office, UNEP, OzonAction

UNEP, OzonAction ROAP, 24 April 2024

Image: UNEP OzonAction

8. Environment Ministry makes registration of HFC imports compulsory - Sri Lanka

The Ministry of Environment this week called for applications for the compulsory registration of businesses and individuals who wish to import hydrofluorocarbons (HFC) based imports for 2024. Completed applications along with supporting documents are to be submitted to the ministry before May 7. "Business entities/ individuals are not eligible to import HFCs for any purpose without registration," the notice cautioned.



The announcement comes after the Cabinet last month approved a plan to gradually reduce HFC imports, through an annual import quota system. HFCs are a group of synthetic gases primarily used for cooling and refrigeration with a high global warming potential.

As Sri Lanka is a signatory of the 'Montreal Protocol on Substances that Deplete the Ozone Layer', it has a legal obligation towards global environmental protection.

Moreover, Sri Lanka in 2018 ratified the Kigali Amendment to the Montreal Protocol, which aims at phasing down the production and consumption of HFCs globally by 80 – 85 percent by 2047.

Therefore, Sri Lanka is further legally bound to restrict the import, export, trade and consumption of HFC, on a phased basis.

In line with the restriction, the Montreal protocol has assigned Sri Lanka with a baseline for the HFC quota for 2024, amounting to the average total quantity of HFC-based refrigerants imported to Sri Lanka between 2020 and 2022.

According to the Environment Ministry, importers will be allowed to import refrigerants of the HFC series beyond 2024 in proportion to the quantity of refrigerants belonging to the HFC series imported in the years 2020, 2021 and 2022, and accordingly those HFC importers will only be entitled to a quota for HFC imports”.

[Daily Mirror Online, 25 April 2024, By Nuzla Rizkiya](#)

Image: Daily Mirror Online

LATIN AMERICA AND CARIBBEAN

9. Transforming the RAC Sector: UNEP in El Salvador Promotes Cooperation, Environmental Awareness, and Gender Equality

San Salvador, El Salvador, 16 April 2024 – During the week of March 22 to 28, a delegation from the United Nations Environment Programme (UNEP), OzonAction Branch for Latin America carried out a successful mission in El Salvador.



Organized by the OzonAction team under the management of Programme Officer, Markus Hoffmann, the visit's main objective was to strengthen cooperation between institutions and associations related to the Refrigeration and Air Conditioning (RAC) sector. In addition, activities were carried out to raise awareness among the main stakeholders about the negative impact that Hydrochlorofluorocarbons (HCFC) and Hydrofluorocarbons (HFC) have on the ozone layer and the climate system. Good practices in refrigeration and low global warming potential alternatives were also promoted among the RAC sector stakeholders, as well as gender equality in this area among different entities.

Highlighting El Salvador's commitment to gender equality, exclusive group sessions were held for more than 60 women who work in various professions and tasks within the refrigeration and air conditioning industry. During these sessions, the challenges faced by women in this field were addressed. The country's commitment to implementing the Multilateral Fund's gender policy in activities related to the Montreal Protocol was notable during the mission. The National Ozone Office of El Salvador is the first to be supported by UNEP to work jointly on mapping the differences, inequalities, and specific needs of women in the RAC sector. This effort aims to develop a strategic roadmap that supports and promotes the participation, empowerment, and increase of Salvadoran women in the cooling world.

"This mission represents a significant advance towards gender equality in Montreal Protocol projects, in line with the objective of ensuring that both women and men have the same opportunities, conditions, and access to rights as full-fledged citizens," national officials assure.

On the other hand, the informative sessions and workshops carried out with importers, end users, the refrigeration association (ASAIRE), and the technical staff of the RAC sector, played a fundamental role in raising awareness about the importance of adopting good practices and comprehensive management of refrigerant substances present in the equipment. Emphasis was placed on the

relevance of using alternative refrigerants with low global warming potential, as well as on the importance of improving the energy efficiency of RAC equipment.

In addition, meetings with training institutions and the refrigeration association facilitated the creation of a joint action plan with the country's Ozone Office. This plan focuses on strengthening the technical skills of the staff operating RAC equipment and improving the quality of the services provided to users.

The Montreal Protocol, in line with the Sustainable Development Goals, contributes to reducing poverty, protecting the environment, and improving the quality of life of people around the world.

Contact: [Markus Hoffmann](#), Program Officer, UNEP OzonAction ROLAC

UNEP OzonAction, 16 April 2024

Image: UNEP OzonAction

10. Eco-friendly refrigeration: on the aquaculture highway in Chile

QUELLÓN, CHILE - The Patagonia region is home to a diverse natural landscape—from mountains, lakes and fjords to deserts and temperate rainforests. Chilean Patagonia, situated in the western part, also boasts a diverse ecosystem. Quellón serves as the starting point of the 30,000 km long Pan-American Highway, which traverses through a varied landscape.

The interior waters of Los Lagos Region in the south, particularly the Chiloé province, are renowned for the Chilean aquaculture industry—owing to the cool Humboldt currents that make it an ideal place, especially for salmonids, which comprise of salmon, trout, char and other fishes.

According to the Food and Agriculture Organization (FAO), **Aquaculture has great potential** to address the challenges of hunger and nutrition by feeding and nourishing the world's growing population. Aquaculture is projected to supply almost two-thirds of the fish consumed by people by 2030. However, the growth of the sector must be sustainable.

Beginning in the 1970s, the industrial-scale salmon aquaculture has grown rapidly, making Chile the world's second-largest producer of farmed salmon today, with exports totaling US\$6.47 billion in 2023, according to Chile's Central Bank. Chile primarily exports to the United States, Japan, and Brazil. Numerous fish farms of various sizes operate in the region, many with advanced logistical infrastructure, supplying fresh aquatic foods to foreign markets and providing direct employment to over 40,000 people (FAO, 2022).

A critical component in the Salmon production chain is the availability of hygienic refrigeration facilities. This is essential for supplying fresh aquatic foods to foreign markets via airfreight routes. The quality of the refrigeration facility depends on numerous factors, including the use of a particular refrigerant gas, handling of the gases, and availability of handling facilities, among others.

The industry was previously using refrigerants that were harmful if released into the environment. Chile's Ministry of Environment, National Ozone Unit, and UNIDO launched a project to demonstrate the use of natural refrigerants in the fisheries food chain sector. A company called **Marine Farm**, which is involved in aquaculture from egg production, processing to the final production, was chosen from the region for the project.

Marine Farm has a freezing capacity of 160 tons fish a day and cold storage capacity of 450 tons. "Their three condensing units in the production area were based on Freon gas (R 22), a synthetic refrigerant that damages the Ozone layer when it leaks or gets released into the atmosphere. Added

Eco-friendly refrigeration: on the aquaculture highway in Chile



to this was the problem of energy efficiency and oversized units. The facility also suffered from high leakage of the refrigerant due to its location by the sea—exposed to a high corrosive environment,” explained Rodrigo Serpa, UNIDO’s Project Manager.

Ammonia is one of the natural refrigerant gases, which is environmental-friendly and does not damage the ozone layer or contribute to global warming. The conversion project, where Ammonia replaced Freon using installed capacity, was designed by a local company Sofrisur. The project was implemented in record time, with the installation of 10 secondary refrigerant evaporators and all the requirements for extension and safety completed. The systems became operational before the end of 2023.

“The use of natural refrigeration within the different economic sectors of the country is advancing by leaps and bounds and in line with Chile’s commitments to the Montreal Protocol. This new system supports food safety processes by maintaining cold chains and becomes a reference for the industry, by showing that it is possible to have production processes with clean and efficient technologies.” Claudia Paratori, the National Ozone Officer explained.

“As a result of this transition, Marine Farm managed to mitigate the emission of 1.23 million kg of CO₂ equivalent, a significant step towards reducing its carbon footprint. Additionally, it joined the carbon footprint management registry of *Huella Chile*, demonstrating a continued commitment to mitigating climate change and implementing sustainable practices,” according to Patricio Alborno, Engineer responsible for the project.

“The immediate benefit was the reduction in energy consumption by 10% in the facilities,” said Rodrigo Serpa. “UNIDO is committed to promoting sustainable industrial development and transition to climate-friendly alternatives, even in remote places. We should go beyond with our projects and interventions because one of UNIDO’s priority areas is climate action”, he added.

Contact: [Ole Nielsen](#), Chief, [Montreal Protocol Division](#)

[The United Nations Industrial Development Organization \(UNIDO\)](#), 2 April 2024, By [Jayaraj Manepalli](#)

Image: UNIDO

WEST ASIA

11. Eurovent Middle East awards first F-gas training certificates

UAE: Eurovent Middle East has awarded the first certificates for F-gas handling to eleven HVACR engineers and technicians from refrigeration specialist EPTA Middle East.

During the three-day course, organised in conjunction with Italian training provider Centro Studi Galileo, technicians were trained on the correct handling and treatment of HVACR equipment containing fluorinated greenhouse gases.

Part of the association’s HVACR Leadership Academy, the course is dedicated to all professionals seeking to learn the best practices to install and perform servicing activities such as maintenance, repair, recovery, leakage checking as well as dismantling RAC systems containing F-gases.



The certification ceremony was organised at the margins of a four-day meeting of the West Asia Network of National Ozone Officers in Dubai organised by the United Nations Environment Programme (UNEP). [...]

CoolingPost, 26 April 2024

Image: CoolingPost website

EUROPE & CENTRAL ASIA

12. Joining forces with Customs and Enforcement Officers for Safeguarding the Montreal Protocol

The Europe and Central Asia (ECA) network implements enforcement-related activities since its inception in 2003, including regional enforcement meetings, border dialogues and a series of awards for Customs and Enforcement Officers. This year's ECA network and enforcement meeting took place in April 2024 in Tirana, Albania.

The article "[Joining forces with customs and enforcement officers for safeguarding the Montreal Protocol](#)" (available in [Russian](#) language)

served as a background document for the meeting. It outlines a number of initiatives and publications. It sets the scene with the Montreal Protocol (HCFC phase-out and HFC phase-down), followed by UNEP Montreal Protocol ECA network's enforcement meetings including the Global Montreal Protocol Award (5 editions since 2010). Moreover, it provides a brief overview of the World Customs Organization (WCO) initiatives, including reference to the Harmonized System (HS) for traded goods, and an Annex for the 2022 HS codes for commonly used substances controlled by the Montreal Protocol.

The article also refers to the Ozone Secretariat's initiatives, pointing to the 568 cases of illegal trade reported to the Ozone Secretariat over the period 2002-2024 (with specifics on the geographical distribution of the reported cases and most common substances and mixtures traded illegally).

The article highlights the common means of detecting illegal trade and strengthening enforcement frameworks along with lessons learnt and recommendations for successful enforcement. It ends with a list of eleven reading materials (i.e. Factsheet, Checklists, Manual, Guide, Technical Brief, Risk Assessment, etc.), one of which is the ECA Report on seizures and iPIC consultations.

The meeting in Tirana, Albania was jointly organized by UNEP OzonAction and the Montreal Protocol Unit of Albania's Ministry of Tourism and Environment. Participants included the Montreal Protocol Officers and Customs / Enforcement Officers of the 11 ECA network countries, 5 European Union countries as well as Enforcement Experts from World Customs Organization, Regional Intelligence Liaison Offices for Western Europe (RILO WE) and Eastern and Central Europe (RILO ECE), Interpol, European Commission DG Climate Action, European Anti-Fraud Office OLAF, Environmental Investigation Agency, CEFIC/ EFCTC, Ozone Secretariat, Fund Secretariat, UNIDO, UNDP, World Bank and UNEP. The meeting was well attended with over 70 participants, of which more than 50 per cent were female.

The meeting documents and presentations will be shared on [OzonAction Meeting Portal](#).

UNEP, OzonAction, 19 April 2024

Image: OzonAction website





13. Interviews with International Speakers of Centro Studi Galileo's conference 2024 on the new F-Gas Regulation

Galileo TV interviews several international guests in the framework of Mostra Convegno Expocomfort conference 2024 about the new F-Gas Regulation. The interviews can be watched both on Galileo TV, Centro Studi Galileo's YouTube channel, or on the International News section of industriaeformazione.it, Italian's most prominent HVAC/R blog.

Conducted by Centro Studi Galileo's Chief International Affairs, Silvia Romanò, the interviews saw some of the major experts of the sector: Bente Tranholm Schwarz, (European Commission), Stephen Yurek, (AHRI), Russell Patten (EPEE), Yosr Allouche, (International Institute of Refrigeration - IIR) and Madi Sakandé (U-3ARC).

All the interviews could be watched [here >>>](#)

[Centro Studi Galileo's YouTube channel, April 2024](#)

Image: Centro Studi Galileo

14. Charlotte Robinson from the UK Wins the Second Edition of the European Women in Cooling Video Competition

The refrigeration industry celebrates a new champion as Charlotte Robinson from the UK clinches the top spot in the second edition of the Women in Cooling video competition. Robinson impressed the judges with her hands-on practical troubleshooting of a compressor, showcasing her expertise and technical acumen in the field.



The competition, which underscores the vital contributions of women in the refrigeration industry, saw eight female professionals vying for the title. This year's event was particularly notable for its emphasis on practical and design skills, with Robinson's entry highlighting the importance of problem-solving abilities in maintaining and optimizing refrigeration systems.

The award ceremony, set to take place on the 23rd of May at the historic Titanic Museum in Belfast, will honour Robinson's achievement. The location is especially meaningful as it commemorates the 200th anniversary of Belfast-born William Thompson, Lord Kelvin, a pioneer in thermodynamics.

Robinson will receive a €1,000 cheque from World Refrigeration Day, and her travel, accommodation, and dinner expenses will be covered for the event by the hosts, BESA RACHP Group. Her winning video, along with the submissions from the other talented contestants, is now publicly available for viewing. The playlist showcases the innovative work and dedication of these professionals, providing inspiration for future generations of women and men in the industry.

Stephen Gill, Founder of World Refrigeration Day, enthusiastically said: " I am thrilled to congratulate Charlotte Robinson on her well-deserved victory in this year's Women in Cooling video competition. This competition celebrates not just individual achievement, but the collective progress and inspiring

potential of all women in refrigeration, air-conditioning, and heat pumps. Let us continue to support and amplify the visibility of such talented professionals, paving the way for a more diverse and inclusive future in our field."

In conjunction with the competition, the AREA general assembly will also be held over the same two days. This gathering will bring together 24 associations from 22 countries to discuss the latest policies on training and certification in light of the newly approved EU F-gas Regulation 3.0. This assembly is a crucial step towards harmonising standards across the industry and ensuring the highest levels of professional competence.

AREA President, Coen van de Sande, is also extremely happy with the quality and competence demonstrated by all the women who sent their excellent work. "I am very delighted with the high level of this year's contributions, and I am convinced that it will inspire other women to start their careers in Refrigeration Technology. AREA will gladly continue supporting and promoting initiatives like the Women in Cooling Competition that showcase the attractiveness of the RACHP sector."

The Women in Cooling video competition and the AREA general assembly are testament to the strides being made towards diversity and inclusion within the refrigeration industry. They serve as beacons for aspiring female engineers, technicians, and designers, encouraging them to explore and excel in this essential field.

This year, there were eight participants in the contest, open for the first time not only to those who work in the field as technicians but also to those involved in engineering design.

The participants were:

- **Charlotte Robinson – United Kingdom (winner)**
- **Katie Cronin – Ireland**
- **Tie Kieuw Lee – Netherlands**
- **Chloe Jennings – United Kingdom**
- **Sharon Byrne – Ireland**
- **Carmen Rodriguez Ortiz – Ireland**
- **Zdenka Bukovinová – Slovakia**
- **Joanne Mitchell – United Kingdom**

For more information on the competition, and to view the video submissions, including Charlotte Robinson's winning entry, please visit the official [playlist](#)

[AREA Secretariat & WRD Secretariat, 2 May 2024](#)

Image: AREA

15. Albanian arrested for refrigerant smuggling

GREECE: An Albanian van driver has been arrested in Greece for illegally transporting more than three tonnes of HFC refrigerant.

The 29-year-old man was arrested last Sunday in Florina, a town in northwestern Macedonia, by police officers of the Krystallopiqi Border Guard Department, for violating the legislation on the national customs code.

The intercepted van was found to contain 242 cylinders of refrigerant, weighing more than three tonnes. The authorities have not named the refrigerant involved but photos suggest at least some of the illegal load is R410A.

The shipment is said to have been received from an unguarded crossing of the Greek-Albanian border, and was lacking import, customs clearance, and payment of duties.



Photo General Regional Police Directorate Of Western Macedonia/ Florinasi Police Headquarters/Border Guard Department Kristallopigis



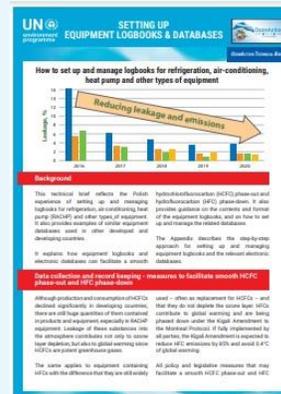
Photo General Regional Police Directorate Of Western Macedonia/ Florinasi Police Headquarters/Border Guard Department Kristallopigis

CoolingPost, 28 April 2024

Image: CoolingPost website | Photo 1: General Regional Police Directorate Of Western Macedonia/ Florinasi Police Headquarters/Border Guard Department Kristallopigis. Photo 2: General Regional Police Directorate Of Western Macedonia/ Florinasi Police Headquarters/Border Guard Department Kristallopigis.

How to set up and manage logbooks for refrigeration, air-conditioning, heat pump and other types of equipment

- Background: This technical brief reflects the Polish experience of setting up and managing logbooks for refrigeration, air-conditioning, heat pump (RACHP) and other types of equipment. It also provides examples of similar equipment databases used in other developed and developing countries. It explains how equipment logbooks and electronic databases can facilitate a smooth hydrochlorofluorocarbon (HCFC) phase-out and hydrofluorocarbon (HFC) phase-down. It also provides guidance on the contents and format of the equipment logbooks, and on how to set up and manage the related databases. The Appendix describes the step-by-step approach for setting up and managing equipment logbooks and the relevant electronic databases. **This factsheet is available in English and Russian**



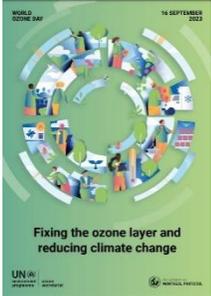
FEATURED

Overview for the meetings of the ozone treaties - Click [here](#) for upcoming and past Montreal Protocol Meetings dates and venues.

Avoided CO₂e - The CO₂e App available from the Ozone Secretariat aims to raise awareness and enhance understanding of the contributions of the Montreal Protocol and its Kigali Amendment to climate change mitigation.



World Ozone Day 2023 theme: Montreal Protocol: fixing the ozone layer and reducing climate change - On World Ozone Day, we celebrate the achievements of the Montreal Protocol on Substances that Deplete the Ozone Layer in fixing the ozone layer and reducing climate change. The theme for the 2023 International Day for the Preservation of the Ozone Layer, to be marked on 16 September, is **Montreal Protocol: fixing the ozone layer and reducing climate change**. This reiterates the recent finding by the Scientific Assessment Panel of the positive impact the Montreal Protocol has on climate change, that ozone recovery is on track and how climate challenges can be supported through the Kigali Amendment.



The theme and other related materials available [here](#) in the six UN official languages.

New gaming technology to create environment simulation game for teenagers-The UN Environment Programme's (UNEP) Ozone Secretariat today launched a simulator game and avatar using the latest software technology. **Apollo's Edition** is the latest addition to the **Reset Earth education platform**. Targeting 13-18-year-olds, the free online education material developed provides educators with resources to teach students the importance of environmental protection.



Online introductory course 'International legal framework on ozone layer protection' - Designed for government representatives and national stakeholders new to the Vienna Convention and Montreal Protocol, students of environmental law, and anyone interested in learning about the ozone treaties, the **online course** launched by the Ozone Secretariat aims to provide an introduction to the international legal framework on ozone layer protection.



Free teaching kits on ozone layer and environmental protection

- New free online teacher toolkits and lesson plans based on the success of UNEP's Ozone Secretariat's **Reset Earth** animation and video game
- Targeting Tweens by adopting animation and gamification to create innovative online lessons to raise awareness on ozone layer and environmental protection
- Available online in digital and print format for universal access



Read/download >>> [Ozone Secretariat's education platform](#)

The UN Environment Assessment Panels

The Assessment Panels have been vital components of ozone protection since the Montreal Protocol was first established. They support parties with scientific, technological and financial information in order to reach decisions about ozone layer protection and they play a critical role in ensuring the Protocol achieves its mandate. The Assessment Panels were first agreed in 1988 to assess various direct and indirect impacts on the ozone layer. The original three panels are:

- **[The Technology and Economic Assessment Panel](#)**
- **[The Scientific Assessment Panel](#)**
- **[The Environmental Effects Assessment Panel](#)**

In the past there were 4 main panels. The Panels for Technology and Economic Assessments were merged in 1990 into one Panel, now called the Technology and Economic Assessment Panel.

Why are the three current panels important to ozone layer protection? Each carries out assessment in its respective field. Every four years, the key findings of all panels are consolidated in a synthesis report. **[Learn more >>>](#)**



The Multilateral Fund for the Implementation of the Montreal Protocol

The Fund is dedicated to reversing the deterioration of the Earth's ozone layer. It was established by a decision of the Second Meeting of the Parties to the Montreal Protocol (London, June 1990) and began its operation in 1991. The main objective of the Fund is to assist developing country parties to the Montreal Protocol whose annual level of consumption of the ozone depleting substances (ODS) chlorofluorocarbons (CFCs) and halons is less than 0.3 kilograms per capita to comply with the control measures of the Protocol. Currently, 147 of the 197 Parties to the Montreal Protocol meet these criteria. They are referred to as Article 5 countries.

The Multilateral Fund is managed by an Executive Committee with equal membership from developed and developing countries. Since the inception of the Fund, the Executive Committee has held 93 meetings. The Fund Secretariat, located in Montreal, assists the Executive Committee in its tasks. Projects and activities supported by the Fund are implemented by four international implementing agencies and a few bilateral agencies.

On 27 October 2023, the Thirty-Fifth Meeting of the Parties to the Montreal Protocol (35thMOP) decided on the replenishment of the Multilateral Fund for the triennium 2024-2026. The Parties agreed on a budget of US \$965 million for the triennium, a record amount.

As at 8 November 2023, the contributions received by the Multilateral Fund from developed countries, or non-Article 5 countries, totalled over US\$ 4.7 billion. The Fund has also received additional voluntary contributions amounting to US \$25.5 million from a group of donor countries to finance fast-start activities for the implementation of the HFC phase-down.

To facilitate phase-out by Article 5 countries, the Executive Committee has approved 144 country programmes, 144 HCFC phase-out management plans (HPMPs), 24 Kigali HFC implementation plans (KIPs), pilot projects to maintain and/or enhance energy efficiency in the context of HFC phase-down, and has funded the establishment and the operating costs of ozone offices in 145 Article 5 countries.

New and updated guides and submission forms for the preparation of project proposals:

- Guide for funding requests for preparation of national inventories of banks of used or unwanted controlled substances and a plan for the collection, transport and disposal of such substances >>>
- Updated interim guide for the presentation of stage I of Kigali HFC implementation plans (July 2023) >>>
- Updated guide for the presentation of new stages of HCFC phase-out management plans (July 2023) >>>

All guides and submission forms are available [here](#)

- Click [here](#) for the Executive Committee upcoming and past Meetings and related documents.



OzonAction Compliance Assistance Programme produces and outreaches a wide variety of information and capacity building materials and tools that support the implementation of the Montreal Protocol programs and assist Article-5 countries in meeting the compliance targets. These include publications, technology briefs and factsheets, mobile applications, videos, e-Learning, modelling, and database programs and special educational or certification programs.

The section below features several of our most recent products.
Visit [OzonAction website](#) for more information, discover the entire range of products.

OzonAction: Celebrating International Women's Day, 8 March 2024 - on the occasion of **International Women's Day (IWD)**, UNEP OzonAction would like to express our best wishes and sincere thanks to all our female colleagues working in National Ozone Units for your leadership, outstanding dedication, great intellectual input, and tireless work on the Montreal Protocol! This treaty is often referred to as the most successful multilateral environmental agreement to date, and both women and men take equal credit in making this amazing achievement possible. OzonAction is extremely proud of all the female **Ozone Officers, Assistant Ozone Officers, technical experts, and support staff**, as well the women in national stakeholder groups and partner organizations, notably those in the **refrigeration, air conditioning, and customs**. Through your work, you are providing girls and young women who are interested in pursuing careers in environmental protection with a role model by showing them that there are successful women in Montreal Protocol fields – you are indirectly investing in their future. [...]



- **Miruzza Mohamed: A Woman Behind the Maldives' Environmental Transformation**
- **Samira de Gobert: Leading Change in Environmental Communication and Women's Empowerment**
- **Colleen Keyworth - From Family Roots to Industry Beacon: Leading Advocate for Women in HVACR**
- **Laura López: Impulsando la implementación del Protocolo de Montreal y la equidad de género en Guatemala**
- **Marta Pizano: A trailblazer's path from research to global policy**
- **Liazzat Rabbiosi: A Woman Facilitating International Environmental Policy-making**
- **Cecilia Mercado: Breaking Barriers-A legacy of environmental leadership and empowerment**
- **Sarah Nakanyika: A Woman Leading Cooling Advancement in Zambia**
- **Yvette Gauthe Boko: Une femme forte à la tête du Bureau national de l'ozone au Bénin**

Considerations for establishing national HFC Quota System - As HFC consumption in most countries is determined by their import, this document aims to highlight guiding principles and key aspects that countries need to consider when developing their import quota system. The underlying principles and approaches are equally applicable for production and export quota allocation. [Read/download the full document](#)



Every Action Counts: Kigali Amendment - UNEP 2022 - This brochure targets the general public and explains in a simplified manner what the Montreal Protocol and its Kigali Amendment signify. It includes some actions that everybody can do to support the Kigali Amendment. It also covers the relationship between the Kigali Amendment and Sustainable Development Goals. It introduces some examples of successful communication campaigns on the Kigali Amendment. [English](#) / [Spanish](#)



Gender Mainstreaming in the Montreal Protocol: Experiences in Latin America and the Caribbean -Taking into account that women and girls constitute half of the world's population and, therefore, represent half of the potential and innovation necessary to face the “triple planetary crisis” – climate change, nature and biodiversity loss, pollution and waste –, positioning people and the planet as central pillars of the transformation necessary to overcome it, and considering the guiding principles and the scopes of action of the Operational Policy on Gender Mainstreaming of the Multilateral Fund, the United Nations Environment Programme (Latin America and the Caribbean Office). [English](#) / [Spanish](#)



Refrigeration, Air-Conditioning, and Heat Pumps (RACHP) Associations & Organizations: This Knowledge Map provides a global directory of RACHP associations, societies, and organisations around the world. These are key stakeholders for ensuring safe and efficient refrigerant transitions.

Local Technical & Vocational Education and Training (TVET): This Knowledge Map provides a global directory of TVET entities and centres around the world. These are the strategic partners for conducting and promoting training and certification programmes related to the refrigeration servicing sector.



Click [HERE](#) to access the OzonAction Knowledge Maps tool

Click [HERE](#) to download the OzonAction Knowledge Maps tool flyer

Gas Card Tool: Web-based Visual Printable Cards of Refrigerant Gases Content of Gas Cards

Each Gas Card is printable (in PDF or image format) and includes the following information about each substance/gas: a) General Characteristics (Chemical name, formula and type, ASHRAE designation, Trade names, Harmonized System (HS) codes, Chemical Abstract Service (CAS), United Nations (UN) numbers, Blend/ mixture components, Montreal Protocol Annex and Control measures, main usage, etc.) b) Gas Performance—Radar Chart (in terms of: Ozone depleting potential-ODP, Global warming potential- GWP, Toxicity Class & Flammability Class) c) Environmental and Safety Impact, and Safety Impact (with visualization of Toxicity & Flammability Class, Hazardous Symbols). **More Information** - The Gas Card web-based tool is part of UNEP OzonAction's portfolio of activities and tools to assist various stakeholders in developing countries, including customs officers and technicians, to achieve and maintain compliance with the Montreal Protocol on Substances that Deplete the Ozone Layer. In the left navigation bar of the Gas Card tool web page, you will find a list of commonly used HFCs and HFC Blends in different sectors. *



Using the Gas Card web-based tool

- The Gas Card tool is available online on the [OzonAction website](#)
- Read the full [2021 annual iPIC report](#)
- See the [flyer](#) introducing the new iPIC platform

* Based on the Overall Analysis of the Results of the Survey of ODS Alternatives Report (conducted in 119 countries from 2012 to 2015)



HCFC Quota and Licence Tracker - a new desktop application to assist with HCFC licences and quotas

National Ozone Officers have the great responsibility of managing the allocation and monitoring of quotas for substances controlled under the Montreal Protocol. This process can be complex with many importers, especially if the country imports a range of different hydrochlorofluorocarbons (HCFCs) and

mixtures containing HCFCs. To address this challenge, OzonAction developed a new desktop application that helps Ozone Officers with the tasks of planning, calculating, monitoring, and managing consumption quotas and licences. It can be used on a daily basis to track and manage the current year's quota allocations for different importers, or for future planning by trying different scenarios that adjust the type of substances imported, their quantity, or the number of importers. The HCFC Quota and Licence Tracker allows Ozone Officers to see the effect of such scenarios on the national HCFC consumption and helps ensure that the quotas stay within agreed HCFC Phase-out Management Plan (HPMP) targets. For countries that have ratified the Kigali Amendment, in the future OzonAction will extend the tracker to include hydrofluorocarbons (HFCs) once countries begin designing their quota systems for those controlled substances. **Access the:**

- [HCFC Quota tracker app](#)
- [Flyer for more information on the tracker](#)
- [Short video tutorial on the OzonAction YouTube Channel](#)

GWP-ODP Calculator Application - Updated- “Quickly, efficiently and accurately convert between values in metric tonnes, ODP tonnes and CO₂-equivalent tonnes” Data are extremely important for the Montreal Protocol community, and the data reporting formats for both A7 and CP have changed recently, to a large degree triggered by the Kigali Amendment. HFCs, blends, CO₂-equivalent values, etc, now have to be addressed much more frequently by Ozone Officers during their daily work. Sometimes the terminology and values are complex and can be confusing, and it helps to have all the official facts and figures in one place. Conversion formulas need to be applied to calculate CO₂-eq values from both GWP and metric tonne values. This free app from OzonAction is a practical tool for Ozone Officers to help demystify some of this process and put frequently needed information at their fingertips. **What’s new in the app:**



- An updated more user-friendly interface
- Multilingual interface: English, French and Spanish
- A new **Kigali Amendment mode** - in this mode the GWP values used to calculate the refrigerant blends/mixtures only include GWP contributions from components that are controlled HFCs
- Latest updated ODP and GWP values from the recent reports from the Montreal Protocol technology and scientific expert panels as well as the Intergovernmental Panel on Climate Change (IPCC) reports
- References added for sources of all values
- New refrigerant mixtures (with ASHRAE -approved refrigerant designations)

If you already have the application installed on your device, be sure to update to benefit from the new features. The app can be viewed in English, French or Spanish.



Smartphone Application: Just search for “GWP-ODP Calculator” or UNEP in the Google Play store or use the QR code – free to download! If you already have the application installed on your device, be sure to update to benefit from the new features.



Desktop Application: GWP-ODP Calculator is also available online on the OzonAction [website](#)



Watch the new short introductory tutorial **video** on the GWP-ODP Calculator - available now on [YouTube](#)

>>> Read/download the flyer

Updated OzonAction "WhatGas?" Mobile App

The OzonAction 'WhatGas?' application is an information and identification tool for refrigerants gases: ozone depleting substances (ODS), HFCs and other alternatives. It is intended to provide some stakeholders, including Montreal Protocol National Ozone Officers, customs officers, and refrigeration and air-conditioning technicians with a modern, easy-to-use tool that can be accessed via mobile devices or the OzonAction website to facilitate work in the field, when dealing with or inspecting ODS and alternatives, and as a useful reference tool.



This latest release includes the 2022 Harmonized System (HS) Codes for HFCs and blends, which facilitates the process of inspection and identification of controlled and alternative substances.

Scan the QR code to download the app (*currently available for Android devices only*). If you've already downloaded the app, to update visit the [Google Play Store](#)

RAC Technician Videos - Full length films! Two 'full length' videos for refrigeration and air-conditioning (RAC) sector servicing technicians: on 1) **Techniques, Safety and Best Practice** and 2) **Flammable Refrigerant Safety**.

The OzonAction Refrigeration and Air-Conditioning Technician Video Series consists of instructional videos on techniques, security and best practice and flammable refrigerant safety. They are intended to serve as a complementary training tool RAC sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training. The videos are not intended to replace structured formal technician training, but to supplement and provide some revision of tips and skills and to build on training already undertaken.



These videos are based on the successful UNEP OzonAction smartphone application, the RAC Technician Video Series app. This application has been downloaded on more than **86,000** devices since its launch.

Following many requests to make the videos more versatile and better suited to classroom and training settings, OzonAction has responded to this demand and produced two 'full-length' instructional videos.

You may wish to share this message and the flyer with:

- Your national/regional RAC associations
- Training or vocational institutes
- Master RAC trainers in your country
- Any other interested national stakeholders



You can watch these videos on the OzonAction YouTube Channel:

- [Techniques, Safety and Best Practice](#)
- [Flammable Refrigerant Safety](#)



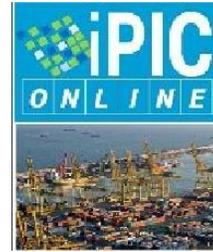
The videos are also available for download by request from UNEP OzonAction:
unep-ozonaction@un.org



If you prefer to access the video clips via the OzonAction smartphone application, just search for "RAC Technician Video Series" or UNEP in the Google Play Store and iTunes/App Store or scan the QR code – **Free to download!**

The flyer is available from the [OzonAction website](#).

OzonAction's iPIC platform - Updated Collaboration between China and Thailand using OzonAction's informal Prior Informed Consent (iPIC) system has resulted in the prevention of a huge consignment of ozone-depleting and climate damaging hydrochlorofluorocarbons (HCFCs). Those chemicals, which are primarily used as refrigerants for air conditioners and fridges, are controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer and are being phased out by all countries according to a specific timeline.



Women in the refrigeration and air-conditioning industry: Personal experiences and achievements The United Nations Environment Programme's (UNEP), OzonAction, in cooperation with UN Women, has compiled this booklet to raise awareness of the opportunities available to women and to highlight the particular experiences and examples of women working in the sector and to recognise their successes. All of the professionals presented in the booklet are pioneers. They are role models whose stories should inspire a new generation of young women to enter the field and follow in their footsteps. **Read/download the publication**

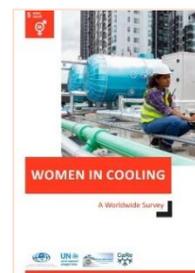


As part of IIR and UNEP OzonAction's partnership, a set of Cold Chain Technology Briefs was released over the past few years, which includes in-depth summaries about the cold chain in different key sectors. They include descriptions of technology, refrigerant options and trends and conclude with prospects and challenges. They cover the main cold chain sub-sectors, i.e., **Production & Processing, Cold Storage, Transport Refrigeration, Commercial & Domestic, and Fishing Vessels**. **Download the Cold Chain Technology brief in English | French | Russian | Spanish**



PUBLICATIONS

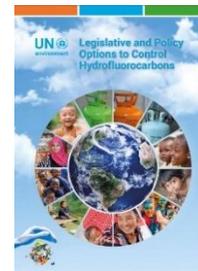
Results of a Worldwide Survey about Women in Cooling Released by IIR and UNEP OzonAction - Refrigeration, Air-Conditioning, and Heat-pumps (RACHP) are crucial for our health, nutrition, comfort, and well-being. It is one of the sectors that crosscuts many of the UN sustainable development goals and can contribute significantly to safeguard the environment, advance welfare of humanity and support the growth of employment and economics worldwide. Women are highly under-represented in this sector as indicated by the fact that only 6% of the members of national refrigeration associations/organisations/institutions are women. In order to better understand the background, motivation, challenges, and opportunities faced by women working in RACHP a worldwide survey was undertaken by the International Institute of Refrigeration (IIR) and OzonAction of UN Environment Programme (UNEP) in cooperation with several partners. **Read/Download the Full Report**



Sustainable Food Cold Chains: Opportunities, Challenges and the Way Forward-This [UNEP-FAO] report explores how food cold chain development can become more sustainable and makes a series of important recommendations. These include governments and other cold chain stakeholders collaborating to adopt a systems approach and develop National Cooling Action Plans, backing plans with financing and targets, implementing, and enforcing ambitious minimum efficiency standards. At a time when the international community must act to meet the Sustainable Development Goals, sustainable food cold chains can make an important difference.



Legislative and Policy Options to Control Hydrofluorocarbons - In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures. This booklet contains a recommended set of legislative and policy options which the developing (Article 5) countries may wish to consider for implementation. It is intended to be a guide/tool for countries. [Read/download](#)



Green Cooling in public procurement How to advance the procurement of climate-friendly and energy-efficient cooling equipment in the public sector? Air conditioning in public buildings is often responsible for around 50% of total electricity consumption. Switching to climate-friendly cooling technologies ("Green Cooling") can reduce costs and energy consumption and improve the carbon footprint of public buildings. This study takes a closer look at the benefits of Green Cooling in the public sector and discusses current barriers and possible solutions. The information presented provides a solid basis to revise current procurement criteria for sustainable cooling systems in public buildings. [Read/Download the study](#)



E-Book on Process Safety Management (PSM) Training for Ammonia Refrigeration - a new e-book about the critical elements of a process safety management (PSM) training program for facilities operating an ammonia refrigeration system.

The e-book, titled "[7 Keys to a Compliant PSM Training Program for Ammonia Refrigeration](#)," outlines important questions a facility's program should address and questions that trained plant personnel should be able to answer. Topics covered include:

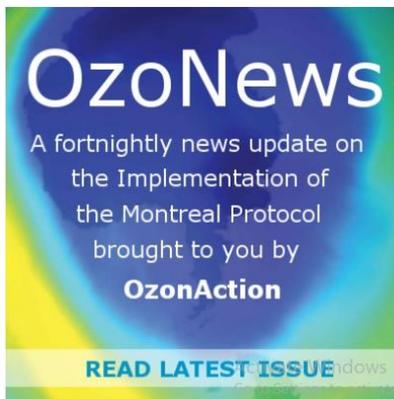
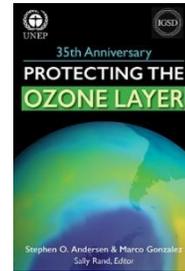
- Safety hazards and health considerations
- Emergency shutdown procedures
- Addressing deviations from system operating limits
- Risks and costs of non-compliance with regulatory standards

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Protecting the Ozone Layer - 35th Anniversary Edition - a new book celebrating the 35th Anniversary of the Montreal Protocol. **The electronic version (Kindle Edition) of the book has become available for purchase \$3.03 on Amazon.** The book highlights successes and documents innovation during the first 35 years and inspires new ambition to strengthen protection of stratospheric ozone and climate before Earth passes tipping points. The book tells the story of the Montreal Protocol, revealing a model of cooperation, collaboration, universal ratification, record of compliance with over 99 per cent of controlled ozone-depleting substances (ODSs) phased out, the ozone layer on the path to recovery, the 2007 Montreal Adjustment, and the 2016 Kigali Amendment moving the Montreal Protocol further into environmental protection. Unfinished business includes: HCFC phase out, ODS bank management, HFC phase down, uncontrolled ozone-depleting greenhouse gas nitrous oxide (N₂O), feedstock exemptions for plastics production, and dumping of obsolete cooling appliances.

The book was released at 34th Meeting of the Parties to the Montreal Protocol on 31 October 2022.



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