

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 country which have ratified the Kigali Amendment:

Bahamas, 30 May 2023

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. World Ozone Day 2023 theme announced: 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.

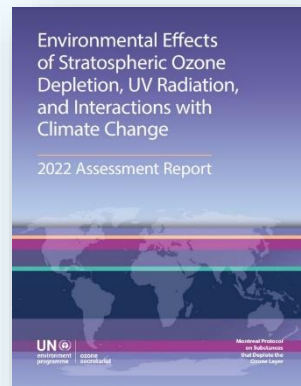
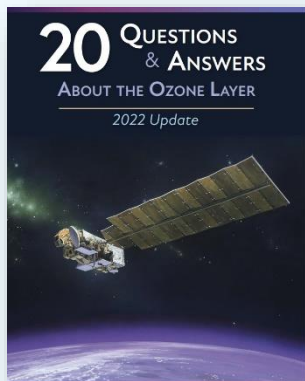
This reiterates the recent finding by the Scientific Assessment Panel of the positive impact the Montreal Protocol has on climate change, that ozone recovery is on track and how climate challenges can be supported through the Kigali Amendment.

[Learn more >>>](#)

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

Image: UNEP, Ozone Secretariat website





3. Interim guide for the presentation of stage I of Kigali HFC implementation plans (May 2023)

The main purpose of preparing Kigali HFC Implementation Plans (KIPs) is the development of an overarching strategy to allow Article 5 countries to meet the reduction targets in HFC consumption,

as agreed by the Parties to the Montreal Protocol in the Kigali Amendment.

The main objective of stage I of KIPs is, in line with the overarching strategy, to develop and implement a plan of action to allow Article 5 countries to meet the freeze in HFC consumption and the 10 per cent reduction from the baseline in accordance with the control schedules established by the Parties, as shown in the table below.

Control measure	Article 5 countries – group 1	Article 5 countries – group 2
Freeze of HFC consumption at the HFC baseline level	1 January 2024	1 January 2028
10% reduction of HFC consumption from the HFC baseline level	1 January 2029	1 January 2032

HFC baselines are calculated in CO₂-equivalent (CO₂-eq) tonnes as the average of HFC consumption levels for the years 2020, 2021, and 2022 for group 1 countries, or 2024, 2025, and 2026 for group 2 countries, plus 65 per cent of the country's HCFC baseline.

At its 87th meeting, the Executive Committee adopted the guidelines for the preparation of KIPs (decision 87/50). Accordingly, the Secretariat has developed the present Guide to assist both Article 5 countries and the bilateral and implementing agencies in preparing and submitting stage I of the KIPs.

The Guide outlines the minimum information that should be included in each section of stage I proposal, including references to the relevant Executive Committee decisions. Indications are provided as to the maximum length of each section. The Guide has been developed taking into account the experience gained in the preparation and implementation of other multi-year

agreements as well as relevant Executive Committee policies, precedents and guidelines developed with respect to individual projects and financial matters.

The present Guide will be updated once the cost guidelines for the phase-down of HFCs are finalised by the Executive Committee. [...]

[The Multilateral Fund for the Implementation of the Montreal Protocol, 25 May 2023](#)

Image: Multilateral Fund

4. World Refrigeration Day 2023 theme announced: Next generation cooling: The future is in our hands

World Refrigeration Day celebrates the people and technologies responsible for creating and maintaining the world we live in, a world dependent upon temperature-controlled environments. Centred around June 26, the event is supported globally by industry, professional groups, scientific and engineering associations, as well as by governments and individuals.

Titled 'Next Generation Cooling', the WRD 23 campaign will focus on the future of cooling technology, the industry, the people working within it, and those that benefit from cooling. Building upon last year's theme 'Cooling Matters', this year's campaign will look forward with the aim of raising awareness of how the modern cooling industry is adapting and evolving to meet the challenges and opportunities the sector faces providing the increasing demand for low carbon cooling and heating solutions in a warming climate.

Next generation cooling is important because it can help reduce the energy consumption and carbon emissions of cooling systems, which are becoming more widely used as the world gets hotter and more humid. For example, according to the International Energy Agency, air conditioners account for nearly 20% of the total electricity used in buildings around the world today, and their use is set to soar over the next three decades, becoming one of the top drivers of global electricity demand.

Supporting next generation cooling solutions is of course the workforce; the people working within the sector. "As an industry, we need to recruit, train and retain people equipped with the knowledge and skills that a modern, forward-thinking industry requires" explains Stephen Gill, founder of World Refrigeration Day. Gill continues "Just as no-one will expect the cooling solutions, we supply in the future to be the same as those from the past, no-one should expect the workforce to be the same either. This year's campaign is an opportunity to showcase what we are doing now to ensure we have the diverse, highly skilled workforce that our future industry needs".



The future is in our hands. Next Generation Cooling will tell the story of how our wellbeing depends upon sustainable cooling and heating, and how cooling technology choices and an evolving industry can safeguard the well-being of future generations.

We encourage the whole refrigeration, air-conditioning, and heat-pump industry to join us in celebrating World Refrigeration Day 2023. Join the global community conversation using the hashtags #NextGenCooling and WREFD23.”

World Refrigeration Day (WRD), 26 May 2023

Image: WRD website



5. International network for women in cooling launches online platform to connect women professionals around the globe

The International Network for Women in Cooling (INWIC) officially launched its web service, available at <http://www.inwic.org>. The website will act as a hub for the organisation and its members with the primary purpose of providing a networking platform for women working in cooling, which broadly covers the heat pumps, ventilation, air conditioning and refrigeration (HVACR).

INWIC President, Colleen Keyworth said "We are excited to announce the launch of the International Network for Women in Cooling (INWIC) website. INWIC is a global community of women who work in the cooling sector, including air conditioning, refrigeration, and heat pump industries. I personally would like to invite all women working in the cooling sector to join INWIC and become part of our global community. As a collective, we have the potential to achieve remarkable feats."

Women who are working or studying in the refrigeration and air-conditioning sectors are encouraged to apply to INWIC through the *Member* level of membership. Members receive exclusive benefits, such as access to a private forum where women can engage with one another and discuss their experiences and challenges of working in the HVACR industries and the upcoming free mentoring programme.

In addition to women in the refrigeration and air-conditioning sectors, other individuals who are interested in supporting this initiative can also become members through the *Affiliates* level of membership.

HVACR associations, societies, and other not-for-profit entities with a role in women's career development may apply for *Partner* membership. Additionally, businesses, corporations, and industry associations and coalitions may apply to become *Industry Supporters*.

Prospective members can apply for their free membership by going to <https://www.inwic.org/membership/> and then selecting Register. Once the registration form is completed, users will receive an email asking them to confirm their email address.

Members of all categories will have access to the networking platform, where they can connect with individuals and organisations via the forum and messaging service. Members will also be able to participate in INWIC related events and activities and stay up to date on the latest INWIC news by subscribing to our newsletter and reading our news section.

For more information, please contact the [INWIC Secretariat](#)

Image: INWIC website



6. Where have all ozone talks gone

THE earth's ozone layer is a shield that protects all lives on the planet from the sun's harmful ultraviolet radiation. By the 1970s, scientists discovered that human-made chemicals such as chlorofluorocarbons were, however, damaging the ozone layer over Antarctica. Chlorofluorocarbons are used in a variety of products, including refrigerators, air conditioners and aerosol cans. When chlorofluorocarbons reach the stratosphere, they break down ozone molecules. This

threatens life on the earth. The international community came together to find ways to protect the ozone layer and their efforts have so far been successful.

THE ozone layer is a crucial part of the atmosphere as it filters out harmful ultraviolet rays that come from the sun. If the ozone layer were to disappear, all three forms of ultraviolet radiation – UV-A, UV-B and UV-C – would enter the earth's atmosphere. This would have a significant impact on living organisms as an excessive ultraviolet radiation can interfere with the DNA and cell division processes in animals and humans, leading to mutation and health issues such as skin cancer, cataracts, and weakened immune responses.

Even with the current ozone layer, we cannot stare directly at the sun for more than 60 seconds without risking blindness. However, with a 100 per cent decrease in ozone, blindness could set in immediately. Additionally, human skin can burn after even less than a day's exposure to the sun's ultraviolet rays. If the ozone layer were removed, the consequences would be catastrophic. In just a few days, most of the animals and plants living would begin to die.

The disappearance of plant life would radically reduce the atmospheric concentration of oxygen and greatly increase that of carbon. The atmosphere would flip, chemically speaking, from a heavy concentration of oxygen to carbon dioxide. This shift in atmospheric composition would have far-reaching consequences on all life forms on the earth.

It is, however, important to note that life may still be able to thrive without the ozone layer. Over time, organisms could evolve traits such as reduced oxygen-concentration requirements and increased cellular resistance to ultraviolet radiation through natural selection and mutation. While life may still be able to survive, the earth's environment and

ecology would be permanently altered. It would take millions of years for the earth to fully recover and life on the earth would never be the same.

In the 1980s, the world faced a massive problem: a rapidly expanding hole in the ozone layer. The sun's ultraviolet radiation is essential to life on the earth, but an excessive exposure to it can harm plant and animal DNA. About 98 per cent of that radiation is, however, absorbed by the ozone molecules dispersed in the stratosphere, which continuously break apart and reform, maintaining a delicate balance. However, in the early 1970s, chemists Mario Molina and Sherwood Rowland discovered that chlorofluorocarbons could disrupt this balance.

Chlorofluorocarbons were invented in the 1920s by three US-based corporations as coolants for refrigerators. Unlike existing alternatives such as ammonia or methyl chloride, chlorofluorocarbons were non-flammable and non-toxic: they were less prone to causing fires or dangerous gas leaks. They were also excellent propellants, foaming agents and fire retardants. Chlorofluorocarbons consequently found their way to a variety of everyday items and became a multi-billion-dollar industry. In the lower atmosphere, chlorofluorocarbons do not break down or react with other molecules.

Molina and Rowland, however, found that in the stratosphere, chlorofluorocarbons are broken apart by ultraviolet light, releasing chlorine atoms. These chlorine atoms react with ozone, destroying it faster than it can be replenished. A single chlorine atom can destroy thousands of ozone molecules before finally reacting with something else and forming a stable molecule. Seeing the threat to the bottom line, chlorofluorocarbon producers pushed back to discredit the scientists, even accusing them of working for the KGB. Initial estimates showed that in 60 years, chlorofluorocarbons could reduce the ozone concentration by 7 per cent. However, by 1985, it became apparent that ozone depletion, especially over Antarctica, was happening much faster.

In Antarctica, the extremely cold temperature and unique structure of Antarctic clouds accelerated the ozone loss. Scientists stationed in Antarctica noticed a significant decline in overhead ozone occurring every spring. Satellite data revealed the vast extent of the losses and chemical tests confirmed that the cause was undoubtedly chlorofluorocarbons.

NASA soon released visualisation of the hole in the ozone layer, which were broadcast around the world and captured public attention. If ozone depletion continued, the rate of skin cancer would skyrocket and photosynthesis would be impaired, making plants – including rice, wheat and corn – less productive and more susceptible to diseases. Global agricultural production would plummet and the entire ecosystem would collapse. But many politicians, weighing immediate economic concerns over long-term ones, disagreed on what to do.

The fight to ban chlorofluorocarbons found two unlikely allies in US president Ronald Reagan and UK prime minister Margaret Thatcher. Despite their general opposition to government regulation, Reagan, who had undergone treatment for skin cancer, and Thatcher, who was trained as a chemist, recognised the need for an immediate action. The United States and the United Kingdom, along with Canada, Norway, Sweden, and Finland, led calls for an international ban on chlorofluorocarbons. In 1987, representatives signed the Montreal Protocol, requiring a rapid phasing out of chlorofluorocarbons and creating a fund to assist global south countries in obtaining affordable, non-ozone-depleting alternatives. It was later ratified by all the countries – the only treaty in history to achieve this. In 1995, Molina, Rowland and their Dutch colleague Paul Crutzen were jointly awarded the Nobel prize in chemistry. As the use of chlorofluorocarbons declined, the ozone hole began shrinking and is predicted to disappear entirely by 2070.

In 1987, the world's first international environmental treaty, the Montreal Protocol, was signed by 24 countries. The protocol aimed at phasing out the production of ozone-depleting substances such as chlorofluorocarbons and halon. The protocol was later strengthened by several amendments, including the 1990 London amendment, which accelerated the phase-out of ozone-depleting substances.

As the phase-out of ozone-depleting substances began, industries and individuals began to search for alternatives. This led to the development of technologies such as hydrofluorocarbons and other chemicals that do not harm the ozone layer. The new technologies were gradually adopted by various industries such as air conditioning and refrigeration.

The success of the Montreal Protocol was due to the international cooperation among governments, scientists and industries. The United Nations Environment Programme and the World Meteorological Organisation played a crucial role in providing the scientific evidence that was needed to support the phase-out of ozone-depleting substances. The cooperation between developed and developing countries was also essential in implementing the protocol.

Although the phase-out of ozone-depleting substances has so far been successful, it is important to continue with monitoring the ozone layer. The UNEP and the WMO continue to monitor the ozone layer through the Global Ozone Observing System and the World Ozone and Ultraviolet Radiation Data Centre. The monitoring has showed that the ozone layer is slowly recovering, and it is expected to return to the pre-1980 levels by the middle of the century.

Public awareness and education played a significant role in tackling the depletion of the ozone layer. The media, non-governmental organisations, and governments all played a part in creating awareness of the issue and encouraging individuals to take action. As a result, individuals began to reduce their use of products that contain ozone-depleting substances such as aerosol sprays.

The depletion of the ozone layer was a major environmental issue that threatened the health and well-being of life on the earth. The international community came together to tackle the problem and their efforts have been successful. The Montreal Protocol and international cooperation among governments, scientists and industries were crucial in phasing out ozone-depleting substances and developing technologies that do not harm the ozone layer. Ongoing monitoring and public awareness and education will continue to remain in maintaining the recovery of the ozone layer.

[New Age, 24 May 2023](#)

Image: New Age website

7. Ozone treaty is delaying first ice-free Arctic summer

A 1987 global deal to protect the ozone layer is delaying the first ice-free Arctic summer by up to 15 years, [new research shows](#).

The Montreal Protocol – the first treaty to be ratified by every United Nations country – regulates nearly 100 man-made chemicals called ozone-depleting substances (ODSs).



While the main aim was to preserve the ozone layer, ODSs are also potent greenhouse gases, so the deal has slowed global warming.

The new study shows the effects of this include delaying the first ice-free Arctic summer (currently projected to happen the middle of this century) by up to 15 years, depending on future emissions.

The researchers – from UC Santa Cruz, Columbia University and the University of Exeter – estimate that each 1,000 tonnes of ODS emissions prevented saves about seven square kilometres of Arctic sea ice.

“While ODSs aren’t as abundant as other greenhouse gases such as carbon dioxide, they can have a real impact on global warming,” said Dr Mark England, Royal Commission for the Exhibition of 1851 senior research fellow at the University of Exeter.

“ODSs have particularly powerful effects in the Arctic, and they played a major role in driving Arctic climate change in the second half of the 20th Century.

“While stopping these effects was not the primary goal of the Montreal Protocol, it has been a fantastic by-product.”

Dr England said opponents of the protocol predicted a range of negative consequences, most of which did not happen, and instead there are numerous documented instances of unintended climate benefits.

Professor Lorenzo Polvani, from Columbia University, said: “The first ice-free Arctic summer – meaning the Arctic Ocean practically free of sea ice – will be a major milestone in the process of climate change.

“Our findings clearly demonstrate that the Montreal Protocol has been a very powerful climate protection treaty, and has done much more than healing the ozone hole over the South Pole.

“Its effects are being felt all over the world, especially in the Arctic.”

The study, which used new climate model simulations, shows that protection of the ozone layer itself played no part in slowing the loss of Arctic sea ice – all the benefits relate to the role of ODSs as greenhouse gases.

ODSs (which include chlorofluorocarbons, also called CFCs) are compounds developed in the last century for industrial use as refrigerants and propellants.

The Montreal Protocol, which has now been signed by all 198 members of United Nations, regulated these compounds to preserve the ozone layer, which protects humans and the environment from harmful levels of ultraviolet radiation.

This effort has succeeded, with atmospheric concentrations of ODSs declining since the mid-1990s and signs that the ozone layer has started to heal.

However, research has suggested a slight rise in ODS concentrations from 2010-20, so Dr England said vigilance is still required.

University of Exeter, 23 May 2023, by Alex Morrison

Image: University of Exeter website

See also >>>

- [Alarming findings – Emissions of banned ozone-destroying chemicals on the rise](#)
- [Vaunted treaty to protect the ozone layer has a hole](#)
- [Scientists call for chemical pollution monitoring in Antarctica to support global chemical policy](#)



8. Scientist calls for use of natural refrigerants in ice slurry systems on Fishing vessels

Though ice slurry refrigeration systems offer many advantages for the fishing industry, there are few ice slurry systems installed on fishing vessels that use ammonia (R717) or CO₂ (R744) for ice slurry systems.

That was the assessment delivered by Kristina Widell, Senior Research Scientist at SINTEF Ocean, at the 10th International Institute of Refrigeration (IIR) conference, held in Ohrid, North Macedonia, April 27–29. She spoke on behalf of the CoolFish Project, funded by the Research Council of Norway, to provide a sustainable solution for chilling Norwegian seafood and reducing CO₂e emissions.

While the potential for development is evident, the current lack of market interest in natural refrigerant solutions in the fishing industry hinders its progress. “There is an urgent need to address refrigerant leakage and transition to natural refrigerants in onboard fishing vessels since the use of high-GWP refrigerants is hindering progress towards sustainability,” Widell said.

Efforts are needed to raise awareness and foster industry-wide collaboration “to unlock the full potential of ice slurry system in seafood preservation in the fishing industry,” she said.

The most efficient chilling rate

Widell believes that an ice slurry system provides “the most efficient chilling rate along with an option of cold thermal energy storage,” said Widell. Other ways of chilling fish onboard include ice storage and refrigerated seawater (RSW).

Ice slurry systems require a refrigeration system connected to an ice slurry generator, a storage tank for the produced slurry and possibly a mixing device to correct the water/ice ratio.

Ice slurry offers distinct advantages over flake ice in seafood chilling, said Widell. Comprised of small, microscopic ice crystals, slurry effectively fills the gaps between fish, facilitating enhanced heat flow and resulting in a high chilling rate.

Unlike water, slurry aims to harness the latent heat stored within the ice crystals. Control over latent heat can be achieved by producing slurry with a specific ice fraction or concentration. By capitalizing on these features, slurry ensures optimal heat transition and provides a more efficient and controlled environment for seafood preservation, said Widell.

Thus, ice slurry systems offer significant advantages in fish preservation, including rapid cooling, gentle handling, extended shelf life and improved product quality. The slurry-chilled fish exhibit better microbial conditions, enhanced water binding capacity, improved texture and increased freshness.

In addition, the pumpability of ice slurry ensures easy transportation and distribution, streamlining the chilling process.

“Studies conducted on various fish species, such as European hake, farmed turbot, perch, horse mackerel, salmon and cod, have consistently shown superior quality parameters when utilizing the slurry system,” said Widell.

R744, 16 May 2023, by Saroj Thapa

Image: R744 website / Kristina Widell of SINTEF Ocean, speaking at the IIR Conference in Ohrid, North Macedonia

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).

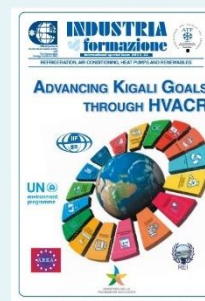


Watch out for illegal trade of HCFCs and HFCs:
Lessons learnt from the Global Montreal Protocol Award for Customs and Enforcement Officers

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.



[Advancing Kigali goals through HVACR - International Special Issue 2022- 2023](#) - To provide an update on this global effort, The Centro Studi Galileo (CSG) and the Renewable Energy Institute (REI), with support from the International Institute of Refrigeration (IIR), The United Nations Environment Programme-OzonAction, (UNEP- OzonAction) and The Air conditioning and Refrigeration European Association (AREA), Ministero Della Transizione Ecologica, have collected experiences from around the world, compiled in this special publication, featuring papers from leading global institutions and experts, addressing the current situation, the challenges ahead, and sharing opinions from different National Ozone Units, on issues related among others to HVAC&R, training, and the role of women in the cooling industry.



[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



1 exhibit

On site post-harvesting and/or precooling applications



6 exhibits

Storage of product, e.g. large warehouses / Distribution centers



0 exhibits

Storage on board ships, aircraft, and containers



4 exhibits

Food processing plants



1 exhibit

Transport (large and smaller trucks, smaller containers)



6 exhibits

Supermarkets (wholesale markets & Retailers)



1 exhibit

Food services (Restaurants, cafes, tourism facilities, etc)



2 exhibits

Vaccines and other pharmaceutical products



0 exhibits

Game-changing and systemic approaches

AFRICA



9. Trainers, technicians and dealers in refrigeration and air conditioning trained in green cooling

Several treaties on the control and elimination of substances that contribute to global warming have been signed worldwide. These include the Vienna Convention for the protection of the ozone layer, the Montreal Protocol on substances that deplete the Ozone layer, the Kyoto Protocol, and most recently, the Kigali Amendment to the Montreal Protocol.

Within these treaties, it is commonly held that while refrigerants play a critical role in modern cooling systems, their impact on the environment and safety is substantial and must not be overlooked. There is also a growing interest in natural refrigerants such as propane, butane, and carbon dioxide as alternatives to conventional synthetic options. These natural refrigerants offer low environmental impact but must be handled carefully, due to their combustible nature.

In recognition of these advancements and to build capacities on the safe handling and use of natural refrigerants, the Green Cooling Initiative, supported by the GIZ Global Carbon Markets Program, and commissioned by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection held a training of trainers, technicians and dealers from 8 to 12 May 2023 at Kyambogo University, Kampala. The training was implemented together with the National Environmental Management Authority (NEMA), Kyambogo University, and Uganda National Association of Refrigeration and Air Conditioning (UNARA).

The training, attended by over 16 national technical institution instructors, private sector dealers, and technicians, imparted theoretical and practical teachings on refrigeration and air conditioning. Topics included:

- Tools and safety, use of pressing connectors, worksite preparation, and inert gas brazing demonstration,
- Flammable gas cylinder handling, regulations, safety standards and guidelines, procedures, tools, and equipment, and
- Installation, commissioning, and servicing of ACs that use R290 refrigerant/propane, which though energy efficient and environmentally friendly, is highly flammable.

The trainees also engaged in preparation for installation, routing, and supporting refrigerant transfer pipes, insulation of tubing commissioning, and repair or modification of a system.

The training focused on these key areas because natural refrigerants have gained prominence as sustainable alternatives due to their low global warming and zero ozone depletion potential. Hydrocarbons such as propane and butane further offer excellent thermodynamic properties, energy efficiency, and low environmental impact.

Speaking at the closing ceremony, where participants received training certificates, Dr. Maureen Ssempijja, the Head of the Mechanical and Production Engineering department, Kyambogo University, who is also the President UNARA emphasized the importance of practical training in the Refrigeration and Air Conditioning (RAC) sector and urged the certified trainees to always implement best practices in handling flammable refrigerants, so as to ensure that they themselves and users can use them safely.

[GIZ Uganda, 25 May 2023, by Anthony Orit](#)

Image: GIZ Uganda Website

See also >>> [Cool Training empowers 15 refrigeration technicians from francophone Africa, 26 May 2023, GIZ, the Green Cooling Initiative](#)

10. NAFDAC warns against sale of prohibited refrigerant gases, threatens prosecution

The National Agency for Food and Drug Administration and Control (NAFDAC) has warned gas dealers against selling prohibited refrigerant products responsible for ozone layer depletion.

Festus Ukadike, NAFDAC deputy director, agrochemicals and controlled chemicals division, chemical evaluation and research directorate, gave the warning on Wednesday after a raid of gas shops at Ebute-Metta area of Lagos.

Ukadike said NAFDAC must certify those that must trade in refrigerant gases either as importers or retailers.

He said prohibited refrigerant gases included R124, R406, R123 and R12. "These are banned refrigerant gases, and nobody should be allowed to bring them into Nigeria. You will not be permitted; you will not be certified to deal in them," NAN quoted him as saying.

"If you are found with them, you will be arrested and prosecuted. The operation carried out on Wednesday is part of the agency's efforts to bring everybody involved in chemicals into regulation.

TheCable
www.thecable.com.ng

NAFDAC warns against sale of prohibited refrigerant gases, threatens prosecution



“The operation was targeted at stakeholders, people that deal in chemicals, especially refrigerant gases. We visited their shops to ensure we bring them into regulation.

“We want to know what they are doing or selling, especially those who do not have Listing Certificate; those without a permit to import or sell chemicals.”

Ukadike said no one was arrested during the raid and that the traders assisted NAFDAC officials to carry out the inspection of shops visited.

He said the traders union agreed to visit NAFDAC to establish areas they were to operate and chemicals not to deal in.

Ukadike said the agency would continue to educate and enlighten the traders on the risks involved in trading banned chemicals and gases.

Arize Chuke, chairman of the cooling parts association, Ebute-Metta mainland area, said his members appreciated the visit by NAFDAC officials. Chuke stressed that NAFDAC should constantly educate members of the association on banned chemicals and gases. “Most of us are traders; we do not know about this listing certificate NAFDAC talked about. We only plead with the agency to always educate us and give us seminars on products we are dealing in,” he said. “We want to know banned products; we want to know the ones in vogue. If we know all these, we will do the right thing.

“As traders, we buy from importers. We do not know the risks involved and we want to know. “We are going to the NAFDAC office to meet with its officials so that all of us will be on the same page.”

[The Cable, 24 May 2023, by Jesupemi Are](#)

Image: The Cable Website

WEST ASIA

11. UAE Ministry of Climate Change and Environment issues Decree on regulation of Hydrofluorocarbons

DUBAI, 15th May, 2023 (WAM) -- In alignment with its duty to develop solutions and regulations to combat climate change, enhance air quality, and safeguard the environment, the UAE Ministry of Climate Change and Environment issued Decree No. (138) of 2023. This decree pertains to



وزارة التغير المناخي
والبيئة

regulating the use and distribution of Hydrofluorocarbons (HFCs) in the country, aiming to control their circulation and prevent their emission into the atmosphere.

This decree is established within the context of the Year of Sustainability, aligning with the UAE's preparations to host the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28) this year. Hydrofluorocarbons (HFCs), often referred to as refrigerant gases, are classified among greenhouse gases that intensify global warming and affect the ozone layer. Hence, this decree is a significant step in the UAE's endeavor to uphold its obligations towards climate change mitigation and curbing harmful emissions.

The regulations outlined in this decision are applicable across the UAE, encompassing all free zones and entities engaged in HFC-related activities. As per the decision, all such establishments must adhere to several procedures. These include registering with the Ministry of Climate Change and Environment, providing the establishment's commercial or industrial license, obtaining a warehouse license, and reporting the annual quantities of Hydrofluorocarbons (HFCs) imported over the past three years.

Moreover, they must secure a permit from the ministry to manufacture, import, export, re-export, or transit HFCs or recycled or reclaimed materials derived from HFCs, following all necessary approvals from local authorities.

The decree also stipulates that establishments must submit to the ministry quarterly reports detailing the quantities of hydrofluorocarbons sold, utilized, and remaining in stock. They also need to secure prior consent from the relevant authority when disposing of waste hydrofluorocarbons and equipment containing them. For transboundary disposals, establishments must adhere to the obligations of the signatory nations under the Basel Convention, which governs the control of cross-border movements of hazardous wastes and their disposal.

This decree aligns with the UAE's commitments under the Vienna Convention and the Montreal Protocol concerning substances that deplete the ozone layer. Since joining the Convention in 1989 and the Protocol in 1990, the UAE has been at the forefront of efforts to restore the ozone layer's protective capacity against harmful ultraviolet rays that affect human health and the environment.

Cooling systems account for 7% of global greenhouse gas emissions, and projections suggest a significant increase in these emissions by 2050 due to the escalating average temperature of the Earth.

The measures adopted under this new law concentrate on establishing legislation and guidelines to regulate the use of ozone-depleting substances and monitor their import and export. Through its unaided efforts, the UAE has successfully met its commitments to completely prohibit chlorofluorocarbons and halons by the prescribed deadline in 2010.

Moreover, the nation is progressively phasing out the use of HFCs in compliance with the quotas and timelines established at the nineteenth meeting of the Parties, intending to ban them entirely by 2040.

Emirates News Agency (WAM), 15 May 2023, by Tariq Al Fahaam / Muhammad Aamir

Image: WAM Website

LATIN AMERICA AND CARIBBEAN

12. Implementamos tecnología de aire acondicionado amigable con el medio ambiente



En una ceremonia realizada el 23 de mayo, nuestro Hospital [Hospital Santiago Oriente, Chile] dio un importante paso al inaugurar un nuevo sistema de aire acondicionado, el cual destaca por su bajo impacto ambiental y su contribución en la lucha contra el calentamiento global sin dañar la capa de ozono. A la ceremonia asistió la Ministra del Medio Ambiente, Maisa Rojas.

Gracias a su avanzada tecnología, este climatizador logra una mayor eficiencia energética, lo que se traduce en un consumo más responsable y eficiente de los recursos disponibles.

El sistema de aire acondicionado cubre una superficie de 20.000 m² en áreas altamente sensibles del hospital, como los pabellones quirúrgicos, de recuperación postoperatoria, ginecoobstétricos, de recuperación obstétrica, de parto, UCI adulto, neonatología, esterilización, sedile (preparación de mamaderas para recién nacidos) y urgencias médicas.

Su implementación fue posible gracias a la licitación pública realizada por la Unidad Ozono del Ministerio del Medio Ambiente, con financiamiento del Fondo Multilateral del Protocolo de Montreal y el apoyo de la Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI) como agencia implementadora.

El proceso de cambio se llevó a cabo durante el mes de abril y la puesta en marcha comenzó en la primera quincena de mayo. Con este logro, el Hospital Santiago Oriente Dr. Luis Tisné Brousse se convierte en el primer centro de salud en implementar tecnologías de bajo impacto ambiental en su sistema de climatización.

La Ministra del Medio Ambiente, Maisa Rojas, estuvo presente en la inauguración y destacó los beneficios significativos de este nuevo sistema, afirmando que «no solo ayuda al cuidado de la capa de ozono, sino que también aborda la crisis del calentamiento global. Además, su eficiencia energética es notable, lo que significa que la inversión se amortiza en tan solo 5 años».

El director del hospital, Dr. Julio Montt, expresó: «Estamos orgullosos de ser un establecimiento que está en constante búsqueda de disminuir los agentes contaminantes. Este Chiller viene a contribuir en esta línea, ya que entregará cobertura de climatización en

áreas muy sensibles. Además, esta tecnología amigable para la capa de ozono y el clima otorga mejor eficiencia energética y reemplaza un equipo obsoleto, que ya tenía 21 años»

Con la implementación de este sistema de aire acondicionado de bajo impacto ambiental, el Hospital Dr. Luis Tisné Brousse demuestra su compromiso con la protección del medio ambiente y el bienestar de sus pacientes y personal. Su ejemplo destaca la importancia de adoptar tecnologías sostenibles en los centros de salud, contribuyendo así a la capa del planeta y al cuidado de la salud de todos.

[Hospital Santiago Oriente, Chile, 23 de mayo de 2023](#)

Images: Hospital Santiago Oriente, website

NORTH AMERICA



13. USEPA GreenChill webinar: Refrigerant management solutions

Date and Time: 8 June 2023 at 2 – 3 PM Eastern

Description: Food retail facility owners and operators are facing an array of regulatory mandates, alternative refrigerant solutions, and codes and standards that must be reconciled with the needs of the business. Presenters from DC Engineering will provide insights on refrigerant management strategies for both existing and new equipment as well as compliance planning as a way of reducing refrigerant leak rates.

[>>> Register Now!](#)

EUROPE & CENTRAL ASIA



14. INVITATION to join the 20th European Conference on The Latest Technologies in Refrigeration, Air Conditioning and Heat Pumps

Refrigerants, Heat Pumps, Cold Chain, Environment, Energy, Training, Certification, Legislation, Standards, Safety

8-9 June 2023, Milano, Italy

Organised by Centro Studi Galileo in association with global leading researchers and experts, under the auspices of the Italian Ministry for the Environment.

[Learn more >>>](#)

15. Romanian police seize more refrigerant

Customs officers in Romania continue to intercept illegal refrigerant being smuggled into the country from Ukraine.

Over the last three days, border guards and customs workers at the Vicovu de Sus border crossing point in Suceava have found over 150 refrigerant cylinders in two separate minibuses travelling in from Ukraine.



On Thursday (May 11), officers discovered 144 refrigerant cylinders, along with 373.8 litres of alcohol in a Mercedes-Benz minibus driven by a Ukrainian national. Then, yesterday (May 13), officers discovered nine cylinders of refrigerant onboard a Mercedes-Benz Vito, registered in Ukraine and driven by a Portuguese citizen.

The authorities have not released details of any of the refrigerants found but photographs suggest it included R134a, R410A and possibly R32.

The border police have filed a criminal case against both men for the crimes of attempted smuggling and transportation and transit of dangerous substances and preparations.

Customs officers have previously been criticised for failing to tackle the illegal trade in HFCs. In 2021, the London-based Environmental Investigation Agency (EIA) accused enforcement authorities in Romania of “alarming complacency” after naming the country as a major illegal EU entry point for Chinese-made refrigerants. In 2020, Romania set maximum fines of €6,000 for breaches of the F-gas regulation 517/2014 after the European Commission sent letters of formal notice for failing to adopt penalties.

[CoolingPost, 14 May 2023](#)

Image: CoolingPost website / Politia de Frontiera Romana

See also [>>> Freon în valoare de 6.200 lei, depistat în PTF Vicovu de Sus, 29 Mai 2023, Politia de Frontiera Romana. \(In Romanian language\)](#)



To be organised by the French Association of Refrigeration (AFF) under the theme “[Towards Efficient, Controlled and Smart Refrigeration](#)”, the 26th IIR International Congress of Refrigeration will be held in Paris, France, 21-25 August 2023.

This international event will bring together scientific and technical experts in all fields of refrigeration from across the globe, to provide perspectives on the future of the industry in line with sustainable development. [Learn more >>>](#)

FEATURED



Summary of the 34th Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (MOP34), 31 October – 4 November 2022 | Montreal, Canada

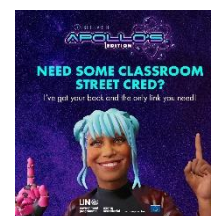
- Read/Download the [full report](#)
- pre/post documents, United Nations Environment Programme (UNEP), Ozone Secretariat [MOP-34](#)
- [Daily highlights](#) Earth Negotiations Bulletin-International Institute for Sustainable Development (IISD) / [Presentations and statements](#) / [Side events](#)



Image: ENB-IISD website

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

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.



[United Nations Environment Programme \(UNEP\), Ozone Secretariat](#)

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](#)

Images: UNEP, Ozone Secretariat website

[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:

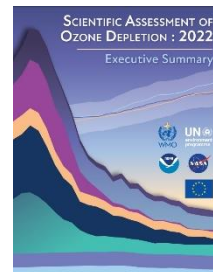
- [The Technology and Economic Assessment Panel](#)
- [The Scientific Assessment Panel](#)
- [The Environmental Effects Assessment Panel](#)

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 >>>](#)

Scientific Assessment of Ozone Depletion: 2022 - [Executive Summary](#)

[United Nations Environment Programme \(UNEP\), Ozone Secretariat](#)



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 91 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.

Last 16 July 2022, following the adoption of interim budgets for the Multilateral Fund due to the Covid-19 pandemic, the Fifth Extraordinary Meeting of the Parties to the Montreal

Protocol (5th ExMOP) decided on the replenishment of the Multilateral Fund for the triennium 2021-2023. The Parties agreed on a budget of US \$540 million for the triennium.

As at 5 December 2022, the contributions received by the Multilateral Fund from developed countries, or non-Article 5 countries, totalled over US\$ 5.02 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 and has funded the establishment and the operating costs of ozone offices in 145 Article 5 countries.

Latest News and Announcement:

- [Executive Committee Primer – 2023](#), An introduction to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, 24/4/2023
- [Policies, Procedures, Guidelines and Criteria of the Multilateral Fund \(Dec 2022\)](#), 3/30/2023
- [Framework of activities for sustainability supported by the Multilateral Fund](#), 3/22/2023

Upcoming events:

- The [92nd meeting](#), 29 May to 2 June 2023, in Montreal, Canada
- The [93rd meeting](#) is scheduled for 11 to 15 December 2023, in Montreal, Canada

>>> 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.

Images in this section are by OzonAction

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 Gard web-based tool

- The Gas Gard 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- This OzonAction 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](#)

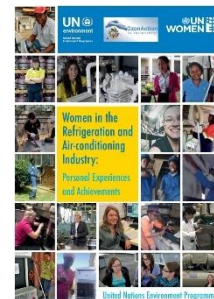
 The videos are also available for download by request from UNEP OzonAction: unep-ozonaction@un.org



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](#).

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 weld and follow in their footsteps. Read/download the [publication](#)

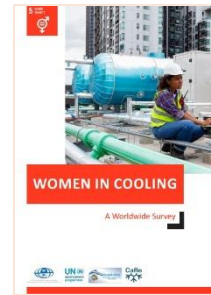


As part of IIR and UNEP OzonAction's partnership, a set of Cold Chain Technology Briefs was released over the past few years, which includes in-depth summaries about the cold chain in different key sectors. They include descriptions of technology, refrigerant options and trends and conclude with prospects 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](#)

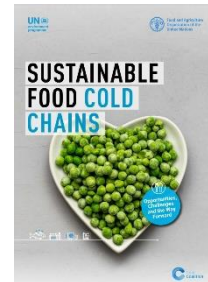


PUBLICATIONS

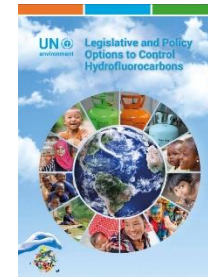
Results of a Worldwide Survey about Women in Cooling Released by IIR and UNEP OzonAction - Refrigeration, Air-Conditioning, and Heat-pumps (RACHP) are crucial for our health, nutrition, comfort, and well-being. It is one of the sectors that crosscuts many of the UN sustainable development goals and can 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.



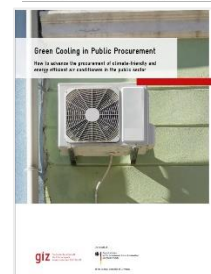
Legislative and Policy Options to Control Hydrofluorocarbons - In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures. This booklet contains a recommended 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



Latest issue of Centro Studi Galileo magazine, **Industria & Formazione**, n. 10-2022 (in Italian).



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



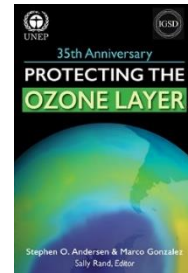
E-Book on Process Safety Management (PSM) Training for Ammonia Refrigeration - a new e-book about the critical elements of a process safety management (PSM) training program for facilities operating an ammonia refrigeration system.

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

Request free Download [here](#)

[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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The views expressed in articles written by external authors are solely the viewpoints of those authors and do not represent the policy or viewpoint of UNEP. While UNEP strives to avoid inclusion of misleading or inaccurate information, it is ultimately the responsibility of the reader to evaluate the accuracy of any news article in OzoNews. The citing of commercial technologies, products or services does not constitute endorsement of those items by UNEP.

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Prepared by: Samira Korban-de Gobert
Reviewed by: James S. Curlin

If you wish to submit articles, invite new subscribers, please contact:
Samira Korban-de Gobert, samira.degobert@un.org



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