

# OzoNews

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

**Volume XXII | 15 March 2022**

## In this issue:

1. Kigali Amendment latest ratifications
2. Cutting HFCs to cool the Earth
3. On the stratospheric chemistry of midlatitude wildfire smoke
4. Two additional regions of Asia were sources of banned ozone-depleting chemicals
5. Ozone Layer Depletion and Emerging Public Health Concerns - An Update on Epidemiological Perspective of the Ambivalent Effects of Ultraviolet Radiation Exposure
6. Ozone Community Recognized as Critical to Making 'Great Things Happen'
7. Kenyan women in the RAC sector say 'yes' to Green Cooling
8. Sustainable cooling experts gather in Washington for global food loss summit
9. Cool Roofs Indonesia wins Million Cool Roofs Challenge
10. Vanuatu ODS Permit write-off implemented
11. Vietnam Outlines Progress on COP26 Commitments
12. Oman National Committee for Climate Change and the Protection of Ozone Layer put stress on the country's policy priorities
13. US Feds Sentence Refrigerant Smuggler to Probation, Must Pay \$250,000 Fine
14. UNIDO to offer expertise for Turkmen energy sector
15. La Guardia Civil desmantela en el País Vasco una organización dedicada al traslado ilícito de chatarra electrónica a países de la costa africana

## GLOBAL

### 1. Kigali Amendment latest ratifications

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

[Spain, Provisional application under Article V, 20 January 2022](#)

[Turkey, 10 November 2021](#)

[St. Lucia, 2 November 2021](#)



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. Cutting HFCs to cool the Earth

To have a better chance of holding global warming to 1.5°C, we need to accelerate the phase-down of HFC refrigerants under the Montreal Protocol. This could also reduce pollution and improve energy access.



An air conditioner may freshen the atmosphere in your home, but in doing so, it is probably degrading the atmosphere of Earth. Along with other cooling technologies such as refrigerators and heat pumps, today's aircon commonly relies on chemicals called HFCs (hydrofluorocarbons), which are very powerful greenhouse gases. HFCs have been used to replace ozone-depleting substances, and their emissions have increased rapidly in the past two decades.

To meet the Paris climate goals, the world now needs to wean itself off HFCs quickly, according to a new study led by IASA researchers published in the journal *Nature Climate Change*. As a bonus, this process could reduce global power consumption substantially, bringing many benefits such as lower pollution.

HFCs can be replaced with various gases that have a far lower climate impact per kilogram, including ammonia, CO<sub>2</sub>, and hydrocarbons such as propane. Indeed, a phase-down of HFCs is already required by international law. In 2016, these chemicals were brought into the Montreal Protocol, a treaty originally set up to curb ozone-depleting substances. The protocol's 2016 Kigali Amendment lays out HFC cuts for four groups of countries up to 2047, requiring consumption to fall by 80 to 85% relative to their respective baselines. The problem is that HFC emissions lag years behind consumption. They can leak out of cooling devices during manufacture and use, and when equipment is scrapped.

The new study considers this lag and examines how various HFC consumption scenarios would affect future emissions, using the IASA Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model. The study projects that, if left uncontrolled, HFC emissions from 2019 to 2050 would have amounted to more than 92 billion tons CO<sub>2</sub> equivalent. (Note that cumulative emissions until 2050 determines the effectiveness of HFC reduction for climate mitigation). Controlled by the Kigali Amendment, the total should be about 32 billion tons. That is however still far above the roughly 16 billion tons in SSP1-1.9 consistent climate scenarios, in which global warming is limited to around 1.5°C above pre-industrial temperatures.

"Current ambitions for HFC emissions reductions are not sufficient to meet the Paris Agreement's 1.5°C goal. A more ambitious target under the Kigali Amendment could still help achieve the Paris goal if countries act early," says Pallav Purohit, lead author on the

study and a senior researcher in the Pollution Management Research Group of the IIASA Energy, Climate, and Environment Program.

The Montreal protocol has a history of ratcheting up ambition, so the authors looked at various options for stronger HFC cuts. For example, in the existing Kigali Amendment, one group of developing nations is allowed to delay cuts by a few years because they have especially high ambient temperatures – so what if they were required to keep the same pace as other developing nations?

This turns out to make little difference to total emissions. Or, what if all nations had to reach 95% emissions cuts by 2050, instead of 80 to 85% in 2047? Again, this barely reduces cumulative emissions to 2050, but it leaves emissions at a lower level for the rest of the century, which is more in line with 1.5°C scenarios.

The most effective option involves all countries not only hitting 95% by 2050 but making accelerated deep cuts before that (for example, developed countries reaching 55% cuts in 2025, instead of the 35 to 40% required in the Kigali Amendment, and developing countries reaching 35% cuts in 2030, compared with 0 to 10% in the Amendment). This leads to 2050 cumulative emissions of less than 24 billion tons CO<sub>2</sub> equivalent – much closer to the 1.5°C climate scenario.

Better still, this early move would be an opportunity to replace old cooling equipment with more efficient hardware. This could save up to 20% of expected future global electricity consumption, which would double the climate benefits of the HFC phase-down, reduce air pollution, improve energy access, and cut consumer energy bills.

“Drawing on the Montreal Protocol’s start-and-strengthen approach, accelerated HFC phase-down would increase the chances of staying below 1.5°C,” Purohit concludes.

[International Institute for Applied Systems Analysis \(IIASA\), 10 March 2022, By Pallav Purohit, Ansa Heyl](#)

Image: IIASA website | © Ivan Jesus Cruz Civieta

See also >>> [Achieving Paris climate goals calls for increasing ambition of the Kigali Amendment](#), Nature Climate Change, 10 March 2022

### 3. On the stratospheric chemistry of midlatitude wildfire smoke

#### Significance

Large wildfires have been observed to inject smoke into the stratosphere, raising questions about their potential to affect the stratospheric ozone layer that protects life on Earth from biologically damaging ultraviolet radiation. Multiple observations of aerosol and NO<sub>2</sub> concentrations from three independent satellite instruments are used here together with model calculations to identify decreases in stratospheric NO<sub>2</sub> concentrations following major Australian 2019 through 2020 wildfires.

**On the stratospheric chemistry of midlatitude wildfire smoke**

Susan Solomon<sup>1,2</sup>, Kishore Dada<sup>3</sup>, Kate Sherwin<sup>4</sup>, Prashant Tiwari<sup>5</sup>, Uday Khattar<sup>6</sup>, Dawn S. Tarr<sup>7</sup>, Susan C. Solomon<sup>8</sup>, Karen G. Thompson<sup>9</sup>, Robert Portmann<sup>10</sup>, Sean Joseph<sup>11</sup>, William Randel<sup>12</sup>, Steve Solomon<sup>13</sup>, Chris Boone<sup>14</sup>, Charles G. Harwood<sup>15</sup>, Adam Bruesel<sup>16</sup>, David Loomis<sup>17</sup>, and Tracy Ingersoll<sup>18</sup>

**Abstract** Large wildfires have been observed to inject smoke into the stratosphere, raising questions about their potential to affect the stratospheric ozone layer that protects life on Earth from biologically damaging ultraviolet radiation. Multiple observations of aerosol and NO<sub>2</sub> concentrations from three independent satellite instruments are used here together with model calculations to identify decreases in stratospheric NO<sub>2</sub> concentrations following major Australian 2019 through 2020 wildfires.

**Introduction** Large wildfires have been observed to inject smoke into the stratosphere, raising questions about their potential to affect the stratospheric ozone layer that protects life on Earth from biologically damaging ultraviolet radiation. Multiple observations of aerosol and NO<sub>2</sub> concentrations from three independent satellite instruments are used here together with model calculations to identify decreases in stratospheric NO<sub>2</sub> concentrations following major Australian 2019 through 2020 wildfires.

The data confirm that important chemistry did occur on the smoke particle surfaces. The observed behavior in  $\text{NO}_2$  with increasing particle concentrations is a marker for surface chemistry that contributes to midlatitude ozone depletion. The results indicate that increasing wildfire activity in a warming world may slow the recovery of the ozone layer.

### **Abstract**

Massive Australian wildfires lofted smoke directly into the stratosphere in the austral summer of 2019/20. The smoke led to increases in optical extinction throughout the midlatitudes of the southern hemisphere that rivalled substantial volcanic perturbations. Previous studies have assumed that the smoke became coated with sulfuric acid and water and would deplete the ozone layer through heterogeneous chemistry on those surfaces, as is routinely observed following volcanic enhancements of the stratospheric sulfate layer. Here, observations of extinction and reactive nitrogen species from multiple independent satellites that sampled the smoke region are compared to one another and to model calculations.

The data display a strong decrease in reactive nitrogen concentrations with increased aerosol extinction in the stratosphere, which is a known fingerprint for key heterogeneous chemistry on sulfate/ $\text{H}_2\text{O}$  particles (specifically the hydrolysis of  $\text{N}_2\text{O}_5$  to form  $\text{HNO}_3$ ). This chemical shift affects not only reactive nitrogen but also chlorine and reactive hydrogen species and is expected to cause midlatitude ozone layer depletion. Comparison of the model ozone to observations suggests that  $\text{N}_2\text{O}_5$  hydrolysis contributed to reduced ozone, but additional chemical and/or dynamical processes are also important.

These findings suggest that if wildfire smoke injection into the stratosphere increases sufficiently in frequency and magnitude as the world warms due to climate change, ozone recovery under the Montreal Protocol could be impeded, at least sporadically. Modeled austral midlatitude total ozone loss was about 1% in March 2020, which is significant compared to expected ozone recovery of about 1% per decade. [...]

*Authors: Susan Solomon, Kimberlee Dube, Kane Stone, Pengfei Yu, Doug Kinnison, Owen B. Toon, Susan E. Strahan, Karen H. Rosenlof, Robert Portmann, Sean Davis, William Randel, Peter Bernath, Chris Boone, Charles G. Bardeen, Adam Bourassa, Daniel Zawada, and Doug Degenstein*

[The Proceedings of the National Academy of Sciences \(PNAS\), 1 March 2022](#)

Image: PNAS website

### **4. Two additional regions of Asia were sources of banned ozone-destroying chemicals**

A follow-up investigation by NOAA scientists into the sudden increase in emissions of an ozone-destroying chemical between 2010 and 2018 has determined that three regions of Asia - not just one - were responsible for rising emissions of the banned chemical.



In a paper published in the journal *Atmospheric Chemistry and Physics*, analysis of air samples, including those taken during two major airborne research campaigns, confirmed increased emissions of CFC-11 from eastern China, but also found significant increasing emissions from temperate western Asia and tropical Asia.

Lead author Lei Hu, a CIRES scientist who studies CFCs and other ozone-depleting trace gases working at NOAA's Global Monitoring Laboratory, said her team analyzed a large set of high-quality, well-distributed air samples collected by the scientific community during that time period.

"Once we analyzed NOAA measurement data from samples collected all around the world and at different elevations in the atmosphere, we were able to account for most of the observed increase in emissions," Hu said.

### **Engineering triumph turned planetary scourge**

Chlorofluorocarbons, or CFCs, were once considered a triumph of modern chemistry. Stable and versatile, these chemicals were used in hundreds of products, from military systems to the ubiquitous can of hairspray.

In 1987, NOAA scientists were part of an international team that proved this family of wonder chemicals was damaging Earth's protective ozone layer and creating the giant hole in the ozone layer that has formed over Antarctica every year. The Montreal Protocol, signed later that year, committed the global community to phasing out their production. Production of the second-most abundant CFC, CFC-11, would end completely by 2010. Except that it didn't.

### **Years of vigilance yielded unwelcome discovery**

In 2018, Hu's colleague Stephen Montzka, published a paper in the journal *Nature* that rocked the scientific world by describing what turned out to be the first known violation of the Montreal Protocol's ban on the production and use of CFC-11. Based on analysis of data collected at the Global Monitoring Laboratory worldwide network of sampling sites, scientists were able to demonstrate that emissions of CFC-11 had mysteriously increased by 25%, suggesting the presence of new production in violation of the protocol.

Montzka and NOAA colleagues contributed to a companion study led by scientists with the Advanced Global Atmospheric Gases Experiment (AGAGE) and published in 2019, which determined that at least 40 to 60 percent of the CFC-11 global emissions increase came from eastern mainland China. However, it remained unclear where the rest of the emission increase came from.

### **Airborne sampling campaigns were key to new findings**

In this new work, by augmenting NOAA's ongoing sampling network at Earth's surface with measurements from the two short-term airborne campaigns, ATom and HIPPO, NOAA's continuous in-situ air measurements and regular aircraft profiling, the researchers were able to enhance their ability to quantify emissions on regional to continental scales, particularly from Asia.

With the additional data, time, and the help of NOAA's HYSPLIT atmospheric transport model, which allowed scientists to track air motions back in time and identify upwind source regions, Hu's research team from the Global Monitoring and Chemical Sciences labs were able to attribute nearly all of the 2012-2017 emission rise to the three regions in Asia.

Sampling network boost would improve precision of source identification

---

Despite the success in detecting the rising CFC emissions, there are still substantial uncertainties in the estimates of regional and continental emissions derived by the researchers, as significant gaps remain in global sampling networks, Hu said.

These sampling gaps mean that scientists could have difficulty identifying the sources of any future unexpected increases in global CFC-emissions, changes could go unattributed, making in-time recovery of the ozone layer more difficult.

Additional sampling locations and frequency, particularly downwind of undersampled regions such as Asia, Africa, and South America, would improve scientists' understanding of global atmospheric composition changes, and make mitigation of associated ozone layer and climate impacts more timely, efficient, and effective.

On the other hand, failure to address the substantial sampling gaps mean that unexpected future global changes could go unattributed, making in-time recovery of the ozone layer more difficult.

*This research was funded by NOAA, NASA, and the National Science Foundation, with support from CIRES.*

### [National Oceanic and Atmospheric Administration \(NOAA\), 9 March 2022](#)

Image: NOAA website

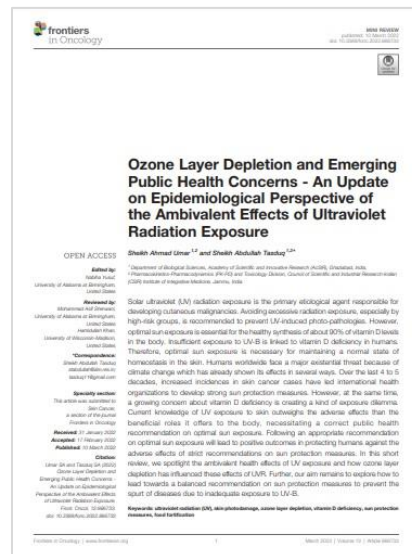
## 5. Ozone Layer Depletion and Emerging Public Health Concerns - An Update on Epidemiological Perspective of the Ambivalent Effects of Ultraviolet Radiation Exposure

[...]

### Introduction

Ultraviolet radiation, the main component of sunlight, is divided into three categories, UV-A, UV-B and UV-C based on the wavelength and energy status (1, 2). UV-B has high energy and potential than UV-A to cause the biological damage (3). In contrast, UV-C is retained by the ozone layer and never reaches the lower atmosphere (4). The average UV dose across the globe varies with geographical location and on daily to seasonal timescales. The total ozone is generally lowest at the equator and highest in mid-latitude and Polar regions. This way, the global distributional pattern of UV index varies with the latitude, altitude, cloud cover and haze and is further complicated amid the ozone layer depletion scenario.

Therefore, no definite UV dose can be attributed to a particular region across the globe (3). However, substantial UV index changes have happened over the last few decades due to ozone layer depletion that has significantly increased the global burden of skin cancer incidences. The recovery of the ozone layer will depend on how countries abide by the Montreal Protocol treaty terms by the participating countries in times to come and if they



take the treaty terms very seriously (5). The impact of future climate change on the ozone layer will vary between the tropics, mid-latitudes and Polar regions and strongly depends on future emissions of ozone-depleting substances. During the long recovery period, volcanic eruptions could temporarily reduce the global ozone levels for several years. Together, these all things will be playing pivotal roles in controlling the global UV changes and the after-effects that ozone layer depletion can have on the different life forms across the globe (6–10).

Likely, fair-skinned individuals are at the highest risk of developing the UV mediated photodamage responses differentially varying with different skin types (11). Yet, most skin types are prone to sun damage with ever-increasing exposure to UV radiation (12). UV radiation not only affects humans but the animal, plant and marine life is also significantly impacted (13). There is a growing concern that ozone layer depletion may lead to the loss of many threatened plant species and disrupt the global food security (14). However, plants have built the ability to respond and adapt to high UV levels; they can be affected directly due to high UV radiations (15), affecting most plant species' survival (16).

The adverse effects of ozone depletion on marine ecosystems can be many, including reducing the population of tiny marine organisms due to small increases in UV, significantly disrupting the marine ecosystem (17). An increase in UV-B radiations reaching the earth's surface may also disrupt and change the natural pattern of biogeochemical cycles and contribute to biosphere-atmosphere feedback, which could have even more deleterious effects on different life forms (18). Although the risks of UV radiation overexposure are known and many (Table 1), the general public have been made to think about the ill effects of UV and not to weigh the merits of UV radiation exposure being essentially crucial for Vitamin D synthesis.

The production of 10µg (400 IU) of vitamin D per day takes approximately 1/3 of the time needed to reach the Minimal Erythral Dose (MED) for an effective skin area of 600cm<sup>2</sup> for skin phototype III. It indicates that UV exposure has strict bodily requirements to synthesize these required amounts of Vitamin D for proper bone formation and function (19). The optimal UV dose for vitamin D production varies significantly depending on the physiological and pathological condition of every individual. The best assessment of these personal attributes can allow people to find their unique "Goldilock" zones of exposure time.

This mini-review highlights the ambivalent biological effects of UVR and how these effects can further modulate if the overhead ozone cover continues to change negatively in the future. It further highlights how to lead towards a suitable public health recommendation on optimal sun exposure amid the climate change triggered ozone layer depletion. [...]

[Frontiers in Oncology, 10 March 2022, By Sheikh Ahmad Umar, Sheikh Abdullah Tasduq](#)

*Image: Frontiers website*

---

## 6. Ozone Community Recognized as Critical to Making 'Great Things Happen'

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer not only put the stratospheric ozone layer on the road to recovery and kept humanity safe from harmful ultraviolet radiation, but it has also done more than any other agreement to slow catastrophic global warming. The success of this treaty has hinged on a combination of factors, among them the purposeful and effective collaboration within the Ozone community, recognized in a new book out today, ***Partnering: Forge the Deep Connections That Make Great Things Happen***, by Jean Oelwang.

*Partnering* explores how building deep business and personal relationships lays the foundation of a meaningful life. She draws from the wisdom of many legendary partnerships including Jimmy and Rosalynn Carter, Ben and Jerry, Desmond and Leah Tutu, and the collective started by Mario Molina and F. Sherwood Rowland that saved humanity by protecting stratospheric ozone.

Among the sixty great partnerships who have made a profound difference – ranging from business partners, to friends, to life partners – Oelwang spotlights Director of Research at the Institute for Governance & Sustainable Development (IGSD) Dr. Stephen O. Andersen, Nobel Laureates Mario Molina and F. Sherwood Rowland, and former Executive Director of the United Nations Environment Programme Mostafa Tolba, as key partners responsible for addressing the first great threat to the global atmosphere.

*Partnering* also recognizes Brian G. Gardiner, Jonathan Shanklin, and Joseph Farman (who made the discovery of the 'Ozone hole' in the 1980s), and Dr. Penelope Canan, and Dr. Nancy Reichman.

"The Montreal Protocol is the most successful international environmental treaty ever agreed," said Dr. Stephen O. Andersen. "Read Jean Oelwang's inspiring book to find hope for future generations."

"Without the tireless work of the Ozone community, we would be facing even greater climate impacts, many of which would be irreversible and catastrophic," said IGSD President Durwood Zaelke. "*Partnering* serves as a reminder of what the Ozone community accomplished with lessons to protect the climate before it is too late."

***Partnering: Forge the Deep Connections That Make Great Things Happen*** is available for order [here](#)

[Institute for Governance & Sustainable Development - IGSD, 8 March 2022](#)

Image: IGSD website







## "Cooling Matters": World Refrigeration Day 2022 Theme

Food available when and where we choose. Apps that make our cell phones personal assistants and inanimate products SMART. Vaccines to protect us from disease, and medicines to cure disease. Cities thriving in places once inhabitable. They all require cooling.

"Cooling is at the very heart of modern life. It enables people to live and work comfortably, it saves lives, it enables people to achieve. The need for cooling is everywhere, it touches lives in fantastic, though often unnoticed ways. However, we look at it, cooling matters to us." said Steve Gill, founder of World Refrigeration Day. "Cooling Matters will tell the story of how our wellbeing depends upon cooling and how cooling technology choices can safeguard the well-being of future generations.

We encourage the whole refrigeration and air-conditioning industry to join us in celebrating World Refrigeration Day 2022. Join the global community conversation using the hashtags #coolingmatters and WREFD22."

Learn more about [World Refrigeration Day "Cooling Matters"](#)  
Contact [info@worldrefrigerationday.org](mailto:info@worldrefrigerationday.org)

## World Refrigeration Day is celebrated on and around June 26

[The Future of Cooling and Heating in 2022](#) - The ATMO World Summit will feature global webinars from industry leading companies working with natural refrigerant technologies, to discuss the future of cooling and heating worldwide.

The World Summit 2022 will be a full day online event (24 hours) with on-the-hour webinars starting at 10:00 am on 30 March in the Central European time zone, followed by the Americas and then Asia Pacific.

The event will include webinars and presentations covering natural refrigerants like CO<sub>2</sub> (R744), hydrocarbons, ammonia/NH<sub>3</sub> (R717), water and air. Many industry stakeholders will attend from end users, contractors, consultants, manufacturers, policy makers and academia. Topics discussed will range from technology to market trends and policy.

Covid has changed the market for natural refrigerants. What is the new future?



### **Call for nominations now open for Scientific Prizes at IIR Congress 2023**

- Don't miss out on your chance to apply for the prestigious academic and scientific awards to be presented at the upcoming 26<sup>th</sup> IIR International Congress of Refrigeration. In anticipation of the 26<sup>th</sup> IIR International Congress of Refrigeration (ICR) to take place in Paris (France) in August 2023, the IIR is launching a call for nominations for several scientific prizes. The series of prestigious academic and scientific awards **recognise those who have made outstanding contributions to the field of refrigeration or have completed noteworthy research.**



The prizes presented will be the:

- IIR Gustav Lorentzen Medal
- IIR Science And Technology Medal
- IIR Young Researchers' Awards

**Application deadline: April 30, 2022**  
[International Institute of Refrigeration \(IIR\), 11 February 2022](#)

[Find out how to apply](#)

*Image: IIR website*

## AFRICA

### **7. Kenyan women in the RAC sector say 'yes' to Green Cooling**

On 17<sup>th</sup> February 2022, a one-day refresher on the safe use of hydrocarbons for women in the refrigeration and air conditioning (RAC) sector was held at the Nairobi Technical Training Institute, Kenya. It served to better understand the motivation, challenges, and opportunities for women working in this sector and to encourage them to pursue careers in this area.

11 women working as RAC experts/technicians from different organisations attended the training. They unanimously said that women should fill the gap in the skilled workforce in the field of Green Cooling technology, especially with regards to the safe use of natural refrigerants. The participants were interested in advancing the use of environmentally friendly and sustainable cooling technologies on the Kenyan market. Some of the challenges that became glaringly obvious were discrimination, tough working conditions (especially high heights on buildings), difficulties during pregnancy, and sexual harassment among others. Capacity building and awareness raising were among the top recommendations to tackle these challenges.



GIZ Proklima, which is funded by the German Federal Ministry of Economic Cooperation and Development (BMZ) and the Federal Ministry of Environment, Nature Conservation and Nuclear Safety (BMU), in collaboration with the National Ozone Unit (NOU) of the Ministry of Environment and Forestry, Kenya, has been conducting various trainings for RAC technicians on the safe use of hydrocarbons and other natural refrigerants throughout the country.

Over 1,000 RAC technicians have been trained and slightly over 60 (6%) are women. The big gender disparity needs to be addressed and could help in achieving gender equality and empowering women and girls by 2030, as set out in the Sustainable Development Goal 5.

### [Green Cooling Initiative, 24 February 2022](#)

*Image: Green Cooling Initiative website*

## 8. Sustainable cooling experts gather in Washington for global food loss summit

Sustainable food, cooling and cold-chain experts from around the globe are gathering in Washington D.C to create a blueprint for rolling out affordable solutions to help African food producers reduce waste and reduce their carbon footprint.

The Africa Centre of Excellence for Sustainable Cooling and Cold Chain Summit will take place in the United States on 15 March to identify partnership and investment opportunities to scale up the impact of existing initiatives across Africa.

The Summit is co-organised by the Centre for Sustainable Cooling, the Millennium Challenge Corporation (MCC), the United Nations Environment Programme's United for Efficiency initiative (U4E), and the U.S. Department of Agriculture (USDA).

They will focus on sustainable and scalable cold-chain solutions – such as optimising energy efficiency, renewable energy, alternatives to conventional cooling, low global warming potential refrigerants – that can be quickly and easily deployed.

Toby Peters, Co-Director, Centre for Sustainable Cooling and Professor of Cold Economy at the University of Birmingham, said: "Food saved is as important as food produced, since we must boost food availability by around 60% by 2050 to feed our growing global population. Up to 40% of food is lost between farm and market in sub-Saharan Africa.



“This Summit will help us to share learnings, identify the skill, business models and support and collaborations needed to accelerate the transition to sustainable cooling meeting the needs of African farmers and supply chains fit for their operating environments.”

In Africa, some 80% of farms are smaller than two hectares and produce 70% of the continent’s total food. Lack of effective cold-chain is estimated to directly result in losses of 526 million tons or 12% of total food production globally, which is worth approx. \$380 billion and enough to feed around 1 billion people. At the same time, 4% of global greenhouse gas (GHG) emissions, including emissions from cold-chain technologies and from food lost due to lack of refrigeration.

Brian Holuj, Programme Management Officer UNEP’s U4E commented: “The Summit will bring together key stakeholders to take the pulse of sustainable cold chain in the region, explore opportunities and showcase ambitious solutions. There are a number of landmark initiatives that offer real hope for progress in reducing food waste and cutting emissions that we can learn from.”

The one-day event and two days of side meetings will feature contributions by select experts from public, private, academic, and civil society communities with a mix of presentations and interactive workshops fostering discussion and an exchange of ideas.

During the events, some of these landmark initiatives will be showcased such as MCC’s Compact with Lesotho on cold chain, USDA’s support for farmers in Kenya and the burgeoning Africa Centre of Excellence for Sustainable Cooling and Cold-Chain (ACES).

Eric Trachtenberg, Senior Director of MCC’s Land and Agricultural Economy Practice Group, commented: “Bringing experts from around the globe together is a great opportunity to create a vibrant discussion about actions we can take that will lead to real change across Africa.”

Hosted by the University of Rwanda at its Kigali campus, ACES is just one example of a global initiative that is set to scale-up its work and develop a pan-continental network of outreach centres. The centre recently received a further \$3,3 million (£2,5 million) funding boost from the UK Government’s Department for Environment, Food & Rural Affairs (Defra).

Steve Cowperthwaite, Head of International Stratospheric Ozone and Fluorinated Greenhouse Gases, Defra, commented: “Building on the ground-breaking ACES programme we are delivering, this Summit can identify real opportunities and partnerships for change that can boost climate friendly, sustainable cold chains in Africa - offering real hope for progress in reducing food waste while simultaneously cutting emissions.”

[University of Birmingham, 8 March 2022](#)

*Image: University of Birmingham website*

## ASIA AND THE PACIFIC

### 9. Cool Roofs Indonesia wins Million Cool Roofs Challenge

---

*Global competition achieves installation of over 1.1 million square meters of new, highly solar-reflective “cool” roofs in developing countries suffering from heat stress and lack of access to cooling.*



Clean Cooling Collaborative, a philanthropic initiative to make climate-friendly cooling accessible to all, today announced Cool Roofs Indonesia as the winner of the [Million Cool Roofs Challenge](#), a global competition to scale the use of solar-reflective “cool” roofs in developing countries suffering from heat stress. Cool Roofs Indonesia was selected among [10 finalists](#) for demonstrating the best sustainable and transferable model for the rapid deployment of cool roofs.

“Lack of access to cooling is deadly and a problem for more than one billion people worldwide. We need to meet the rising demand for cooling with more climate-friendly and equitable solutions,” said Noah Horowitz, director of the Clean Cooling Collaborative. “The Million Cool Roof Challenge showcased the global potential to scale cool roofs, which make buildings more comfortable for their occupants and reduce the incidence of heat stress.”

The Million Cool Roofs Challenge was launched in 2019 as a project of the Clean Cooling Collaborative in collaboration with the Global Cool Cities Alliance, Sustainable Energy for All (SEforALL), and Nesta Challenges. The Million Cool Roofs Challenge awarded \$125,000 grants to [10 finalist teams](#) based in Bangladesh, Côte d’Ivoire, Indonesia, Kenya, Mexico, Niger, Philippines, Rwanda, Senegal, and South Africa. In some of these countries, the teams were the first to introduce highly solar-reflective coating to local residents, practitioners, and officials in their respective countries. Collectively, they installed over 1.1 million square meters of new cool roofs – an area equivalent to 250,000 small household rooftops – in under two years, despite delays stemming from the coronavirus pandemic.

Cool Roofs Indonesia is a partnership of Universitas Pendidikan Indonesia (UPI), Tangerang Municipality, University of Florida, and Milenium Solutions USA. The group ran a pilot project deploying cool roof materials on six residential, community, and public buildings in the Tangerang municipality of Indonesia. Building on the learnings from the pilot project, the team deployed cool roofs in other locations within Indonesia, measuring as much as a 10-degrees Celsius reduction in temperature following some installations. As the Challenge winner, the team will receive an additional \$750,000 to expand cool roofs in Indonesia.

“To bring cool roofs to Indonesia, we had to address barriers to adoption, including the performance of the materials in a tropical climate, a lack of awareness of cool paints, and resource constraints to support installations,” said Dr. Eng. Beta Paramita, assistant professor, Architecture Study Program of Universitas Pendidikan Indonesia (UPI) and

project manager of Cool Roofs Indonesia. "We credit our collaboration with institutional, academic, and community partners for overcoming these challenges to achieve the target and make cool roofs more affordable and accessible to many rural and underdeveloped areas in our country. We're excited to receive additional resources to bring the benefits of cool roofs to more people in Indonesia and hope our learnings help increase the use of this cooling solution around the world."

Read [here](#) to learn more about Cool Roofs Indonesia and their Million Cool Roofs project.

### [Clean Cooling Collaborative, 1 March 2022](#)

*Image: Clean Cooling Collaborative website*

See also >>> [Blogpost: "Million Cool Roofs Challenge: Local Champions for a Global Movement"](#)

## 10. Vanuatu ODS Permit write-off implemented

The ultimate goal of having Regulatory agencies using the same system as Customs is to allow for all the regulatory requirements to be electronically linked to Customs at the point of clearance; any goods that arrive in the country without the regulatory requirements available in the system will not complete Customs clearance.



Customs Officials conducting tests of refrigerant products at the border

Since the launching of the ODS module on 1<sup>st</sup> of December 2021, UNCTAD experts and the Project team have been working on the write-off mechanism which eventually went live on 2<sup>nd</sup> February 2022.

This process was always conducted manually in the past, so you can just imagine the loopholes, the risks, and the administrative burden of maintaining such a control. With this development, no ODS refrigerant or appliance can now enter the country without the system demanding the importer to ensure the appropriate ODS requirements are processed and available in the system at the point of clearance. The control is therefore more enhanced than ever before.

### [Vanuatu Electronic Single Window \(VeSW\) Project monthly newsletter Issue 20/2021](#)

*Image: VeSW website*

## 11. Vietnam Outlines Progress on COP26 Commitments

*Vietnam Briefing follows the progress of Vietnam's commitment of net-zero at COP26, including eight areas that the government is required to focus on. The government is likely to release further decrees on*



implementation including investment incentives for foreign businesses.

Following Vietnam's commitment to net-zero at the [Conference of the Parties](#) (COP26), the government released *Notice No 30/TB-VPCP* on guidance on implementation.

Vietnam's Prime Minister Pham Minh Chinh held a meeting with the National Steering Committee and urged ministries to develop programs and plans to implement Vietnam's commitments at COP 26.

Particularly, the Notice highlights eight areas that government agencies will be required to focus on:

- Transitioning from fossil fuel to green/clean renewable energy sources;
- Reduction of greenhouse gas emissions;
- Reduction of methane, particularly in agriculture and waste management;
- Use of electric vehicles (EVs);
- Sustainable management including using forests and increasing trees to offset carbon emissions;
- R&D for construction material usage and urban development for sustainable development;
- PR campaigns for public and businesses to increased awareness and support for the government's COP26 commitments; and
- Step up adoption of digital economy to address climate change.

With this, the Ministry of Industry and Trade (MoIT), the Ministry of National Resources and Environment (MONRE), and relevant government agencies are expected to release further guidance on implementation.

While the revised Law on Environment will go to some degree to mitigate greenhouse gas emissions and is consistent with COP26, implementation will be key. Low or minimal emissions will play a major role if Vietnam wants to change from fossil fuels to low emissions.

To this effect, the government is likely to issue a new Decree on mitigating greenhouse gases while protecting the ozone layer, as well as setting up committees to promote laws and policies, admin reforms, and so on for climate-proof infrastructure and renewable energy. [...]

[Vietnam Briefing, 4 March 2022, By Dezan Shira & Associates](#)

Image: Wikimedia website



[Asia Pacific Ozone2Climate Art Contest](#) organized by the Asia-Pacific Regional Network of Ozone Officers, as part of UNEP's

workplan under the Montreal Protocol's Multilateral Fund. **The Art Contest will run its course and close on 31 March 2022**, followed by the regional contest of nominated winners. The final winners in the three categories of artworks - photography, drawing, and graphic design, will be evaluated and announced on World Ozone Day in 2022.

For more information about the contest, please visit: [www.ozone2climate.org](http://www.ozone2climate.org)

**Contact:** [Shaofeng Hu](#), Senior Montreal Protocol Regional Coordinator, UNEP, [OzonAction](#) Compliance Assistance Programme (CAP) Asia-Pacific.

*Image: OzonAction*

## WEST ASIA

### **12. Oman National Committee for Climate Change and the Protection of Ozone Layer put stress on the country's policy priorities**



The meeting of the National Committee for Climate Change and the Protection of the Ozone Layer put stress on the country's policy priorities in which climate affairs stands on the top.

The meeting was held in Muscat, chaired by Nayef bin Ali al Abri, President of the Civil Aviation Authority.

The event, which saw the participation of 31 members from various relevant authorities, highlighted the Department of Climate Affairs requirements in the Sultanate of Oman, the compliance with the Montreal Protocol, and the National Strategy for Adaptation and Mitigation of Climate Change (2040-2020).

Speaking on the occasion, Al Abri said the Sultanate of Oman has been subject to many adverse effects of climate changes, as it has witnessed many extreme weather conditions and destructive cyclones, a rise in temperatures, and a change in the pattern of precipitation.

He emphasised the Sultanate's interest in confronting the negative effects of the risks of climate change and contributing to reducing its challenges at the national and international levels, and in line with the priorities of Oman Vision 2040.

The committee's role is to contribute to the proposal and implementation of the necessary policies and national action plans to mitigate greenhouse gas emissions, adapt to the negative impacts resulting from climate change, and protect the ozone layer in line with Oman's 2040 vision.

It will also follow up on the decisions and recommendations of the meetings of the parties to the agreements and ensure that the obligations of the Sultanate of Oman towards those agreements are fulfilled. It will also contribute to the preparation of national strategies related to climate affairs and the protection of the ozone layer and follow-up on their implementation.

The committee added that it would suggest ways to qualify and groom national cadres and build capacities in the field of climate affairs and the protection of the ozone layer by periodically reviewing the progress of work.



## NORTH AMERICA

### 13. US Feds Sentence Refrigerant Smuggler to Probation, Must Pay \$250,000 Fine

There have been jokes in the HVAC industry about smuggling R-22 ever since the refrigerant phasedown was announced a few years ago. But a Fort Worth, Texas, man isn't laughing after getting sentenced for doing just that. Faiz Abdallahi was ordered to pay a \$250,000 fine and will serve three years' probation.

Abdallahi pleaded guilty in October 2021 to the improper importation of a class II substance. This is a felony under the Federal Clean Air Act. He was sentenced March 1 in U.S. Federal Court.

According to plea paper, Abdallahi admitted he smuggled R-22 into the U.S. without an authorized permit in 2017. Following the implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer in January 2010, the import of R-22 was limited, although still legal with a permit in 2017. As of 2020, the importation of R-22 was completely banned. Only recovered, recycled, or reclaimed supplies of R-22 are currently available, though consumers are not required to stop using R-22 air conditioners.

Abdallahi admits he arranged for Chinese R-22 to be delivered to the port of Long Beach, California. He then transported it via rail to the Dallas/Fort Worth area. Abdallahi disguised the canisters as R32 to avoid seizure by the US Customs and Border Protection.

Sivero Zamora, Abdallahi's co-conspirator, then re-packaged and sold the R-22 to HVAC contractors. Zamora pleaded guilty in January to being an accessory after the fact. He was sentenced to six months' probation.

#### Agencies Crackdown on Smuggling

The investigation was conducted by the U.S. Environmental Protection Agency's Criminal Investigation Division and Homeland Security Investigations. Todd "Tony" Adams, assistant special agent in charge of the EPA's Southwest Area criminal enforcement program said the arrest was part of an ongoing effort to crackdown on the illegal importation of R-22.

"The defendant's intentional disregard for the environment included the illegal sale of hydrochlorofluorocarbon-22 (R-22), a restricted substance which not only damages the ozone layer that protects people from the harmful effects of ultraviolet radiation, but also contributes to climate change," Adams said. "EPA and our federal partners continue to hold



accountable companies and individuals that place public safety and the environment at risk.”

Smuggling illegal refrigerants is an international problem. Last summer, Europe’s Environmental Investigation Agency released a report titled “Europe’s Most Chilling Crime – The illegal trade in HFC refrigerant gases.” The report shows that 2020, 281 tons of HFCs were seized in 59 separate seizures in six European Union member states. The number of seizures has been declining, but the total tonnage has been increasing.

[ACHR News, 7 March 2022, By Ted Craig](#)

*Image: ACHR website*

## EUROPE & CENTRAL ASIA

### 14. UNIDO to offer expertise for Turkmen energy sector

United Nations Industrial Development Organization (UNIDO) will offer Turkmenistan its expertise in addressing such areas as resource efficiency and cleaner production, biosafety, water management, renewable energy, and industrial energy efficiency, UNIDO told Trend.



In addition, the organization is keen on continuing its partnership with the government of Turkmenistan in the modernization of Turkmenistan’s industrial sector, as well as in the promotion of industrial zones, science, eco- and technology parks, the development of a quality infrastructure, investment, and technology promotion.

According to the information, UNIDO will continue to strengthen its technical cooperation with the government of Turkmenistan and to provide its accumulated technical knowledge and expertise, as well as help the country access international platforms and broad networks to operationalize the country’s industrial development priorities.

"We believe this will support the fulfillment of the objectives set in the National Socio-Economic Development Programme of Turkmenistan for 2011–2030," UNIDO said.

It is noted that the organization is collaborating with the government of Turkmenistan in its efforts towards achieving inclusive and sustainable economic growth.

Moreover, it is also working in diversifying the country’s economy, promoting private sector development, strengthening agro-industries, protecting the environment, and facilitating the development of alternative energy sources as part of the 2021-2025 Sustainable Development Cooperation Framework.

According to the organization, UNIDO has a number of ongoing projects in Turkmenistan.

---

"We have been working in Turkmenistan on implementing two stages of the HCFC Phase-Out Management Plan (HPMP). The HPMP is a program that helps the country reduce its consumption of Hydrochlorofluorocarbons (HCFC), in line with the Montreal Protocol reduction schedule. HCFCs are controlled substances under the Montreal Protocol; they do not only deplete the ozone layer but also have high global warming potential," UNIDO said.

[Trend News Agency, 21 February 2022, By Amina Nazarli](#)

Image: Wikipedia website

## 15. La Guardia Civil desmantela en el País Vasco una organización dedicada al traslado ilícito de chatarra electrónica a países de la costa africana



Durante la ejecución de la operación Hozkailu se ha detenido e investigado a 18 personas que acumulaban grandes cantidades de residuos para exportar a África sin autorizaciones ni tratamientos adecuados

Los investigadores han detectado el envío de más de 10.000 toneladas de residuo con destino Nigeria y Ghana principalmente, detectándose movimientos de capital superiores al millón y medio de euros

El SEPRONA constata delitos de traslado ilícito de residuos, contrabando, pertenencia a grupo criminal, apropiación indebida y blanqueo de capitales entre otros. [...]

La elevada generación de residuos constituye un problema medioambiental grave de las sociedades modernas, de ahí las necesidades de una normativa estricta que asegure y garantice una correcta gestión de reciclaje.

El Foro Económico Mundial dictamina que el tratamiento irresponsable de la basura tecnológica provoca daños irreparables en la salud de las personas y en el medio ambiente.

Así mismo la Convención de Basilea de Naciones Unidas, regula el tráfico de residuos peligrosos entre países y prohíbe que los estados desarrollados envíen estos residuos a países en vías de desarrollo, porque no cuentan con infraestructuras necesarias para una correcta gestión del reciclaje. No obstante, los residuos siguen inundando países como Nigeria o India, convirtiéndolos en auténticos vertederos tecnológicos.

La incorrecta gestión de muchos de los residuos descubiertos en esta operación, conllevaría la emisión a la atmósfera de gases de efecto invernadero que afectan a la capa de ozono. Además, en el caso de los vehículos al final de su vida útil, éstos contienen una cantidad importante de contaminantes y residuos peligrosos que se han de gestionar adecuadamente, ya que los metales pesados que se producen de su mala gestión pueden llegar a la cadena trófica, a través de ríos y zonas costeras. [...]

[La operación] ha contado también con la colaboración de EUROPOL e INTERPOL en el análisis de las comunicaciones y en el análisis estratégico de documentación para hallar posibles relaciones con otros países, movimientos de divisas e información de envíos; así como con la colaboración de la Subdirección General de Economía Circular del MITERD (Ministerio para la Transición Ecológica y el Reto Demográfico) en equipos de trabajo conjuntos encaminados al estudio sobre la ilegalidad de los envíos.

---

[La Guardia Civil España, 9 de marzo 2022](#)

Image: Guardia Civil website

## FEATURED



## OZONE SECRETARIAT

Overview for the meetings of the ozone treaties in 2022

[68<sup>th</sup> IMPCOM](#), Venue – to be determined, | 09 July 2022

[44<sup>th</sup> OEWG](#), Venue – to be determined, | 11 - 15 July 2022

[69<sup>th</sup> IMPCOM](#), Venue – to be determined, | 29 October 2022

[33<sup>rd</sup> MOP Bureau](#), Venue – to be determined, | 30 October 2022

[34<sup>th</sup> MOP](#), Venue – to be determined, | 31 October - 04 November 2022

Click [here](#) for past and upcoming Montreal Protocol Meetings Dates and Venue.

Upcoming meetings	
2022	
<a href="#">68th IMPCOM</a>	Venue – to be determined,   09 Jul 2022
<a href="#">44th OEWG</a>	Venue – to be determined,   11 - 15 Jul 2022
<a href="#">69th IMPCOM</a>	Venue – to be determined,   29 Oct 2022
<a href="#">33rd MOP Bureau</a>	Venue – to be determined,   30 Oct 2022
<a href="#">34th MOP</a>	Venue – to be determined,   31 Oct - 04 Nov 2022

Summary of the Combined Twelfth Meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer (part II) and the Thirty-Third Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer: 23-29 October 2021.

[The Earth Negotiations Bulletin, 1 November 2021, Vol. 19 No. 157](#)

See also >>> [IISD Daily coverage and photos](#)

### 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.

[The course is hosted on InforMEA](#), the United Nations information portal on Multilateral Environmental Agreements (MEA). The portal is a one-stop information hub on international environmental law searchable by key terms across treaty texts, COP/MOP decisions, national plans and reports, laws, court decisions and more. In addition, part of the platform is dedicated to e-learning containing around 40 free online courses on topics related to MEAs.

The Ozone introductory course, found under 'Climate and Atmosphere', is a self-paced course that allows navigating the lessons at your convenience and takes about 2-4 hours to complete, excluding additional materials. On completing the course and taking a final quiz, you will obtain a certificate.

The Ozone Secretariat is developing an advanced course to complement the introductory one with further insight and deep dive into the ozone treaties to further enhance the knowledge of our stakeholders.

[United Nations Environment Programme \(UNEP\), Ozone Secretariat, 14 February 2022](#)

*Image: UNEP, Ozone Secretariat website*

### **UNEP Ozone Secretariat launches 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 >>>](#)



## [THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL](#)

- [Consultant vacancy announcement \(Evaluation of regional networks of National Ozone Officers\)](#)
- [Evaluation of regional networks of national ozone officers \(desk study and terms of reference for the second phase\)](#)
- [Evaluation of regional networks of national ozone officers \(desk study and terms of reference for the second phase\): Corrigendum](#)
- [Guide for project preparation of Stage I of Kigali HFC implementation plans \(KIP\) \(February 2022\)](#)
- [Updated guide for the presentation of stage II of HCFC phase-out management plans \(February 2022\)](#)
- [Executive Committee Primer 2022](#)

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

---



## OzonAction

[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*

**New OzonAction Knowledge Maps tool** - The UNEP OzonAction Knowledge Maps tool was developed to provide the National Ozone Units (NOUs) and different UNEP partners with a simple tool to help them access data and information about relevant stakeholders, who are mainly involved in the implementation of programmes and projects under the Montreal Protocol (MP) supported by Multilateral Fund (MLF).

Currently, the first two available knowledge maps are described below:

**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, for the training of technicians and supporting the national policies related to the Montreal Protocol.

**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.



To develop this tool, UNEP OzonAction collected and reviewed different datasets from multiple sources, and then presented the collected datasets into a common platform and format (mainly in the form of a global map so that data can be geographically displayed). Kindly note that the data and information provided will be updated regularly through the feedback that will be received from NOUs and partners to update and/or add new records. Other maps are currently under development which will include access to

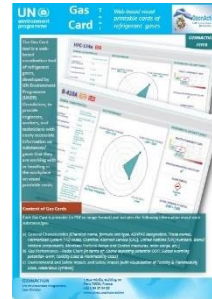
other key data and information of importance to the implementation of Montreal Protocol programmes.

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** developed by the UN Environment Programme (UNEP) OzonAction, to provide engineers, workers, and technicians with easily accessible information on substances/ gases that they are working with or handling in the workplace on visual printable cards.

**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. \*

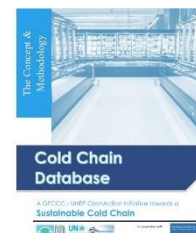
### Using the Gas Gard web-based tool

- 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)*

### 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”. The launch also comes in advance of the United Nations Food Systems Summit.

With the support provided by the Montreal Protocol’s Multilateral Fund, the Cold Chain Database initiative is currently being piloted in six countries – Bahrain, Bosnia and Herzegovina, Maldives, North Macedonia, Paraguay, and Senegal. From the pilot data gathering initiatives, a model is being developed that will allow the projection of benefits of cold chain expansion.

GFCCC is an independent not-for-profit industry organisation that seeks to simultaneously reduce food waste, and related greenhouse gas emissions in the processing, transportation, storage, and retail display of cold food by expanding and improving access to energy efficient low-global warming potential technology. The Cold Chain Database concept, methodology and data collection questionnaires are offered to interested countries and partners to help in assessing local cold chain capacities and designing respective action plans and policies.

> [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 [Ayman Eltalouny](#)

**Contact:** [Ayman Eltalouny](#), Coordinator International Partnerships, UNEP, OzonAction

**United Nations Environment Programme (UNEP), OzonAction**

Image: OzonAction



### [HCFC Quota and Licence Tracker](#) - UNEP

**OzonAction launches 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)

The new and updated UNEP OzonAction **GWP-ODP Calculator** application will help you to convert between values in metric tonnes, ozone depleting potential (ODP) tonnes and CO<sub>2</sub>-equivalent tonnes of substances controlled by the Montreal Protocol and their alternatives.

This application, available at no cost, is particularly useful for National Ozone Officers to assist with understanding and calculating quantities of controlled substances, both pure substances and mixtures, for quota assignment, reporting requirements, etc. Other stakeholders interested in ODP and global warming potential (GWP) values of controlled substances and their alternatives will also find this tool useful.

Operation of the application is very simple – just select a substance from the dropdown list and enter the known value in the appropriate field; the calculator will automatically perform the conversion between metric tonnes, ODP tonnes and/or CO<sub>2</sub>-equivalent tonnes and display the corresponding converted values. The ODP, GWP and information about the

---

substance is provided. For mixtures, the components of the mixture and their relative proportions (metric, ODP, CO<sub>2</sub>- equivalent tonnes) are also calculated.

The updated **GWP-ODP Calculator** application now includes a new Kigali Amendment mode. The app can now be used in two different modes: the regular "Actual Values" mode and the "Kigali Amendment" mode. In the Kigali Amendment mode, the GWP values provided are those specified in the Kigali Amendment to the Montreal Protocol, i.e. GWP values are only assigned to controlled HFCs. In this mode the GWP values used to calculate the refrigerant blends/mixtures only include GWP contributions from components that are controlled HFCs. The user can effortlessly switch between modes.

The OzonAction GWP-ODP Calculator uses standard ODP values and GWP values as specified in the text of the Montreal Protocol to make the conversions. Other ODP and GWP values from the recent reports of the Montreal Protocol Technology and Economic Assessment Panel and Scientific Assessment Panel as well as the Intergovernmental Panel on Climate Change (IPCC) are used when appropriate, with references to sources of all values used. The app includes new refrigerant mixtures (with ASHRAE- approved refrigerant designations).

This application is designed primarily for use by Montreal Protocol National Ozone Units and other related stakeholders. The application was produced by UN Environment Programme (UNEP) OzonAction as a tool principally for developing countries to assist them in meeting their reporting and other commitments under the Protocol and is part of the OzonAction work programme under the Multilateral Fund for the Implementation of the Montreal Protocol.

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](#) for more information

## OzonAction [WhatGas?](#) Updated

### New features:

- An updated more user-friendly interface
- Multilingual interface: English, French and Spanish
- HFCs and HFC containing mixtures
- Latest updated ozone depleting potential and global warming potential values from the recent reports from the Montreal Protocol technology and scientific expert panels as well as the



Intergovernmental Panel on Climate Change; as well as the standard ODP and GWP values as specified in the text of the Montreal Protocol

- References to sources of all values used
- New refrigerant mixtures (with ASHRAE approved refrigerant designations)
- Values for 'actual GWP' and 'Kigali Amendment context' GWP for pure substances and mixtures (i.e. only including GWP values/components assigned to controlled hydrofluorocarbons - HFCs).

**The WhatGas?** application is an information and identification tool for refrigerant gases: ozone depleting substances (ODS), HFCs and other alternatives. It is intended to provide a number of 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. If the user requires additional information or assistance in identifying a refrigerant gas they are inspecting or that is described in the relevant paperwork, this can be easily obtained by consulting the application.

#### Using the application:

If you already have the application installed on your device, be sure to update to benefit from the new features.

**Smartphone Application:** Just search for "WhatGas?" or UNEP in the Google Play store or use the QR code – free to download!



**Desktop Application:** WhatGas? is also available online on the OzonAction [website](#)

**For more information:** Watch the new short introductory tutorial [video](#) on WhatGas? available on [YouTube](#)

See/download the [WhatGas? flyer](#)

**Over 10,000 installations on Android and iOS devices to date!**

#### [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.

The purpose is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an “R” number (or ASHRAE designation) over the last few years and which have been introduced into the international market.

Read/download the [factsheet](#)

The factsheet, as well as more information on ASHRAE-UNEP joint activities and tools, is also available on the [ASHRAE UNEP Portal](#).

**Contact:** [Ayman Eltalouny](#), 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 hydrochlorofluoro-carbons (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.

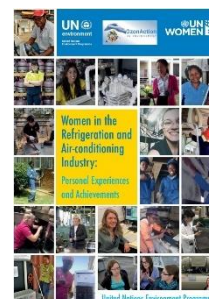


### **[Women in the refrigeration and air-conditioning industry: Personal experiences and achievements](#)**

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 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](#)



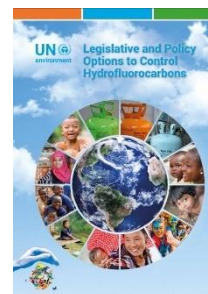
## PUBLICATIONS

### 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.

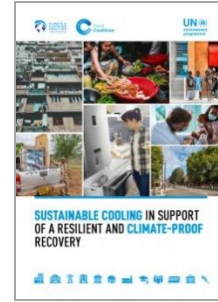
[Read/download](#)



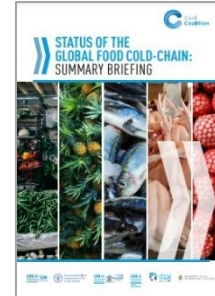
Latest issue of Centro Studi Galileo magazine, **Industria & Formazione**, n. [2-2022](#) (in Italian).



[Sustainable Cooling in support of a Resilient and Climate Proof Recovery](#), Report by the Climate and Clean Air Coalition (CCAC), 2021



[Status of the Global Food Cold-Chain: Summary Briefing-Food Cold Chain Food saved is as important as food produced](#). The UNEP-led Cool Coalition in collaboration with the Climate & Clean Air Coalition (CCAC), United Nations Environment Programme (UNEP), United Nations Food and Agriculture Organization (FAO), OzonAction and the Ozone Secretariat, with the support of the Italian Government, are producing a status report on the global food cold-chain, which will include case studies to show the current state and development across areas such as technologies, design approaches, finance and business models, policy, and planning. This brief is a short summary of the full report that will be published in December 2021. The aim is to help better identify and accelerate solutions to simultaneously feed the world, support smallholder and marginal farmers, and protect our environment.



[Cool Coalition Secretariat, September 2021](#)

*Image: Cool Coalition*

[Leaks, maintenance and emissions: Refrigeration and air conditioning equipment report](#) details common faults identified in both residential and commercial refrigeration and air conditioning equipment. The report also lists the impacts of these faults and how routine maintenance of the equipment has the potential to significantly reduce electricity use, refrigerant leaks, and emissions.



*The research was supported by an extensive survey of international and domestic literature included as Appendix B to the report.*

[Australian Government, Department of Agriculture, Water and the Environment, Expert Group, 2021](#)



**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.*



**"Refrigerant Emissions Alternatives and Leakage - blended learning for low GWP refrigerants" - On 2<sup>nd</sup> March more than 370 participants joined the live Real Alternatives' webinar "Refrigerant Emissions Alternatives and Leakage - blended learning for low GWP refrigerants" for 3 hours of presentations with simultaneous translation in 6 languages and 13 speakers.**



If you missed this important webinar, you can click [here](#) to access the registration of the event, making it possible to benefit from the event even for those who have not been able to join live (almost **700 registrations** were received).

Great feedback was obtained both from the experts and from the participants in the event: the presentations provided a valuable overview of the current situation of **alternative refrigerants** with low-GWP and how the **REAL Alternatives** project, today with 20 member countries, can support companies, technicians and associations in the transition towards new systems and safety while respecting the environment.

In addition to the experiences reported by the representatives of the many associations involved, the event also included two top-level technical presentations, based directly on the courses, by **Marino Bassi** Italy (Good practice for Flammable Refrigerants) and **Kivanç Aslantaş** Turkey (Good practice for Carbon Dioxide).

The entire event was held in English and **simultaneously translated** into 5 European languages.

The REAL Alternatives Consortium's aim is that the success of this event will lead to **additional countries joining**, in addition to those of the 20 countries already involved:

further information on this is available on the project's [website](#) and by contacting **REAL Alternatives Ambassador, Mr [Marco Buoni](#)** (ATF Secretary General and AREA President).

**NEW** publication by Stellar: 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:

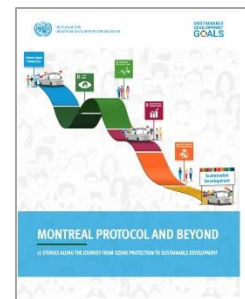
- Safety hazards and health considerations
- Emergency shutdown procedures
- Addressing deviations from system operating limits
- Risks and costs of non-compliance with regulatory standards

Request free Download [here](#)



**NEW** publication by UNIDO: [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](#)



## MISCELLANEOUS

**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*



Click [here](#) for recent OzoNews Issues

[Request a PDF](#) of the current issue

---

**Disclaimer:**

The United Nations Environment (UNEP), Environmental rights and governance division, OzonAction, provides OzoNews as a free service for internal, non-commercial use by members of the Montreal Protocol community. Since its inception in January 2000, the goal of OzoNews is to provide current news relating to ozone depletion and the implementation of the Montreal Protocol, to stimulate discussion and promote cooperation in support of compliance with the Montreal Protocol. With the

exception of items written by UNEP and occasional contributions solicited from other organizations, the news is sourced from on-line newspapers, journals, and websites.

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.

If you have questions or comments regarding any news item, please contact directly the source indicated at the bottom of each article.

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](mailto:samira.degobert@un.org)



UNEP, OzonAction, · 1 rue Miollis · Bat. VII · Paris 75015 · France