

## Volume XXII | 30 March 2022

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**A tribute to Frank Pinto** *(written by his colleagues in UNDP)*

**It is with great sadness that we learned about the passing of Mr. Frank Pinto on 24 March 2022.**

Throughout his illustrious professional career, Frank worked tirelessly to protect the environment and promote sustainable development. He founded the Montreal Protocol /Chemicals Unit at UNDP in 1991 and was its first Director until 2001. Many colleagues remember him as a joyous and a caring person, an excellent friend, and a mentor. He will be fondly missed by many colleagues, friends, and family. Rest in peace, Frank!

Frank has many close friends all over the world, especially in the international community of the Montreal Protocol. He established the Montreal Protocol Unit at UNDP in 1991 and served as its first Director until 2001. He pioneered UNDP activities to support the developing countries to phase out ozone depleting substances in the framework of their pursuit of sustainable development. He built a professional and dedicated team at UNDP with more than dozens of people from all over the world and created a unique culture of unity, positivity, and mutual support like a real family. It is through the efforts of individuals like Frank, the ozone layer is well on the way of recovering by the middle of the century - a true inspiring story and one of the most successful examples to date in addressing the global challenges as stated by the UN Secretary General.

In recent years, Frank Pinto was a Senior Consultant at the United Nations Development Programme (UNDP), where he advised on strategic and policy issues, including on the green economy and waste management. Prior, he was a Joint Technical Editor/Contributor on four UNDP "Lessons Learned" publications launched at the Meetings of the Parties to the Montreal Protocol (2014, 2017), Stockholm Convention (2015) and Minamata Convention on Mercury (2016). He was also Chief Technical Editor of the Dubai Green Economy Reports in 2015 and 2016 and helped establish the World Green Economy Organisation (WGEO) in Dubai in 2016.

From 2001-2007, he was Executive Coordinator/Director of UNDP's Global Environment Facility unit managing 2,500 projects in 130 countries in the areas of climate change, biodiversity, international waters, land degradation and chemicals. Other positions he held include Director of UNDP's Montreal Protocol programme (1991-2001); UN Interregional Energy Adviser (1984-1990); Secretary of the UN Interagency Technical Energy Group (1981-1984); Energy Consultant at the IEA/OECD (1978-1980); and Consultant to the M.I.T. Workshop on Alternative Energy Strategies (1977). He was also a staff member and then consultant (1974-76) at the World Bank, where he was contributor/co-author of the World Bank Staff Working Paper "The SIMLINK trade and development model for developing countries".

Following his retirement from UNDP in 2007, he has advised developing country governments on climate change mitigation and adaptation issues and development

implications, and on the green economy. In July 2009, he delivered the keynote address at the launch of the Qatar 2009 Human Development report “Advancing Sustainable Development”, part of the Qatar National Vision 2030. He was also principal author of “Comparative Experience: Examples of Inclusive Green Economy Approaches in UNDP’s Support to Countries”, presented at the June 2012 Rio+20 Conference in Brazil.

He has advised 70 developing country governments in all regions, has published many papers and reports, and has appeared on TV programmes in Argentina, China, Colombia, Egypt, India, Malaysia, and Zambia. He has received awards from the UN and from governments for his work.

--- UNDP Montreal Protocol Unit (MPU)

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**UNEP is deeply saddened by Frank’s departure, and we too wish to express our appreciation for all that he did for the Montreal Protocol community, for promoting environmental protection in developing countries, and for his cooperation and friendship with colleagues in OzonAction. All of us express our condolences to his family and friends for the loss of this great person.**

## GLOBAL

### 1. Kigali Amendment latest ratifications

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

[United Republic of Tanzania, 25 March 2022](#)

[Spain, Provisional application under Article V, 20 January 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. Meeting arrangements for 89<sup>th</sup> and 90<sup>th</sup> meetings of the Executive Committee

In view of the global COVID-19 situation and the relevant directives released by the

Governments of Canada and Quebec in response to the pandemic, on 18 January 2022 the Secretariat informed the Executive Committee that the in-person 89<sup>th</sup> meeting, planned for 7 to 11 March 2022, in line with decision 87/60(a) would not take place.

Following discussions with the Executive Committee, the following contingency plan was approved:

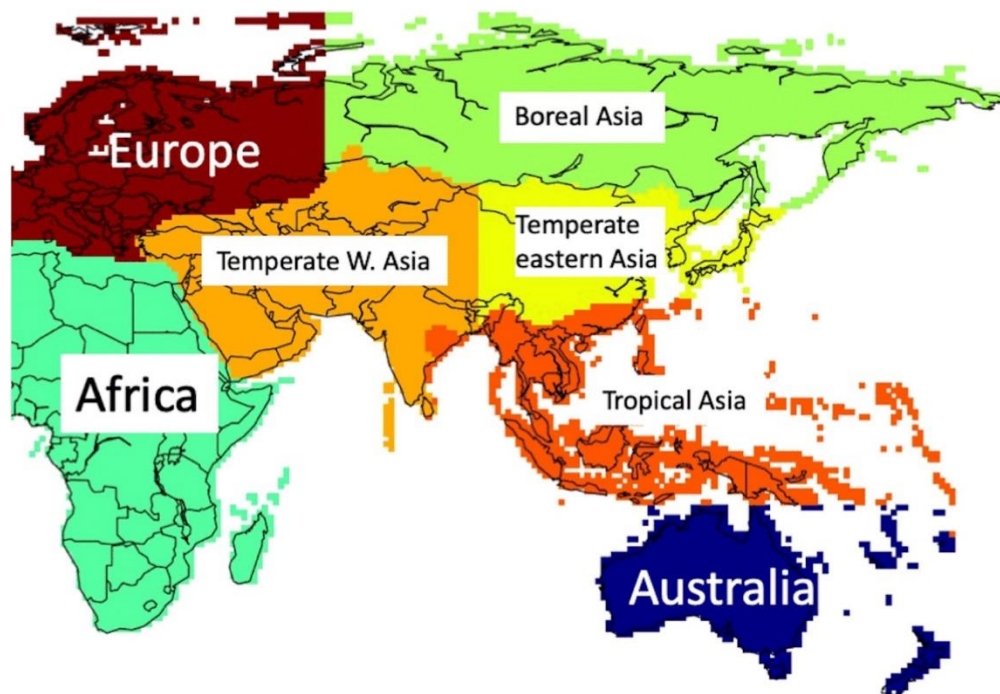
- (a) The 89<sup>th</sup> meeting will be held in two parts:
  - (i) Part I: Virtually, on 16, 18 and 20 May 2022, to consider items listed in the agenda of part I of the 89<sup>th</sup> meeting contained in document UNEP/OzL.Pro/ExCom/89/Add.1;
  - (ii) Part II: In-person, from 16 to 18 June 2022, in Montreal, Canada, at the International Civil Aviation Organization (ICAO);
- (b) A "refresher" informal session for Executive Committee members will be organized on agenda item 7(a) of the 89<sup>th</sup> meeting, development of the cost guidelines for the phase-down of HFCs in Article 5 countries: draft criteria for funding (decision 83/65(d)), on 15 June 2022 from 4 p.m. to 6 p.m., in Montreal, Canada, at Le 1000, Conference Centre; and
- (c) The 90<sup>th</sup> meeting will be held from 20 to 23 June 2022, in Montreal, Canada at ICAO. In light of the Canadian Grand Prix being held the weekend of 17 to 19 June, all attendees are advised to make lodging arrangements as soon as possible.

## [The Multilateral Fund for the Implementation of the Montreal Protocol, March 2022](#)

Image: UNMLF website



## 3. Continental-scale contributions to the global CFC-11 emission increase between 2012 and 2017



CFC-11 made headlines in 2018 when scientists alerted the world of an [unexpected and persistent increase in global emissions of CFC-11](#). Unexpected, because those findings were inconsistent with the requirement for global phase-out of CFC-11 under the Montreal Protocol – the universally ratified international agreement to control ozone-depleting substances to protect the ozone layer.

CFC-11 was a widely produced man-made chemical with a variety of applications – predominantly as an aerosol propellant, in the production of insulating foams, as a solvent and as a refrigerant for air conditioners and fridges. Other applications included asthma inhalers and tobacco processing.

The 2018 scientific findings indicated that CFC-11 concentrations were in constant decline from 2002 to 2012 but then slowed down by about 50 per cent after 2012. Further analysis revealed an increase in CFC-11 emissions after 2012 despite reported production being close to zero, suggesting unreported new production.

In 2019, a further study reported on high-frequency atmospheric observations from Gosan, South Korea, and Hateruma, Japan, together with global monitoring data and atmospheric chemical transport model simulations, indicating at least 40 to 60 per cent of the [CFC-11 emissions emanated from eastern China](#). Due to insufficient coverage, the source of the remaining CFC-11 emissions could not be determined. Consideration within the study

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concurred that the increase of unexpected CFC-11 emissions was as a result of new production and use.

Parties to the Montreal Protocol reacted swiftly to deal with these unexpected emissions to keep ozone layer recovery on track by adopting decisions reminding parties of their reporting obligations and the need to combat illegal activities. Furthermore, the Protocol's scientific Assessment Panels were requested to provide additional information on CFC-11 emissions and their potential sources, as well as options to close the gaps in atmospheric monitoring of controlled substances. As a result of the swift response of the parties, by early 2021, [a study revealed that global emissions of CFC-11 had dropped sharply between 2018 and 2019](#), indicating that the long-term downward trajectory of CFC-11 emissions had been restored with no impact to the projected recovery of the ozone layer.

A recent investigation, published by the National Oceanic and Atmospheric Administration (NOAA) in [Atmospheric Chemistry and Physics](#) in March 2022, has quantified changes in continental-scale emissions during November 2009–September 2011 and August 2016–May 2018. Analysis of global atmospheric CFC-11 measurements suggests that emissions from Asia accounted for the largest fractions of global CFC-11 emissions in those periods with an average of 43 per cent and 57 per cent, respectively. They also accounted for an average of 86 per cent of the global CFC-11 emission rise between the two periods.

The study further suggests that besides eastern mainland China, temperate western Asia and tropical Asia also contributed to global CFC-11 emissions during both periods and likely contributed significantly to the increase in global CFC-11 emissions between 2010 and 2018. North America and Europe are found to have accounted for relatively smaller fractions (10-15 per cent each) of global CFC-11 emissions during that period. For continents in the southern hemisphere (South America, Africa, and Australia), the contribution of the derived regional emissions to the global CFC-11 emissions was found to be relatively insignificant.

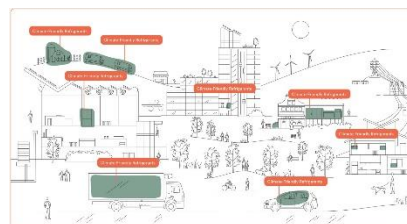
Targeted monitoring of regions of emissions under the Montreal Protocol can address the cause behind the emissions, ensuring the ozone layer recovery timeframe remains on track. One such action targets closing the significant gaps that remain in global sampling networks thereby increasing the ability of scientists to identify the sources of possible future unexpected emissions of not only CFC-11, but also other substances controlled under the Montreal Protocol.

#### [The UN Environment Programme, Ozone Secretariat, March 2022](#)

*Image: UNEP Ozone Secretariat website*

#### **4. Financing the transition to efficient, climate-friendly cooling for all: A review of Clean Cooling Collaborative's finance program**

It's undeniable that global cooling demand is high, and that it's on the rise. In fact, it's expected to triple by 2050. It's also undeniable that we need to find





and adopt ways of ensuring this demand is met with minimal impact on our climate, which won't come cheap.

Unfortunately, there are relatively few examples of financing mechanisms that demonstrate how to support the transition to efficient, climate-friendly cooling. To combat this, we need demonstration projects across a range of geographies that use different applications and financing mechanisms. We also need to disseminate lessons learned and best practices to raise awareness of funding opportunities and to attract capital from new investors.

Since 2018, the Clean Cooling Collaborative finance program has been a lab for action at scale and our work is proof that finance can influence institutions, build on policies and standards, develop supply chains, and raise awareness. The program catalyzed action and assisted in the implementation of projects that will result in additional on-the-ground investment in clean cooling, demonstrating how philanthropy can mobilize finance at scale.

To celebrate this work, the Clean Cooling Collaborative produced a [review of Phase I finance program](#), in collaboration with the Carbon Trust, and published a blog on [financing cooling efficiency](#).

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

Image: CCC website

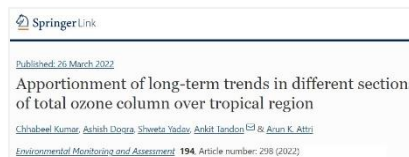
See also >>> [Show me the money: Financing the transition to efficient, climate-friendly cooling for all](#)

## 5. Apportionment of long-term trends in different sections of total ozone column over tropical region

### Abstract

The additive time-series decomposition analysis was performed on National Oceanic and Atmospheric Administration Solar Backscatter Ultraviolet Instrument Merge satellite dataset version 8.6 for the period January 1979 to December 2019 with an objective to detect and apportion long-term trends present in the total ozone column (TOC) and the long-term trends exist in the respective ozone contents present in the vertical sub-columns constituting the TOC viz. upper, middle and lower stratosphere as well as near-surface for the tropical region.

Linear regression analysis was performed on the deseasonalized monthly mean time series of TOC and corresponding ozone contents present in each partitioned layer for three different time spans, viz. 1979–2019 (complete time series), 1979–1998 (pre-inflection years), and 1999–2019 (post-inflection years), where 1998 was taken as inflection year. For the complete time-series, statistically significant negative trends were observed in TOC and corresponding ozone contents in the sub-columns over most of the tropical region.



Expectedly, during pre-inflection years, strong negative trends were noted for TOC and ozone contents in the partitioned vertical layers. In contrast, during the post-inflection year time span, long-term trends in TOC were statistically insignificant over two-third of the tropical region, but one-third of the subtropical region exhibited negative trends in TOC.

During this time span, positive trends were observed in the ozone contents present in the upper stratospheric sub-column. However, negative trends in ozone contents persisted in the middle and the lower stratosphere. It was interesting to note that the ozone contents confined in near-surface layer manifested strong negative trends during pre-inflection years and the same reversed into strong positive trends that in post-inflection span.

The observed, contrasting, long-term trends and variability in the respective partitioned layer of the TOC confounded any clear sign of recovery in the TOC over the tropical region.

The continuation of declining trends in the middle stratosphere and increasing trends in the near-surface layer of ozone contents is a matter of concern.

*Authors: Chhabeel Kumar, Ashish Dogra, Shweta Yadav, Ankit Tandon & Arun K. Attri*

[Springer-Environmental Monitoring and Assessment volume 194, Article number: 298 \(2022\), 26 March 2022](#)

*Image: springer website*

## 6. Comparative investigation of low-GWP binary and ternary blends as potential replacements of HFC refrigerants for air conditioning systems

### Abstract

After decades of using reliable synthetic refrigerants, it is now necessary to look for their low-GWP climate-friendly safe alternatives.

This paper summarizes a search for the best substitutes to commonly used refrigerants and their blends to be used in vapor compression air conditioning systems and temperature conditions typical for a moderate climate. 24 pure refrigerants (including several modern HFOs) were combined (using REFPROP10's mixing functions) in binary and ternary compositions (at 10% mass fraction adjustments) producing 44 915 potential combinations.

This broad database was screened on the basis of theoretical COP, specific cooling capacity, and volumetric cooling capacity which were obtained through simulations of an ideal cycle with the temperature of evaporation 0°C, condensation 38°C and superheating 10 K. Resulting blends were then further sieved on the basis of Global Warming Potential (GWP), discharge temperature, temperature glide, and flammability.

The refrigerants that produced the highest COP under the above screening criteria are: R1311 and its blends. The COP was 4.94, but R1311 is hard to acquire in necessary





quantities. The other high-COP/low-GWP blends contain R1234ze(Z) and/or R1233zd(E), but the evaporator would work below atmospheric pressure.

Further screening returned R152a/R1234ze(E) [0.7/0.3 mass ratio] as the best refrigerant blend for the air conditioning purposes. It is inexpensive, belongs to flammability group 2L, and the ideal refrigeration cycle yields a theoretical COP of 4.861.

*Authors: Tomasz Halon, Bartosz Gil, Bartosz Zajaczkowski*

[Elsevier, 25 March 2022](#)

*Image: Elsevier 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)

However you look at it....



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

**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

[Find out how to apply](#)

**Application deadline: April 30, 2022**

[International Institute of Refrigeration \(IIR\), 11 February 2022](#)

*Image: IIR website*

## AFRICA

### 7. The importance of education and skills training in Uganda's refrigeration sector

*UNIDO Interview with Paulo Odu, National Refrigeration Expert, Uganda*

#### **What are the priority sectors and targeted activities in Uganda's HCFC Phase-Out Management Plan?**

Our biggest priority and greatest achievements under the HCFC phase-out management plan (HPMP) for Uganda has been in the reduction of HCFC consumption in the refrigeration servicing sector. To achieve this, we have worked hard to strengthen capacity building and training of refrigeration technicians across the country.

As a trainer and national refrigeration expert in Uganda, I am very happy with what we have achieved so far. With the support of UNIDO and the United Nations Environment Program (UNEP), we have trained over 300 practitioners in the refrigeration sector of Uganda.

#### **What is the value of skills training in the refrigeration sector?**

Working in the refrigeration sector offers technicians diverse and unique opportunities for professional growth. It encompasses a wide range of scientific knowledge and technical skills, so that anyone who is trained in this field is capable of taking on other skilled jobs, from electrical and electronic maintenance to mechanical engineering. By training refrigeration practitioners, we give them the chance to work in many different fields.

Besides the economic value of skills training in this sector, which translates into qualified workers and better employment opportunities, there is of course the environmental value. Skills training can reduce the risk of improper installation and poor maintenance of refrigeration systems, thereby reducing energy consumption, leakage rates of refrigerant, breakdowns and premature end of life of the systems. Proper training of service technicians therefore results in lower direct (refrigerant leakage) and indirect emissions (energy consumption) and lower costs for the operator or user.

In our training programme, we have categorized four-key elements required of refrigerator practitioners:

1. The trainee must have knowledge of how a refrigerator works, and in particular an in-depth knowledge of electrical systems, an understanding of plumbing and design equations;
2. The trainee must have the necessary skills to safely install and service refrigeration systems;
3. The trainee must have basic equipment for doing the work; and finally
4. The trainee must have positive attributes and work ethic.



When we carry out the training, we touch upon all four areas, in particular the attributes, that is to say, the employable skills. So that when the trainees complete their training and go out to the job market, they have the skills that can attract employment.

#### **Who are the key partners working on this field in Uganda?**

In Uganda, we have worked closely with the Kyambogo University, where all the training for refrigeration technicians and engineers has taken place. This is also where the first refrigerant recovery and reclamation initiative in Uganda began. I myself worked as a refrigeration trainer at Kyambogo University from 1994 – 2015.

The Uganda National Association for Refrigeration and Air-conditioning (UNARA) has grown throughout these years and thanks to the cooperation with UNIDO, we now have four new centres of excellence for vocational training. UNIDO has supported these training institutes through the provision of training equipment and tools, including refrigerant recovery machines, vacuum pumps, and hand-held electronic leak detectors. The training

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institutions are now better equipped to deliver a higher quality of training to refrigeration and air conditioning practitioners in Uganda.

### **What are the next steps and what is your vision for the future?**

Now, with the support of UNIDO, we have expanded our training programme to four additional institutions. And if all goes as planned, we will be expanding to two more institutions to increase the number of skilled students, so that they can move into productive work.

The biggest challenge we face is reaching the practitioners in rural areas of Uganda. Some of them cannot come to us because they do not have the means to reach us, so we need to go to them. We also need to make sure that they have the necessary tools to carry out their work.

Over the past years, we have seen a growing demand for refrigeration and air-conditioning systems. Every new building relies on cooling systems, and all of these cooling systems need to be serviced by trained personnel to reduce damage and operational costs.

This is why we need to go beyond the capital city of Kampala and Kyambogo University. This is what we are now achieving together with UNIDO. We hope to keep expanding our vocational training centres and changing the lives and livelihoods of practitioners across the country.

[The United Nations Industrial Development Organization \(UNIDO\), March 2022](#)

*Image: UNIDO 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*

# NORTH AMERICA

## 8. U.S. Takes Aim at Violators of Greenhouse Gas Phasedown and Reporting Programs

**WASHINGTON (March 15, 2022)** – At its inaugural meeting yesterday, the Interagency Task Force on Illegal Hydrofluorocarbon (HFC) Trade announced that over the past ten weeks, it has prevented illegal HFC shipments equivalent to approximately 530,000 metric tons of CO<sub>2</sub> emissions, the same amount as the emissions from nearly 100,000 homes' electricity use in one year. As of January 1, 2022, when the United States Environmental Protection Agency (EPA)'s HFC Allowance Allocation and Trading program went into effect, the import of HFCs requires allowances. Shipments coming to U.S. ports without proper allowances have been identified, stopped, and re-exported.

In September of 2021, the task force was established when EPA [issued a final rule](#) initiating a comprehensive program to cap and phase down the production and consumption of climate-damaging HFCs in the United States, potent greenhouse gases commonly used in refrigeration and air conditioning equipment. A global phasedown of HFCs is expected to avoid up to 0.5 °C of global warming by 2100. The HFC phasedown is projected to avoid approximately 4.6 billion metric tons of CO<sub>2</sub> from 2022 – 2050 in the United States, or nearly equal to three years' worth of U.S. power sector emissions at 2019 levels. The task force helps ensure the vast environmental benefits of the rule are realized by detecting, deterring, and disrupting any attempts to illegally import HFCs into the United States.

"Our task force is already sending the clear message to potential violators that we are fortifying our borders against illegal imports. It's simple – no allowances, no entry," said Joe Goffman, Principal Deputy Assistant Administrator for the Office of Air and Radiation. "Strict enforcement of our HFC allowance program ensures that U.S. efforts to phase down these climate-damaging chemicals are successful."

"EPA will continue to work in close collaboration with its federal partners to implement a multi-pronged enforcement strategy that includes pursuing civil and criminal violations of the law," said Lawrence Starfield, Acting Assistant Administrator of the Office of Enforcement and Compliance Assurance.

"We are proud of the collaborative work that we have been doing to identify suspicious shipments, investigate them, and punish violators," said Gail Kan, Acting Executive Director of Trade Policy and Programs, Office of Trade, U.S. Customs and Border Protection. "These include shipments that violate laws protecting our environment. The United States is closed to illegal trade – in this case trade that harms our climate. We will continue to ramp up our efforts, so potential violators should beware."



News Releases: Headquarters

### U.S. Takes Aim at Violators of Greenhouse Gas Phasedown and Reporting Programs

March 15, 2022

Contact Information  
EPA Press Office: [epa@epa.gov](mailto:epa@epa.gov)

Violating the AIM Act can result in administrative and civil fines as well as injunctive relief and other consequences including the revocation of allowances. In addition, illegally imported HFCs may be seized by authorities, or the importer required to re-export or destroy the goods, at their cost. Knowing violations of the AIM Act and related smuggling crimes may result in criminal fines, imprisonment, and other penalties as appropriate.

The task force is co-chaired by EPA and the Department of Homeland Security, and includes Customs and Border Protection, Department of Defense, Department of Justice, and Department of State. In addition to stopping illegal imports at the border, the task force also announced that EPA has issued 14 Notices of Violation to companies that have allegedly failed to comply with HFC reporting obligations under the Greenhouse Gas Reporting Program (GHGRP). These companies are HFC importers who received HFC allowances after reporting late. Enforcement of the GHGRP is a necessary component of upholding the HFC Allowance Allocation and Trading Program and the task force's deterrence work. It is also an important part of EPA's broader climate regulatory and enforcement work.

For more information on actions to address HFCs, visit: [Climate HFC Reduction](#)

### [The USEPA, 15 March 2022](#)

*Image: USEPA website*

**See also >>> [California Weighs New Bill to Support Natural Refrigerants and Require Lower GWPs for F-Gases](#)** - State Senator Skinner's SB 1206 would transition California's economy away from HFCs to natural alternatives no later than 2035.

## 9. NASRC Natural Refrigerant Technology Library

Natural refrigerants are simultaneously one of the leading climate solutions and the most effective way for food retailers to achieve compliance amidst growing state and federal regulatory pressures.

The North American Sustainable Refrigeration Council (NASRC) library includes free, on-demand presentations from [NASRC members](#) on the latest natural refrigerant technology offerings for food retail applications in the US.



### [The North American Sustainable Refrigeration Council \(NASRC\), March 2022](#)

*Image: NASRC website*

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# EUROPE & CENTRAL ASIA

## 10. Revision of Regulation (EC) 1005/2009 on substances depleting the ozone layer

This briefing is one in a series of 'implementation appraisals', produced by the European Parliamentary Research Service (EPRS), on the operation of existing EU legislation in practice.

Each briefing focuses on a specific EU law that is likely to be amended or reviewed, as envisaged in the European Commission's annual work programme. 'Implementation appraisals' aim at providing a succinct overview of publicly available material on the implementation, application, and effectiveness to date of specific EU law, drawing on input from EU institutions and bodies, as well as external organisations.

They are provided by the Ex-Post Evaluation Unit of EPRS, to assist parliamentary committees in their consideration of new European Commission proposals, once tabled.

### Summary

The depletion of the ozone layer affects both humans and the natural environment in a negative way. The process is provoked by chemicals known as 'ozone depleting substances', which are also potent greenhouse gases. These substances have been subject to legal regulation at international level for several decades. More specifically, they are addressed by the Vienna Convention and its Montreal Protocol, adopted in the second half of the 1980s under the auspices of the United Nations.

EU has spearheaded global efforts in the field of ozone depleting substances, adopting its first rules on these substances in the early 1980s and later addressing them specifically through Regulation (EC) 1005/2009.

The ex-post evaluation of the implementation of the regulation published at the end of 2019 shows that overall performance matches expectations and that the regulation is thus fit for purpose, despite there being room for improvement. The Commission is expected to issue a proposal to revise the regulation in the spring of 2022.

This implementation appraisal presents the findings of publicly accessible sources on the regulation's implementation.



Image: EPRS website

See also >>> [NGOs Call on EU to Decarbonize Home Heating and Cooling](#)

### 11. The Institute of Refrigeration (IOR) Women in RACHP Network hosts refrigerant training day

Event, held to coincide with International Women's Day, included 'hands-on' training sessions looking at the changing requirements for handling flammable refrigerant

The Institute of Refrigeration (IOR) has marked this year's International Women's Day on 8 March with a practical engineering event focused on handling alternative lower GWP refrigerant.



This week's event, hosted at the Business Edge training centre in Waterlooville, Hampshire, presented an overview about working with air-conditioning, heat pump and refrigeration systems in line with the changing requirements of F-Gas regulation.

This included a 'hands-on' training session with participants being invited to perform brazing work and safe handling of refrigerants with some level of flammability.

The event was open both to individuals already working in the industry, as well as people interested in a career in the refrigeration, air conditioning and heat pump systems sectors. Organisers had said that no prior technical knowledge was required to take part in order to build on the work of the IOR's Women in RACHP Network (WiRACHP).

Karen Perry, Chair of the network, said the group was working to increase contacts and communication across the industry and in building engineering to promote career opportunities for women in RACHP.

She said, "The more people we are able to talk to about the shortage of females and the need for greater diversity the more people recognise it and jump on board to help spread the word and create ideas to attract more women to the industry or support them within it."

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Mike Creamer, president of the IOR, stated that this week's event would pave the way for other similar training and information sessions to try and broaden the appeal of the sector to more people.

He added, "We were delighted to welcome so many participants to celebrate the IOR WiRACHP and International Women's Day."

"We have already decided to repeat the event next year."

The WiRACHP is open to women working across the RACHP sector in a range of positions that includes service and maintenance work, as well as those individuals working in design, research, engineering, sales, administration or marketing roles.

More details on the network's work and how to join [can be found here](#)

[The Institute of Refrigeration \(IOR\), 11 March 2022, By Neil Merrett](#)

Image: IOR website

## FEATURED



## OZONE SECRETARIAT

### Overview for the meetings of the ozone treaties in 2022

**68<sup>th</sup> IMPCOM**, Bangkok, Thailand | 09 July 2022

**44<sup>th</sup> OEWG**, Bangkok, Thailand | 11 - 16 July 2022

**5<sup>th</sup> ExMOP**, Bangkok, Thailand | 16 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.

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](#)

### **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](#)

### **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 >>>](#)

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

- [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.

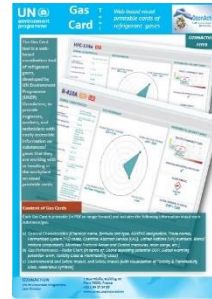
Click [HERE](#) to access the OzonAction Knowledge Maps tool

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 Card web-based tool**

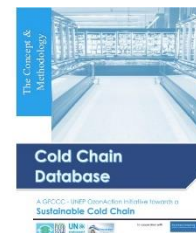
- The Gas Card tool is available online on the [OzonAction website](#)
- Read the full [2021 annual iPIC report](#)
- See the [flyer](#) introducing the new iPIC platform

*\* 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”. 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**



### [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

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## 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 Etlouny](#), OzonAction, UN Environment Programme



### [OzonAction's iPIC platform - Updated](#)

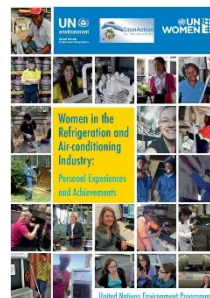
Collaboration between China and Thailand using OzonAction's informal Prior Informed Consent (iPIC) system has resulted in the prevention of a huge consignment of ozone-depleting and climate damaging hydrochlorofluoro-carbons (HCFCs).

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](#)

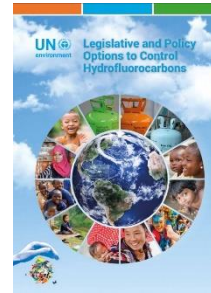


## PUBLICATIONS

### [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](#)



[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](#)

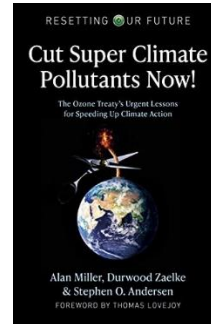


**Green Cooling in public procurement** How to advance the procurement of climate-friendly and energy-efficient cooling equipment in the public sector? Air conditioning in public buildings is often responsible for around 50% of total electricity consumption. Switching to climate-friendly cooling technologies ("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).

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**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.

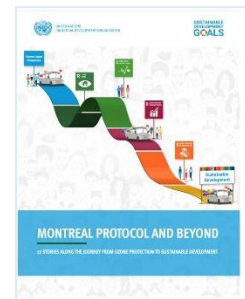
The e-book, titled "[7 Keys to a Compliant PSM Training Program for Ammonia Refrigeration](#)," outlines important questions a facility's program should address and questions that trained plant personnel should be able to answer. Topics covered include:

- 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?**

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

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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

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