

# 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:

**Republic of Korea, 19 January 2023**

**Indonesia, 14 December 2022**

**Venezuela (Bolivarian Republic of), 5 December 2022**

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](#)

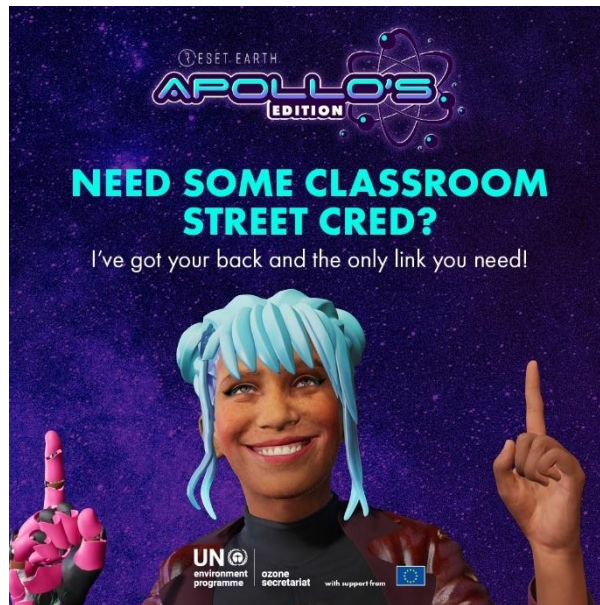
*Image: UN Treaty Collection website*

## 2. UN uses new gaming technology to create environment simulation game for teenagers

**NAIROBI, 24 January 2023** – 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.

### Avatar in the Metaverse

The Ozone Secretariat has used cutting-edge motion capture technology to bring their new Reset Earth character, Apollo, to life. With the aim of creating a strong connection between the character and the audience, a live actor’s body movements and facial expressions were captured by a motion-capture



suit with 17 sensors and headset technology for a truly human portrayal of body language and facial expression.

This technology, along with a powerful real-time 3D creation tool, has produced not only a realistic animated character, but her very own metaverse where she spends her time vlogging about an array of educational topics based on scientific research. For Reset Earth, the focus is on the ozone layer, and in particular, education material available for teachers to educate their students.

### **Students become the decision makers**

The Reset Earth [Impact Simulator game](#) puts the students in the hot seat. As decision makers, they get to decide on four possible policy directions, all of which have specific outcomes documented and visualised by the game. Based on their understanding of the ozone layer, its function and importance, the impacts of their decisions on the environment, society, economy, and political hegemony are recorded and scored.

“By giving young people innovative learning tools, we hope to inspire them to become the future scientists and policymakers championing environmental protection,” said Meg Seki, Executive Secretary of the Ozone Secretariat.

### **Lesson guides and student workbooks**

Teachers can mix and match the lesson contents as they see fit and appropriate for their classes. Tools include short videos, class activities to stimulate debate and individual project tasks. The lessons are a flexible learning tool to incorporate ozone layer and environmental protection into existing curriculums.

### **Increasing awareness among the climate champions of the future to Reset Earth**

Apollo’s Edition is the latest addition to the [Reset Earth education platform](#), complementing the [Reset Earth animation, mobile game app](#) and lesson plans for tweens. While the ozone layer is on a [path to recovery by mid-century thanks to the efforts of the Montreal Protocol, the successes achieved so far could easily be undone](#). By banning ozone-depleting chemicals such as chlorofluorocarbons (CFCs), which are also greenhouse gases, the Protocol helped protect the global climate and carbon sinks. The decline in emissions of ozone depleting substances avoids a rise of an estimated 0.5 to 1 degree Celsius by mid-century.

To reset Earth, future generations need to be aware of the importance of the ozone layer, why its protection is critical to stem increasing climate change and protecting the planet. A fully ratified Kigali Amendment that bans hydrofluorocarbons (HFCs), potent climate warming gases, the world could avoid 0.3 to 0.5 degrees Celsius of warming by the end of the century. But only if the commitment to protecting the ozone layer and the environment is sustained.

Informed minds are powerful minds. The launch today of Apollo’s Edition can help inform and shape the global environment champions of the future and help them Reset Earth.

**[The UN Environment Programme’s \(UNEP\) Ozone Secretariat, 9 January 2023](#)**

*Image: UNEP Ozone Secretariat website*

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### **3. Four reasons why the world needs to limit nitrogen pollution**

Nitrogen is an abundant element in the Earth's atmosphere. It makes the sky blue, forms the foundation of proteins in our bodies and helps make soils fertile.



However, excess nitrogen in the environment in a reactive form – which comes from the use of synthetic fertilizers, the discharge of wastewater or the combustion of fossil fuels – is a hazard, polluting land, water, and air. It also exacerbates climate change and depletes the ozone layer, which is finally recovering.

The United Nations Environment Program's (UNEP's) 2018-2019 Frontiers Report called nitrogen pollution one of the most important pollution issues facing humanity.

This week, officials from around the world gather online to discuss how countries can better manage nitrogen. The talks, supported by UNEP, took place on 17 January. They are designed to facilitate the implementation of two sustainable nitrogen management resolutions passed by the United Nations Environment Assembly, the world's highest-level decision-making body on the environment.

"Nitrogen is a primary nutrient essential for the survival of all living organisms on Earth," said Leticia Carvalho, the Principal Coordinator of the Marine and Freshwater Branch at UNEP. "But the world needs to wake up to the issues of nitrogen waste and the opportunities to take joint action for its sustainable use."

Here are four reasons why humanity needs to limit nitrogen pollution.

- 1. Nitrogen pollution is disrupting life on land and underwater**
- 2. Nitrogen is a key contributor to climate change**
- 3. Nitrogen pollution is a threat to human health**
- 4. Nitrogen waste weighs on the economy**

According to UNEP's 2018-2019 Frontiers Report, nitrogen costs the global economy between US\$340 billion and US\$3.4 trillion annually when taking into account its impact on human health and ecosystems. Most of the UN's Sustainable Development Goals, humanity's blueprint for a better future, are linked with sustainable nitrogen management. Experts say that using the element more efficiently in food production is key to reducing the surplus nitrogen released into the environment.

UNEP is working with scientists and other stakeholders, with the support of the Global Environment Facility, to lower the impact of nitrogen on the planet. [...]

**[The UN Environment Programme's \(UNEP\), 16 January 2023](#)**

*Image: UNEP website - Getty/Jetvic*

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#### 4. Partners announce new ambition on sustainable cooling for COP28

**Abu Dhabi, 16 January 2023** – As the Earth warms at a dangerous pace, the UN Environment Programme (UNEP)-led **Cool Coalition**, with the United Arab Emirates' incoming presidency of

COP28, announced the development of a Global Cooling Pledge and a "Cool COP Menu of Actions" that will feature prominently at COP28. The Menu will be defined over the coming months in close collaboration with partners including the International Renewable Energy Agency (IRENA) and Sustainable Energy for All (SEforALL).



Almost 2.5 billion people do not have access to climate-friendly cooling solutions, according to SEforALL. Over 1 billion people are at high risk from extreme heat due to a lack of cooling access – the vast majority living in Africa and Asia.

However, conventional cooling, such as air conditioning, is responsible for over seven per cent of global greenhouse gas emissions. If not managed properly, energy needs for space cooling will triple by 2050, together with associated emissions.

"Expanding cooling will protect the most vulnerable communities from extreme heat, keep food fresh and vaccines safe, employees productive and digital economies viable," said Inger Andersen, Executive Director at UNEP. As cooling expands, we need to prevent cooling-related greenhouse gas emissions from adding fuel to the climate fire. I am therefore pleased that cooling has been put on the global agenda of the next UN Climate Change Conference."

The initiative provides incentives to governments and non-state stakeholders to act on sustainable cooling in five areas: nature-based solutions, super-efficient appliances, food and vaccine cold chains, district cooling, and National Cooling Action Plans.

"The global rise in temperatures is a direct threat to the health and prosperity of billions of people. But addressing this challenge should not result in further damage. We must move away from cooling systems that are inefficient and polluting and provide equitable access to climate-friendly cooling solutions. COP28 UAE is committed to innovative technologies and partnerships that deliver results. We will work with the Cool Coalition and UNEP to elevate this issue and look forward to showcasing solutions at COP28 this year." said His Excellency Dr. Sultan Al Jaber, COP28 President-Designate.

In the run-up to COP28, which will take place from 30 November to 12 December at Expo City Dubai, the Cool COP Menu of Actions will enable governments, the private sector, development banks, financial institutions, and philanthropies to contribute to wider and fairer access to cooling services while paving the way for sustainable cooling solutions.

"Maldives has been able to complete the phase down of HCFC in 2020, 10 years ahead of the timeline set by Montreal Protocol. Yet, fragile countries like Maldives, are paying the high price of non-action on cooling: today, we are experiencing deadly loss and damage from extreme heat and broken cold chains," said Khadeeja Naseem, Minister of State for Environment, Climate Change and Technologies of Maldives, who is among the early



supporters of this initiative “It is of utmost importance that access to sustainable and efficient cooling systems be equitable Maldives encourage all countries, regardless of developed or developing economic status, to undertake ambitious action in their cooling sector.”

To galvanise support for sustainable cooling, Denmark has announced that their Minister for Development Cooperation and Global Climate Policy Dan Jørgensen will step in as a **Cool Champion**.

“Denmark decided to become a Cool Champion to promote global action on sustainable cooling and bring it to the 2.5 billion people in the global south who lack access,” said Dan Jørgensen , Minister for Development Cooperation and Global Climate Policy, Denmark .“Sustainable cooling is not only the blind spot of the energy transition but can also bring critical co-benefits including food security and health,” he added.

UNEP will publish a Cooling Stocktake report ahead of COP28. The report will assess implemented country actions on sustainable cooling, evaluate new opportunities and offer insights into political action that can reduce greenhouse gas emissions from the cooling sector.

“Today we have heard clearly from the COP 28 Presidency that sustainable cooling is on the agenda for 2023 – and so it should be. Access to cooling is an issue of equity for the over 1 billion people who face serious cooling access risks. Life doesn’t stop when temperatures go above 35 degrees. But when it does, equality of opportunity, productivity, and health is at stake for the most vulnerable. I hope you’ll join me this year in working hard to address this,” said Damilola Ogunbiyi, CEO and Special Representative of the UN Secretary-General for Sustainable Energy for All and Co-Chair of UN-Energy

The **Global Stocktake of the Paris Agreement** (GST) is a key process for COP28 to gauge the world’s collective progress towards the goals of the agreement and agree on a new pathway to 2030.

### **The UN Environment Programme (UNEP), 16 January 2023**

*Image: UNEP website / Pixabay*

#### **5. Hunga Tonga undersea volcano eruption likely to make ozone hole larger in coming years**

The huge amount of water injected by the cataclysmic Hunga Tonga volcanic eruption into Earth's atmosphere last year will temporarily affect the protective ozone layer.

The Hunga Tonga volcanic eruption that stunned the world last January



The Hunga Tonga-Hunga Ha'apai volcanic eruption in January 2022 injected a record-breaking amount of water into Earth's stratosphere. (Image credit: Maxar Technologies via Getty Images)

injected so much water into the stratosphere that it will likely make the ozone hole larger in the coming years, scientists believe.

According to reports, the powerful eruption, which was seen from space and detectable by all sorts of sensors around the globe, increased the amount of water in the stratosphere by 10%. The stratosphere is the second-lowest layer of Earth's atmosphere and is where the ozone layer, which protects the planet from harmful ultraviolet radiation, resides.

Now, that ozone may be at risk because the water emitted by the Hunga Tonga volcano has caused "significant cooling in the stratosphere in southern mid-latitudes," Paul Newman, the chief scientist for atmospheric science at NASA Goddard Space Flight Center, told Space.com.

Cooler temperatures in the stratosphere speed up the process of ozone degradation, Vincent Henri Peuch, the head of the European Copernicus Atmosphere Monitoring Service, told Space.com. That's because when the stratosphere is cooler and there is a lot of water present at those altitudes, scientists observe more frequent formation of polar stratospheric clouds, thin eerie clouds floating 9 to 15 miles (15 to 25 kilometers) above Earth. These clouds form during winter months when temperatures in the stratosphere are at their coldest and provide the right chemical environment for chlorine-based ozone depleting substances, which were banned in 1989 but still linger in the air high above the planet, to destroy ozone.

"During the polar night, there is preprocessing of the chlorinated compounds going on on the polar stratospheric clouds," Peuch said. "That works throughout the Antarctic winter in July and August, and when the light returns in the polar regions in September, all this preprocessing turns into the ozone destruction that we then see as the ozone hole."

Once the stratosphere warms up when the Antarctic summer arrives, the ozone hole starts closing and usually disappears by the end of November.

Although the Hunga Tonga eruption occurred in January, scientists didn't see an impact on this year's ozone hole. So scientists' eyes are on next year. Newman said that while it was speculative to forecast the effect of Hunga Tonga on next year's ozone hole above Antarctica, he was reasonably confident scientists will see the difference.

"The material from Hunga Tonga didn't get into the ozone hole over Antarctica this year, but will certainly get there this coming year," Newman said. "And just from a simple guesstimate, I would say that the effect will be detectable and that it will be fairly large. Of course, the Antarctic stratosphere varies year to year so there is always a chance that we'll have an odd stratospheric circulation this coming year and the effect of Hunga Tonga won't be evident, but I think it will be."

Scientists, however, are not worried about this temporary increase in the ozone hole's size. According to the latest assessment by the World Meteorological Organization (opens in new tab) (WMO), the Earth's protective ozone layer, located at altitudes between 9 and 21 miles (15 and 35 km), is recovering from the depletion caused by chemicals containing chlorine and bromine that had been used in aerosol sprays and refrigerants since the 1950s. Scientists first noticed the weakening of the ozone layer, as well as the gaping hole in it above Antarctica, in the 1970s, and quickly found the culprit. Through the weakened ozone layer, more damaging ultraviolet radiation was reaching Earth's surface. Studies

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estimate that in Australia, the continent most affected by the ozone layer degradation, the incidence of melanoma, a type of skin cancer associated with damage caused by ultraviolet light, rose by 60% between 1982 and 2010.

The use of the offending substances was banned by the Montreal Protocol, which the United Nations signed in 1987. According to the new assessment released Jan. 8, the ozone layer all over the world should mostly heal in the next two decades. It will take a bit longer for the Antarctic ozone hole to close completely, but scientists expect it to disappear by the mid-2060s.

Despite the Montreal Protocol's success in averting one of humankind's worst self-inflicted environmental disasters, satellite measurements show that the ozone hole over Antarctica can still reach substantial sizes and last long into the Antarctic summer. According to the European environment monitoring programme Copernicus, the ozone hole in the past three years was surprisingly large and remained open well into December when it usually closes by late November.

According to Peuch, this unusual behavior may be due to fluctuations in the size and strength of the polar vortex, the area of strong cold winds above Earth's poles. These changes, which might be a consequence of climate change, sometimes lead to cooler than usual conditions in the polar vortex, which then in turn leads to a larger and longer lasting ozone hole. Although the Antarctic ozone hole of 2023 may join its three large and long-lasting predecessors, perhaps with the help of the water vapor from Hunga Tonga, scientists are confident that in the longer term, we will see the ozone hole shrinking.

"We don't understand exactly what drives this year on year variability," said Peuch. "It's like the weather. One year, the stratosphere will be colder than the next year. You have hotter and colder periods, and with that you have different patterns of variability in the size of the ozone hole. It's still an area of research."

**[Space, January 2023, By Tereza Pultarova](#)**

*Image: Space website | The Hunga Tonga-Hunga Ha'apai volcanic eruption in January 2022 injected a record-breaking amount of water into Earth's stratosphere. (Image credit: Maxar Technologies via Getty Images)*

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## 6. Installing solar-powered refrigerators in developing countries is an effective way to reduce hunger and slow climate change

Food loss and waste are major problems around the world. When food is tossed aside or allowed to spoil, it makes economies less productive and leaves people hungry.



Road work in Kashmir in the fall of 2022 halted thousands of trucks carrying apples on the main highway connecting the disputed region with the rest of India, causing extensive losses. Faraz Bashir/SOPA Images/LightRocket via Getty Images

It also harms Earth's climate by generating methane, a potent greenhouse gas. Food loss and waste accounts for 4 percent of global greenhouse gas emissions. If food waste were a country, it would be the third-largest emitter in the world, ahead of India and behind only China and the U.S.

Worldwide, 1.3 billion tons of food are lost or wasted every year. Earth's population is projected to increase from 8 billion today to roughly 10 billion by 2050. Feeding that many people will require nations to increase agricultural production by more than 70 percent and reduce food loss and waste.

Expanding food cold chains to the world's least-developed countries can have enormous impacts. But it also raises concerns if it's not done in a way that avoids contributing to climate change.

### Why are 'cold chains' so important?

To understand why cold chains are so important, think about how food travels from the farm to your table. First it is harvested and shipped to a wholesaler. Then it might go straight to retail stores, or to a food processing company to be cooked, frozen or canned. At each stage it may sit for periods lasting hours to days. If it is not held at a safe temperature, the food may spoil or become contaminated with bacteria that cause foodborne illnesses.

In 2021, over 700 million people were hungry around the world – 425 million in Asia, 278 million in Africa and 57 million in the Caribbean and Latin America. Many countries in these regions have minimal cold storage capacity to keep food from spoiling before it can be eaten.

Seafood, meat, milk, and vegetables are highly reliant on cold food chains. Countries mainly in the developing world lose 23 percent of their perishable products before they reach markets.

Loss of cereal crops, which also benefit from cold storage, are equally staggering. For instance, Ethiopia loses about one-third of its stored corn after five weeks due to lack of proper storage. In 2019, India's Ministry of Food Processing Industries estimated that the country had lost or wasted 56 million tons of food, worth about US\$10 billion, mainly due to lack of cold storage.

Inadequate postharvest management can lead to crop contamination and pest infestation. In Uganda, where most corn is grown by small farmers who lack proper facilities to dry and

store it, contamination with fungi that produce dangerous substances called aflatoxin has been a significant human and animal health concern.

### **What are the social benefits of cold storage?**

Nearly 150 countries have adopted the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. This measure, negotiated in 2016, is driving changes in the cooling energy sector by requiring nations to phase down use of HFCs.

The global cold chain market is worth \$160 billion today and is projected to reach \$585 billion by 2026. Solar-powered cold storage is a niche market today but is poised for growth.

In addition to minimizing food loss and waste, increasing incomes, curbing land degradation and reducing greenhouse emissions, sustainable cold storage offers great benefits for women, who produce 60 to 80 percent of crops and are responsible for postharvest activities in most developing countries.

Research in climate finance shows that women may be disproportionately burdened by poverty because they have less access than men to assets and financial resources in many countries.

However, since women play key roles in farming and managing food supplies, they are positioned to participate in the food cold chain business in remote and rural areas if the international community provides financial and technical support, thus improving their economic status and livelihoods. [...]

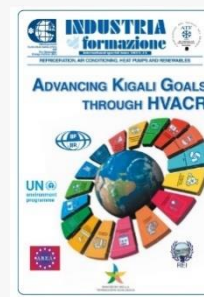
*Author: Abay Yimere, Postdoctoral Scholar in International Environment and Resource Policy, Tufts University.*

### **The Conversation, 19 January 2019**

*Image: The conversation website | Road work in Kashmir in the fall of 2022 halted thousands of trucks carrying apples on the main highway connecting the disputed region with the rest of India, causing extensive losses. Faisal Bashir/SOPA Images/LightRocket via Getty Images*

### **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.



The [International Special Issue 2022- 2023](#) was officially launched during a side event at the Thirty-Fourth Meeting of the Parties to the Montreal Protocol in Montreal, (MOP34), 31 October – 4 November 2022 | Montreal, Canada

**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 and 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

ASIA AND THE PACIFIC

## 7. UNEP and partners launch India Cold Chain Programme



Led by the UN Environment Programme under the framework of the Cool Coalition, the India Cold Chain Programme is being launched today with the Ministry of Agriculture and Farmers Welfare at the India Cold Chain Conclave – a one-day exhibition and conference focusing on “Innovation & Excellence in Cold Chain”.

Developed in consultation with the Ministry of Agriculture and Farmers Welfare and the National Centre for Cold Chain Development (NCCD) and in partnership with the Alliance for an Energy Efficient Economy (AEEE), Energy Efficiency Services Limited (EESL) and the Bureau of Energy Efficiency (BEE), the programme is set to help raise public awareness on the benefits of sustainable cold chains in India’s cooling sector and accelerate policymaking and implementation for more energy-efficient, sustainable cold chains in the country. The programme is supported by the Government of Denmark under the India-Denmark Green Strategic Partnership, the Clean Cooling Collaborative and Tabreed CSR.

Mr Atul Bagai, Head of UNEP India, points out that we cannot address the triple planetary crises of climate change, biodiversity loss and pollution without confronting food loss and food insecurity, rising energy and refrigerant emissions and inequality. [...]

The India Cold Chain Programme builds on wider efforts by UNEP and Cool Coalition partners to improve cold chains at global scale. Together with the Food and Agriculture Organization, UNEP has launched in 2022 the report “Sustainable Food Cold Chains: Opportunities, Challenges and the Way Forward” – a document that explores how food cold chain development can become more sustainable and makes a series of important recommendations, such as adopting a systems approach, establishing minimum efficiency standards and supporting National Cooling Action Plans with financing and ambitious targets. [Learn more about the report](#)

**The Cool Coalition, 19 January 2023**

*Image: The Cool Coalition Website*

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## 8. Asia Pacific exploring innovative strategy to garner general public advocacy on Ozone2Climate action

27 January 2023, Virtual – National Ozone Officers (NOOs) of **South Asia (SA), Southeast Asia (SEA) and Pacific Island Countries (PICs) Networks** jointly discussed the 2023 Communications and Public Outreach Strategy through the two virtual consultation meetings on 18 and 26 January 2023. A total of 63 participants (39 females and 24 males) engaged in the virtual meetings.



Participants were introduced to new concepts regarding a full cycle of strategic communications, outreach development, and implementation. Significant components that were elaborated and discussed included: positioning, goal and objectives setting, audience segmentation, message framing, material production, dissemination, amplification, and monitoring and evaluation. The discussion on each component was productively participated by NOOs where country-specific context was reflected and incorporated into the regional strategy development.

**“Building on the success from having conducted the Asia & Pacific Ozone2Climate Artwork Contest, we need to continue our efforts to raise regional public awareness and visibility of the Montreal Protocol especially the Kigali Amendment through innovative and impactful ways to ensure that the general public are well informed and take meaningful actions to help restore the ozone layer and mitigate climate change,”** said Mr. Shaofeng Hu, Senior Montreal Protocol Regional Coordinator, UNEP OzonAction Regional Office for Asia-Pacific.

The public will be targeted and engaged on various platforms, including mass media, social media, as well as public events and activities. NOOs also exchanged ideas on the key messages and material production that will suit their needs of public interests. Youths were also identified as one of the main key target groups to be effectively advocated via social media influencers.

Moving forward, NOOs will finalize the 2023 Communications and Public Outreach Strategy and further discuss its implementation. Regular communications-related meetings will also be conducted throughout the year to ensure smooth and effective implementation, identify needs, and address any challenges that emerge.

Prior to the meeting, the NOOs were asked to share their previous achievements, foreseen challenges, and initiatives for 2023. This process enabled the Asia-Pacific Compliance Assistance Programme (CAP) team to conduct a communications-focused situational analysis as a basis for formulation of the regional strategy.



The meetings were organized by UNEP OzonAction in Asia-Pacific as one of its activities for 2023 and under the mandate of the Multilateral Fund for the Implementation of the Montreal Protocol.

**Contact:**

**Shaofeng Hu**, Senior Montreal Protocol Regional Coordinator UNEP,  
**OzonAction** Compliance Assistance Programme (CAP), Asia and Pacific Office

*Image: OzonAction*

### **9. Indonesia to apply Kigali Amendment from March**

Jakarta (ANTARA) - Indonesia has affirmed its commitment to implementing the Kigali Amendment, which prescribes a reduction in the use and production of hydrofluorocarbons (HFCs), from March 14, 2023, to help tackle climate change.



Director general of climate change mitigation at the Environment and Forestry Ministry, Laksmi Dwanthi, talks about the ratification of the Kigali Amendment in Jakarta on Wednesday (January 25, 2023). (ANTARA/Sugiharto Purnama/uyu)

Director general of climate change mitigation at the Environment and Forestry Ministry (KLHK), Laksmi Dwanthi, said that controlling the use of HFCs by enforcing the Kigali Amendment could help prevent an increase in the Earth's temperature by 0.4 degrees by 2100 and protect the ozone layer.

She made the statement while disseminating information on the ratification of the Kigali Amendment here on Wednesday.

Indonesia ratified the Kigali Amendment on December 14, 2022, through Presidential Regulation Number 129 of 2022 concerning the ratification of the amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Kigali, 2016.

The director general said she expects that the policy to control the use of HFCs will help reduce the potential for global warming.

"By controlling the HFCs, Indonesia can increase its targets for reducing greenhouse gas emissions, especially (since the new target will be conveyed) in the Second NDC (Nationally Determined Contributions) document, which is being prepared," she expounded.

Indonesia will also get many opportunities to develop eco-friendly cooling technologies as well as other technologies, which will bolster the government's efforts to carry out environmentally friendly development through the enforcement of the Kigali Amendment, she said.

According to the government's HFC reduction road map, Indonesia will start restoring HFC consumption in the country and bring it to the baseline level, which is estimated at 18.85 million tons of carbon dioxide equivalent, by 2024.

Then, further reductions will be carried out in stages. The use of HFC is targeted to decline by 10 percent from the baseline in 2029, 30 percent in 2035, 50 percent in 2040, and 80 percent in 2045.

Still, for meeting the reduction target, KLHK and all stakeholders will further calculate the consumption reduction scenario by taking national interests and priorities into account.

"Cooperation and collaboration from all stakeholders are crucial to achieve the target of reducing (global) HFC consumption, which has been set for up to 2100," Dwanthi added.

**ANTARA Indonesia News Agency, 26 January 2023, By: Sugiharto Purnama, Uyu Liman**

*Image: ANTARA Website*

## 10. Global warming from human cooling

**Mobile air conditioning is a non-negligible source of climate change, but by using natural refrigerants, direct emissions can be reduced by 99 percent.**

China has been one of the world's leading vehicle markets for years now, with the number of vehicles on its roads reaching more than 408 million in August 2022. China is proactively curbing tailpipe emissions from vehicles and has progressively increased the stringency of emissions limits in recent decades. There is also a big push to transition to battery electric vehicles. However, the mobile air conditioning (MAC) systems in vehicles have not yet been subject to much public or regulatory attention and they should be, because they have the potential to exacerbate global warming throughout their life cycle.



Indeed, the International Energy Agency estimated that greenhouse gas emissions from MAC systems globally were around 420 million metric tonnes of carbon dioxide equivalent in 2015. That was about 1 percent of global energy-related CO<sub>2</sub> emissions that year. However, if not improved, MAC systems will become a larger share of the climate impacts of vehicles in the years ahead, as we decarbonize the fuels they run on and other components.

As of 2020, almost every passenger car and bus in China, and more than 90 percent of trucks, were equipped with MAC systems. In recent decades, hydrofluorocarbon (HFC) refrigerants have been widely applied in vehicles because they offer good performance in terms of heat exchange and come at an affordable cost. However, pressure is mounting to move away from HFC refrigerants because their global warming potentials are higher than

1,000, meaning that they are more than 1,000 times more powerful than CO<sub>2</sub> in their climate warming impacts.

The impacts come in two forms. Refrigerants leak into the atmosphere during assembly, vehicle maintenance, operation, and scrapping and recycling. Leakage of refrigerants is also referred to as direct emissions, and the IEA estimated that these account for about 30 percent of total GHG emissions from MAC systems. The remaining 70 percent are indirect emissions that come from the increased energy consumed to run MAC systems. While several studies have found that MAC systems account for 3 percent to 7 percent of total fuel consumption in passenger cars, that can go up to 20 percent in humid and hot climates. For heavier vehicles, the impact is even more severe. A report from the International Council on Clean Transportation found that in buses, about 30 percent of total energy is consumed by their MAC systems.

As China does not test the energy consumption of MAC systems to inform customers about how they perform in different circumstances, drivers' lack of awareness of MAC energy consumption can also make MAC systems more energy-intensive in daily operations.

International efforts to phase down the use of harmful refrigerants go back to the 1980s and the Montreal Protocol. HFCs were once the preferred replacement for more hazardous and harmful compounds, which not only had an extremely high global warming potential, but also threatened the planet's ozone layer. However, the Kigali Amendment to the Montreal Protocol, which became effective in 2019, calls for gradual reduction in production and consumption of HFCs. The European Union is leading the way and has banned refrigerants with global warming potential greater than 150 for all vehicles since 2017.

The United States will ban the use of HFCs for transport beginning in 2025 and Canada banned refrigerants with a global warming potential higher than 150 in 2019. China ratified the Kigali Amendment in 2021 and the mandate will begin in 2024.

However, China is facing challenges. There exists an advanced refrigerant for MAC systems offering great cooling performance with global warming potential less than 1, which implies it's less damaging to the climate than CO<sub>2</sub>. However, in China the refrigerant is still under the patent umbrella of international chemical giants. Chinese suppliers have to pay high premiums and that hinders its large-scale application in new vehicles. Second, natural refrigerants such as CO<sub>2</sub> come with extra costs to renovate the MAC systems currently in use. Third, China has not yet issued a specific road map requiring the automobile industry to phase down HFC refrigerants and automakers thus show little willingness to make the transition. International experience shows that the substitution of refrigerants is mostly driven by policy, and we can expect fewer replacements of the prevailing refrigerants in the absence of government ambition to push the whole industry forward with direct guidance.

It's important to overcome any challenges because the potential benefits of GHG reduction from MAC systems are substantial. A recent study by the ICCT found that improving MAC systems by adopting natural refrigerants would reduce direct emissions by 99 percent. Combining both direct and indirect emissions, the study found that cities with cool and warm climates can expect 60 percent and 45 percent less GHG emissions, respectively, from CO<sub>2</sub>-based MAC systems. Given that electric vehicles are increasingly popular, with millions of new vehicles sold in China each year, the potential benefits of decarbonizing MAC systems can also be leveraged. Electric vehicles are considered more energy efficient

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than conventional internal combustion engine vehicles because they only lose about 15 percent to 20 percent of the energy they get from the grid when powering the vehicle; in contrast, conventional gasoline vehicles generally see a 70 percent loss from fuel to wheels. By applying a series of technologies that improve energy efficiency, MAC systems in electric vehicles can save more energy and therefore show greater GHG reduction benefits.

On the way to China's goal of carbon neutrality, any effort to reduce the global warming effects of MAC systems is valuable. Improvements in MAC systems should be included in the country's decarbonization efforts when policymakers are considering how to turn the transport sector greener.

[China Daily Global, 16 January 2023, By Mao AO Shiyue](#)

*Image: China Daily Global Website*

## 11. Australia Day 2023 Honours List

The Australia Day 2023 Honours List recognises and celebrates recipients, including in the General Division of the Order of Australia and awards for meritorious, distinguished, and conspicuous service.

Among the Awardees:

**Dr Helen Tope** received an Office of the Order of Australia (AO) for her distinguished service to environmental protection, particularly of the ozone layer, through leadership, research, and policy development. Helen has worked on aerosols for many years, particularly MDIs, and played a pivotal role on the Montreal Protocol's TEAP.

[View the Australia Day 2023 Honours List](#)

[The Governor-General of the Commonwealth of Australia, January 2023](#)

*Image: The Governor-General of the Commonwealth of Australia Website*



**NORTH AMERICA**

## 12. The Heat: Climate Change – Ozone Layer

Earth's protective layer is healing. What's behind the change and what does it mean for the environment?

There's good news to report about the environment. The Earth's ozone is set to fully recover within the next four decades. A new United Nations report indicates efforts to reduce chemicals that eat into that protective layer of Earth's atmosphere are paying off.



Joining the discussion:

- **David Fahey** is Director of the U.S. National Oceanic and Atmospheric Administration and Co-Chair of the Montreal Protocol's Scientific Assessment Panel.
- **Yixing Xu** focuses on clean energy technology and energy policy as research director for Breakthrough Energy Sciences.
- **Michael K. Dorsey** is director of Arizona State University's Sustainability Solutions Service, and a chair professor at ASU's College of Global Futures.
- **Sweta Chakraborty** is CEO of "We Don't Have Time U.S."

**CGTN TV, 25 January 2023, By Sean Callebs**

*Image: CGTN TV website*

**EUROPE AND CENTRAL ASIA**

### 13. Opinion on the proposal for a regulation of the European Parliament and of the Council on fluorinated greenhouse gases

**Opinion** of the Committee on Industry, Research and Energy for the Committee on the Environment, Public Health and Food Safety on the proposal for a regulation of the European Parliament and of the Council on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014 (COM(2022)0150 – C9-0142/2022 – 2022/0099(COD)) Rapporteur for opinion: Sara Skytvedal

#### Short Justification

The Rapporteur supports many elements in the Commission proposal, especially regarding the enhanced implementation and enforcement on matters of illegal trade, the training needs on F-gas alternatives, the monitoring and reporting to fill existing gaps and improve processes and data quality for compliance and clarity, as well as internal coherence to support better implementation and understanding of the rules.

Training and certification for sustainable alternatives is important. The Rapporteur believes that the F-gas Regulation is a key instrument with respect to emissions of fluorinated greenhouse gases (F-gases) and that the 2014 F-Gas Regulation has proven to be successful. The Rapporteur also believes that more should be done to prevent additional F-gas emissions, thereby contributing to EU climate objectives, and that compliance with the Montreal Protocol as regards obligations related to hydrofluorocarbons ('HFCs') should be ensured.

However, the Rapporteur is of the opinion that certain provisions of the Commission's proposal could potentially jeopardize the clean energy transformation in heating and cooling and the achievement of EU energy independence, creating an additional burden to the European industry as well as to European consumers who wish to switch towards sustainable and efficient heating and cooling solutions. Therefore, the Rapporteur proposes amendments to ensure the availability of a full and diverse range of refrigerants for heating and cooling installations, in line with the Repower EU's ambition to frontload the deployment of heat pumps by 2030, as well as the Energy Efficiency Directive and the Energy Performance of Buildings Directive.

The Rapporteur also proposes to extend the ban date for 12 to 24 kV (12 kV excluded) voltage level switchgear from 2026 to 2028, as there are concerns that manufacturers will not be able to supply enough SF6-free switchgear by 2026 on this specific voltage level.





Furthermore, the Rapporteur wants to achieve a better balance between phasing down F-gases and considerations of patient health.

F-gases are widely used as propellants in metered dose inhaler (MDIs). The Rapporteur therefore reinstates the long-standing exemption for MDIs under the F-Gas regulation, which is deleted in the Commission proposal. [...]

### The European Parliament, 24 January 2023

Image: European Parliament website

#### 14. Heat Pumps on Natural Refrigerants in the Context of the F-Gas Regulation

The **TRI-HP project** is organising a Final event in cooperation with **BUILD UP Portal**

**Where:** Brussels, L42 Building Rue de la Loi 42 1000 Brussels, Belgium

**When:** February 7<sup>th</sup>, 2023

**How to register:** [click here](#)



**Hybrid Event:**  
Heat pumps on natural refrigerants in the context of the F-Gas Regulation

**07 February 2023**  
14:00 - 18:00  
L42, Rue de la Loi 42, Brussels

**TRI-HP PROJECT** | Trigeration systems based on heat pumps with natural refrigerants and multiple renewable sources

The Commission's proposal for a revision of the **F-Gas Regulation**, published in April 2022, intends to phase-down fluorinated gas (F-Gas) emissions by 98% until 2050. F-gases, such as hydrofluorocarbons (HFCs), are the most commonly used refrigerants in heat pumps. The phase-down has sparked discussions throughout the RACHP industry as it could become an additional barrier to the market uptake of heat pumps. Others argue that HFCs used in heat pumps can leak into the atmosphere and they are highly potent greenhouse gases with a very high Global Warming Potential (GWP), up to a thousand times stronger than CO<sup>2</sup>. Alternative solutions are available on the market already today, being heat pumps based on natural refrigerants such as propane or CO<sup>2</sup>.

The TRI-HP project worked on innovative heating & cool systems with a high share of renewables and based on heat pumps using natural refrigerants. In Q1 of 2023 the European Parliament and Council will start the inter-institutional negotiations on the F-Gas Regulation which is why for its final event TRI-HP wants to bring together researchers, industry stakeholders and policymakers to further discuss the potential and evolutions of heat pumps based on natural refrigerants and if the market is ready for the phase-down(/out) of HFCs by 2050.

The event is divided into two parts: In the first session we will hear from research experts and industry stakeholders what heat pumps based on natural refrigerants are, the application of different refrigerants such as propane or CO<sup>2</sup>, their market readiness and social barriers of heat pumps in general.

The second session will focus on the F-Gas Regulation Revision, the ongoing negotiations and what the opportunities and risks are with a phase-down(out) of HFCs & HFOs. The session will end with a panel discussion that brings together policy, industry & research experts that represent different sides for an open debate.

[Register here](#)

*TRI-HP: Trigenation systems based on heat pumps with natural refrigerants and multiple renewable sources.*

**TRI-HP, 12 January 2023**

*Image: TRI-HP website*

**15. Cool Up supports sustainable cooling solutions demonstration. The call for ideas is now open!**

**Pioneering projects in sustainable cooling**



**Invitation to submit your ideas for the Cool Up demonstration projects, showcasing the successful application of sustainable cooling in our partner countries: Egypt, Jordan, Lebanon, and Türkiye.**

Following the submission of an idea, applications will be shortlisted. A Cool Up expert will then follow up with applicants to gather additional information about their projects before making a final decision. Selected projects will benefit from technical, funding, and/or marketing support.

Cooling is a major consumer of energy in the Middle East and North Africa (MENA) region. With the Cool Up demonstration projects, we want to illustrate that sustainable cooling in the MENA region is possible, feasible, and safe. The Cool Up demonstration projects will exemplify what is achievable with sustainable cooling in the region.

**Sustainable cooling** is affordable and safe cooling that meets users' needs while having minimal impact on the environment. Specifically, sustainable cooling does not use environmentally harmful refrigerants such as fluorinated gases (F-gases), it has low energy demand through high efficiency, and it is compatible with a fully renewable energy supply.

**Deadline for submission of ideas: 28 February 2023**

**Eligible project countries: Egypt, Jordan, Lebanon, Türkiye**

**Eligible applicants:** Anyone can submit project ideas for the competition, however, Cool Up is particularly interested in working with:

- Building owners or investors (private or public)
  - Retail and hospitality i.e., supermarkets, hotels, restaurants, etc.
  - Municipalities
-

- Architects, technical advisors, and engineers
- Local equipment manufacturers that are converting to natural refrigerants

**Eligible cooling technologies:** Technologies that use natural refrigerants or no refrigerants for commercial air conditioning, residential air conditioning, and commercial refrigeration.

**Project duration:** ~2 years (including monitoring and evaluation)

**Demonstration projects benefits:** The demonstration projects will serve as role models for an accelerated and broad uptake of sustainable cooling in the MENA region and Türkiye. Successful applicants will be eligible to receive a range of support from Cool Up.

Learn [more >>>](#)

[Cool Up, January 2023](#) *Image: Cool Up website*

## FEATURED



**Summary of the 34<sup>th</sup> 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 in 2022-2023** - Click [here](#) for upcoming and past Montreal Protocol Meetings dates and venues.

### 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

*Image: UNEP, Ozone Secretariat website*

### 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](#)**

*Image: 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:

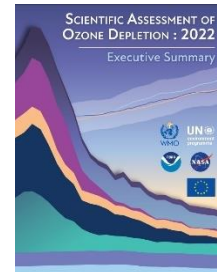
- [The Technology and Economic Assessment Panel](#)
- [The Scientific Assessment Panel](#)
- [The Environmental Effects Assessment Panel](#)

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, November 2022](#)



### **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.

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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:**

- [UPDATED guide for the submission of institutional strengthening projects](#), 1/27/2023
- [UPDATED institutional strengthening request format now available in EN/FR/SP](#).  
1/20/2023

The 92<sup>nd</sup> meeting is scheduled for 29 May to 2 June 2023, in Montreal, Canada  
The 93<sup>rd</sup> 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. \*

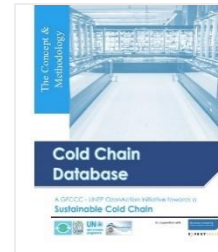
### **Using the Gas Card web-based tool**

- 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)*

## OzonAction and GFCCC launch the methodology questionnaires the Cold Chain Database Initiative

The Global Food Cold Chain Council (GFCCC) and the United Nations Environment Programme (UNEP) OzonAction announced the launch of their Cold Chain Database and Modeling initiative. The initiative marks the first formal step to assist developing countries in identifying their cold chain baseline along with consumption of relevant HCFCs or HFCs or other refrigerants. The initiative was conceived in 2019 and kicked off during the 31<sup>st</sup> Meeting of Parties to the Montreal Protocol (Rome, Italy), which concluded with the Rome Declaration on “The Contribution of the Montreal Protocol to Food Loss Reduction through Sustainable Cold Chain Development”.



> [GFCCC-UNEP OzonAction Cold Chain Modelling Press Release](#)

> [GFCCC-UNEP Cold Chain Database Methodology Final](#)

> For countries or partners interested to use the model data collection detailed questionnaires, please fill in the [Expression of Interest and NDA of Cold Chain Database](#) form and return to UNEP, OzonAction

The image is a screenshot of a desktop application interface. It features a header with a search bar and a "Add New Licences" button. Below the header is a table with columns for "Licence ID", "Quantity HPMP Allowed", "Quantity Quota Allowed", "Company", "Year", and "Action". The table contains several rows of data, with some cells highlighted in red. The interface is clean and professional, with a light blue and white color scheme.

## 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 CO<sub>2</sub>-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, CO<sub>2</sub>-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 it all the official facts and figures in one place. Conversion formulas need to be applied to calculate CO<sub>2</sub>-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](#)

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### 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](mailto: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](#).

**Refrigerant Cylinder Colours: What has Changed** - A new UNEP OzonAction factsheet on the new AHRI revised guideline on a major change to refrigerant cylinder colours - One of the ways in which refrigeration cylinders are quickly identified is by cylinder colour. Although there was never a truly globally-adopted international standard, the guideline from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) although not required by law was used by the vast majority of industry and chemical producers around the world. An AHRI revised guideline, first published in 2015, now removes paint colour assignments for refrigerant containers and specifies that all refrigerant containers should have the same paint colour from 2020 onwards. NOOs and technicians should be aware of this change and inform national stakeholders, as well as familiarising themselves with relevant container labels and markings for refrigerants. **Read/download the factsheet**



**Update on new refrigerants designations and safety classifications** - The latest version of the factsheet providing up to date information on refrigerant designations and safety classifications is now available (September 2020 update). The factsheet, produced by **ASHRAE** in cooperation with **UN Environment Programme OzonAction** is updated every 6 months. **Read/download the factsheet**



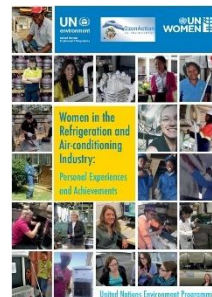
Contact: [OzonAction](#), UN Environment Programme



**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**

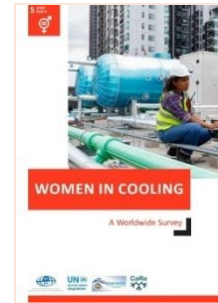


## PUBLICATIONS



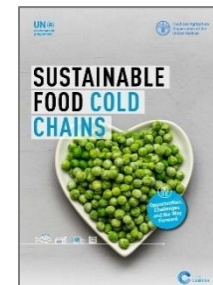
### [Results of a Worldwide Survey about Women in Cooling Released by IIR and UNEP OzonAction](#)

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. 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](#)



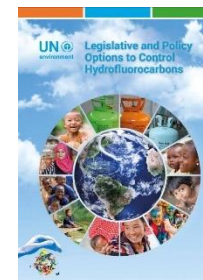
### [Sustainable Food Cold Chains: Opportunities, Challenges and the Way Forward](#)

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.

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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](#)**



**Cut Super Climate Pollutants Now!** The Ozone Treaty's Urgent Lessons for Speeding Up Climate Action (Resetting Our Future). We have a decade or less to radically slow global warming before we risk hitting irreversible tipping points that will lock in catastrophic climate change. The good news is that we know how to slow global warming enough to avert disaster. Cut Super Climate Pollutants Now! explains how a 10-year sprint to cut short-lived "super climate pollutants" – primarily HFC refrigerants, black carbon (soot), and methane – can cut the rate of global warming in half, so we can stay in the race to net zero climate emissions by 2050

*Authors: Alan Miller, Durwood Zaelke, Stephen O. Andersen.*



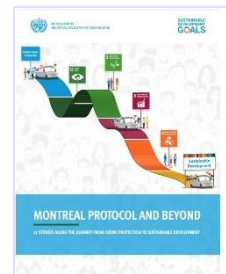
E-Book on Process Safety Management (PSM) Training for Ammonia Refrigeration - a new e-book about the critical elements of a process safety management (PSM) training program for facilities operating an ammonia refrigeration system. The e-book, titled "**7 Keys to a Compliant PSM Training Program for 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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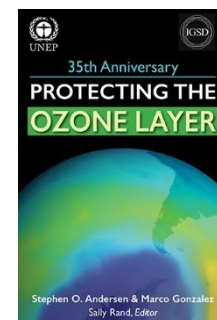


**Montreal Protocol and beyond: 17 stories along the journey from ozone layer protection to sustainable development** - The 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs) embody the global commitment to build a more sustainable future for all. These universally agreed objectives address the most urgent environmental, social and economic challenges of our time. [Read/Download here](#)



**Protecting the Ozone Layer - 35<sup>th</sup> Anniversary Edition** - a new book celebrating the 35<sup>th</sup> Anniversary of the Montreal Protocol.

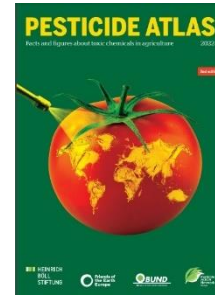
The electronic version (Kindle Edition) of the book has become **available for purchase \$3.03 on Amazon**.



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 (N<sub>2</sub>O), feedstock exemptions for plastics production, and dumping of obsolete cooling appliances.

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

The **PESTICIDE ATLAS 2022** is jointly published by Heinrich-Böll-Stiftung, Berlin, Germany Friends of the Earth Europe, Brussels, Belgium Bund für Umwelt und Naturschutz, Berlin, Germany PAN Europe, Brussels, Belgium Chief executive editors: Lisa Tostado, Heinrich-Böll-Stiftung European Union (project management) Dr. Silke Bollmohr, EcoTrac Consulting Managing editor, graphics research: Martin Eimermacher Art direction, graphic development: STOCKMAR+WALTER Kommunikationsdesign English editor: Caspar Shaller Proof reader: Pia Hartmer, Judith Höppner; Joan Lanfranco, Heinrich-Böll-Stiftung European Union Contributors: Johanna Bär, Ulricke Bickel, Silke Bollmohr, Larissa Mies Bombardi, Clara Bourgin, Wolfgang Bödeker, Carsten Brühl, Helmut Butscher-Schaden, Henrike von der Decken, Dave Goulson, Susan Haffmans, Johannes Heimrath, Carla Hoinkes, Heike Holdinghausen, Dominic Lemken, Layla Liebetrau, Martha Mertens, Moritz Nabel, Andre Prescher, Ilang-Ilang Quijano, Anna Satzger, Achim Spiller, Lisa Tostado, Katrin Wenz, Johann Zaller, Anke Zühlsdorf. [Read/Download](#)



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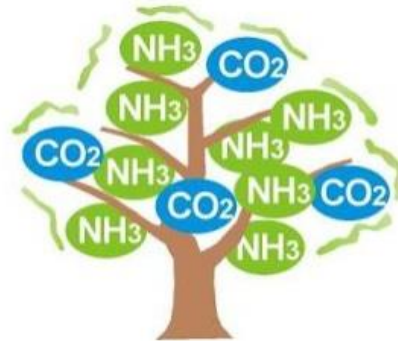
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## I am in the Montreal Protocol Who's Who... Why Aren't You?



The United Nations Environment Programme, OzonAction, in collaboration with Marco Gonzalez and Stephen O. Andersen are updating and expanding the "[Montreal Protocol Who's Who](#)".

We invite you to submit your nomination\*, and/or nominate Ozone Layer Champion(s). ***The short profile should reflect the nominee's valuable work related to the Montreal Protocol and ozone layer protection.*** Please notify and nominate worthy candidates through the [on-line form](#).

We look forward to receiving your nomination(s), and please feel free to contact our team for any further assistance concerning your nomination.

**Take this opportunity to raise the profile of women and men who made an important contribution to the Montreal Protocol success and ozone layer protection.**

- View the «Montreal Protocol Who's Who» [Introductory video](#)
- Contact : [Samira Korban-de Gobert](#), UN Environment Programme, OzonAction

*\* If you are already nominated, no need to resubmit your profile*



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Prepared by: Samira Korban-de Gobert

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