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Volume XX | 30 April 2020

In this issue:

GLOBAL

UNEP's Statement on the COVID-19 global pandemic

We are pleased to share the **statement** of the United Nations Environment Programme on the COVID-19 global pandemic.

Furthermore, the presentation of the Executive Director on UNEP's engagement with the United Nations System and its response to the COVID-19 situation, provided during a briefing at the subcommittee meeting of the CPR, 2 April 2020, has also been made available at the following **link**

COVID-19 Pandemic updates from UNEP

1. Kigali Amendment latest ratification

Congratulations to the latest country which has ratified the Kigali Amendment:

North Macedonia, 12 March 2020

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

2. The UNEP OzonAction WhatGas? application has been updated and improved

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!

3. 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. This guideline was intended to support manufacturers, engineers, installers, contractors and users, and was also widely used by customs and enforcement officers and National Ozone Officers (NOOs) to help identify the contents of cylinders.

In recent years, the number of refrigerants has dramatically increased, particularly as chemical producers continue to develop numerous new refrigerant mixtures for various applications. This fast-rising number of refrigerants created some concern since as more and more colours were used, the potential for misidentification of cylinders of similar colours increased. It was therefore decided by AHRI that for the benefit of the industry the guideline should be updated. This was to ensure continuation of correct identification and safe use of refrigerants based on clear and distinct product markings and labels. The revised guideline, first published in 2015, removes paint colour assignments for refrigerant containers and specifies that all refrigerant containers should have the same paint colour from 2020 onwards. This colour is a light green/grey, called “silk grey” (RAL 7044[4]). This guideline also provides a means by which colours can be assigned to printed materials, such as printed labels on refrigerant containers; these colours generally follow the familiar AHRI colours previously used for refrigerants.

It is very important that the range of stakeholders in the refrigeration and air-conditioning industry as well as NOOs and customs and enforcement personnel are aware of this change. **Cylinder colours can no longer be relied on as a means to identify the type of refrigerant in a container**. The principal method of cylinder identification now needs to be the container labels and markings. It is important to note that **flammable refrigerants** should include a red band on the top of the cylinder.

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. It will be important to inform and train customs officers of this change as colour codes have always been a helpful way to identify refrigerants. Given the possibility of mis-labelled or counterfeit refrigerants in cases of doubt/suspicion, it is recommended to verify the type of refrigerant using a refrigerant identifier

For more information read/download the factsheet

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4. 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 (April 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
- **W. Stephen Comstock**, Manager of Business Development EMEA, ASHRAE

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5. Provisional agenda of the 85th meeting of the Executive Committee


UNITED NATIONS

EP

United Nations Environment Programme

The Eighty-fifth Meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, has been postponed due to the coronavirus disease (COVID-19).

The 85th meeting has been postponed until immediately after the 42nd meeting of the Open-ended Working Group (OEWG), and will be held in Montreal for a duration of four days, from 19 to 22 July 2020, on the understanding that the meeting might be further postponed or cancelled in light of the evolution of the COVID-19 pandemic.

Provisional Agenda

The Multilateral Fund for the Implementation of the Montreal Protocol, April 2020

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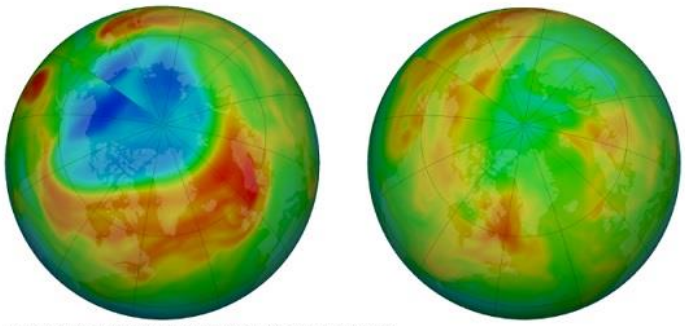
6. Arctic ozone hole closes

New data suggests that the record ozone hole discovered over the Arctic in March is now closed. Despite the unprecedented size causing alarm, scientists were quick to dispel the assumption that this must be due to a spike in ozone-depleting substances. They attributed it to the unusual wind conditions – or an unusually strong and persistent polar vortex – which trapped extremely cold air over the North Pole ozone levels to dramatically drop.

Polar vortexes always exist but typically weaken during the summer and strengthen again in the winter. The polar vortex in the Arctic tends to be weaker than in the Antarctic due to nearby land and mountains that disrupt the wind patterns. In extreme low temperatures, cold air trapped in a polar vortex leads to the formation of high-altitude clouds which catalyze ozone destroying reactions.



Arctic stratospheric ozone reached its record low level of 205 Dobson units, shown in blue and turquoise, on March 12, 2020 (pictured left) compared to the recovered ozone as of 26 April (pictured right)

Credits: NASA's Goddard Space Flight Center

As referenced in our earlier feature on the **Unusual conditions over the Arctic**, this year's Arctic ozone depletion was the exception, as extraordinary atmospheric conditions allowed the concentration of cold air in the North Pole for much longer than is typical. As expected by scientists, with the change of seasons and the move towards the summer, the strength of the polar vortex has dissipated, allowing ozone-rich air from the mid-latitudes to flow into the Arctic. This has put an end to the region's depleted ozone levels resulting in the closure of the Arctic ozone hole.

The same cannot be said about ozone levels over the Antarctic. This is the ozone hole we are more familiar with that was first discovered by scientists in the early 1980s. The enormity of this prompted the world to adopt the Montreal Protocol in 1987, under which, the phasing out of ozone-depleting substances is helping the ozone hole over the Antarctic to heal. While the ozone depletion over the Arctic was swift to revert, ozone over the Antarctic is not expected to return to pre-1980s levels until around the 2060s.

The United Nations Environment Programme, Ozone Secretariat, 29 April 2020

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7. Latest options for replacing HFC-134a refrigerant in MACs

With the passage of the Kigali Amendment to the Montreal Protocol, HFC-134a refrigerant will be phased down in all markets worldwide, including those where automotive companies have been slow to embrace HFO-1234yf.

Engineers are currently being challenged to design MAC systems using alternate low GWP refrigerants that are allowed by regulations, and are simultaneously cost-effective to manufacture, energy efficient, safe, reliable, affordable for consumers, and also suitable in electrified vehicles.

2020-01-1254 Published 14 Apr 2020

SAE INTERNATIONAL

Latest Options for Replacing HFC-134a Refrigerant in MACs

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Abstract

With the passage of the Kigali Amendment to the Montreal Protocol, HFC-134a refrigerant will be phased down in all markets worldwide, including those where automotive companies have been slow to embrace HFO-1234yf. Engineers are currently being challenged to design MAC systems using alternate low GWP refrigerants that are allowed by regulations, and are simultaneously cost-effective to manufacture, energy efficient, safe, reliable, affordable for consumers, and also suitable in electrified vehicles. This paper documents the latest international research and developments on: 1) refrigerants that satisfy the Montreal Protocol and national environmental regulations; 2) secondary loop MAC (SL-MAC) that achieve lower refrigerant emissions and higher energy efficiency in cooling-only and cooling and heating (heat pump) applications; 3) progress in Europe, North America, and Asia on heat pump systems for electric and hybrid vehicles optimized for safety and energy efficiency, and 4) the latest SAE standards for the emerging use of HFC-152a in SL-MACs. The authors of this paper are an interdisciplinary team from organizations based in China, Germany, India, Italy, and the United States, including experts from vehicle manufacturing, AC component and system suppliers, and non-government environmental organizations.

Introduction

At least every new passenger vehicle sold in developed countries and most sold in developing countries worldwide include air conditioning (AC) for comfort, for safety by maintaining driver alertness, and for keeping windows clear of condensation. Motor vehicle air conditioning (MAC) consumes 5-20% of motor fuel or electricity depending on climate, vehicle type, driving patterns, and traffic congestion, and the International Energy Agency predicts that "energy use from mobile air conditioning may almost triple to over 5.7 million barrels of oil equivalent per day by 2050." [20] MAC refrigerant greenhouse gas emissions account for about thirty percent of hydrofluorocarbon (HFC) emissions on a global warming potential (GWP)-weighted basis.[20], [21] A further predicts that absent significant changes in mobile air conditioning, "annual combined emissions from energy consumption and refrigerant leakage could more than triple to 1,300 million tons of CO_2-equivalent" by 2050. [20] In recent years, scientists observed that HFCs were the fastest growing greenhouse gases in much of the world, increasing

This paper documents the latest international research and developments on:

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3) progress in Europe, North America, and Asia on heat pump systems for electric and hybrid vehicles optimized for safety and energy efficiency, and
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The authors of this paper are an interdisciplinary team from organizations based in China, Germany, India, Italy, and the United States, including experts from vehicle manufacturing, AC component and system suppliers, and non-government environmental organizations.

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SAE International, 14 April 2020

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8. UNEP OzonAction Encourages Everyone to Celebrate World Refrigeration Day 2020

World Refrigeration Day (WRD) is an international commemorative day that raises awareness about the refrigeration and air-conditioning industry and its contribution to modern life, as well as its connection to key societal objectives including mitigating climate change, protecting the ozone layer, and achieving the sustainable development goals (SDGs). Inaugurated in 2019, the initiative is well recognized and supported by leading industry associations and organizations around the globe, as well as governments and non-governmental organisations.

WRD is organized each year on 26 June, the birth date of Lord Kelvin after whom the Absolute temperature scale (the “Kelvin Scale”) is named. UNEP OzonAction was one of the early supporters of this commemorative day and joined the WRD Secretariat and ASHRAE to celebrate the first edition of this awareness-raising event.

This year, UNEP OzonAction, the **WRD Secretariat**, **ASHRAE**, the **European Partnership for Energy and Environment** (EPEE), and the **International Institute of Refrigeration** (IIR) are partnering to promote a global campaign centered around the theme of the Cold Chain. This topic has generated great interest in recent years given its multi-dimensional contribution to key issues including Food Safety/Food Security, Health, Climate Change/Ozone Protection, Sustainable Production/Consumption, and others.

The Food Cold Chain can best be defined as the series of actions and equipment applied to maintain a product within a specified low temperature range from harvest/production to consumption, including farming/fishing, food processing, cold storage, transportation, food services, and domestic uses.

The 2020 campaign, which is being organized under the slogan “Cold Chain 4 Life”, aims at building knowledge and raising awareness amongst three different groups:

- General Public: consumers and direct beneficiaries of services/products offered through the cold chain.
- Policymakers: governments and authorities responsible for drafting and implementing relevant strategies and regulations.
- Owners/Operators: decision makers in terms of technology selection and operational procedures of different technologies required for cold chain processes.

“World Refrigeration Day is a great opportunity for all of us to celebrate the tremendous contribution that refrigeration and air conditioning makes to our societies. This includes enabling our agricultural and food systems to harvest, store, transport and sell the foods that nourish us all. The food cold chain is what makes this possible," said James Curlin, Acting Head of UNEP OzonAction, *"We encourage everyone to organize your own national or local WRD celebrations on 26 June to shine light on great work of the refrigeration and air conditioning sector, which is so vital for the success of the **Montreal Protocol.**”*

National Ozone Units, national associations and industry groups, companies and professionals working in the refrigeration and air conditioning sector, schools and

individuals can all join in the activities.

You are all invited to join the “Cold Chain 4 Life” campaign by organizing relevant events/functions or using the resources which the campaign will offer soon. Please follow-us on the OzonAction web site and through the WRD web site and associated social media tools.

Cold Chain 4 Life is an international campaign organized by the WRD Secretariat, UNEP OzonAction, ASHRAE, IIR and EPEE to help governments, organizations, companies and media promote World Refrigeration Day 2020. The Web-Ads (banners) available through below links may be used free of charge in websites and other media providing the they are not altered; logos and other branding are not added; that the they are not used in ways which state or imply endorsement of a brand, product or service by the WRD Secretariat or the campaign's organizers.

The United Nations Environment Programme, OzonAction, April 2020

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9. ASHRAE issues statements on relationship between COVID-19 and HVAC in buildings

Expanded Guidance Available on ASHRAE’s Newly Updated COVID-19 Resources Webpage

ATLANTA (April 20, 2020) – ASHRAE has published two statements to define guidance on managing the spread of *SARS-CoV-2*, the virus that causes COVID-19 disease (Coronavirus) with respect to the operation and maintenance of heating, ventilating and air-conditioning systems in buildings.

“In light of the current global pandemic, it’s critically important that ASHRAE responds with guidance on mitigating the transmission of the virus, as well as ventilation and filtration recommendations,” said 2019-20 ASHRAE President Darryl K. Boyce, P.Eng. “ASHRAE has a significant role to play in ensuring safe and healthy building environments and these statements offer the expert strategies needed at this time.”

ASHRAE developed the following statements in response to widening false statements surrounding HVAC systems. ASHRAE officially opposes the advice not to run residential or commercial HVAC systems and asserts that keeping air conditioners on during this time can help control the spread of the virus. The official statements are below.

ASHRAE’s statement on airborne transmission of SARS-CoV-2/COVID-19

Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning systems, can reduce airborne exposures.

ASHRAE’s statement on operation of heating, ventilating, and air-conditioning systems to reduce SARS-CoV-2/COVID-19 transmission

Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air. Unconditioned spaces can cause thermal stress to people that may be

directly life threatening and that may also lower resistance to infection. In general, disabling of heating, ventilating, and air-conditioning systems is not a recommended measure to reduce the transmission of the virus.

HVAC filters, along with other strategies, help to reduce virus transmission while removing other air contaminants that may have health effects.

ASHRAE's Environmental Health Committee also developed an **Emerging Issues Brief** to support the two above statements:

There is great concern about the real possibility of transmission through the air of various pathogens, especially SARS-CoV-2, among staff and administration in healthcare facilities, office workers, retail workers and patrons, manufacturing workers, and residents in private and public facilities and the general public in outdoor settings and in public transportation.

ASHRAE has created the **Epidemic Task Force**, comprised of leading experts to address the relationship between the spread of disease and HVAC in buildings during of the current pandemic and future epidemics. The ASHRAE Environmental Health Committee's Position Document Committee also updated a **Position Document on Infectious Aerosols**.

"ASHRAE, working with its industry partners, is uniquely qualified to provide guidance on the design, operation, and maintenance of heating, ventilation, and air-conditioning systems to the COVID-19 pandemic as well as to prepare for future epidemics," said ASHRAE Epidemic Task Force chair, ASHRAE Environmental Health Committee voting member and 2013-14 ASHRAE Presidential Member Bill Bahnfleth.

Visit the newly updated ASHRAE's COVID-19 Resources webpage at **ashrae.org/COVID19** for additional details. The page includes **frequently asked questions** and the latest information on the ETF's guidance for healthcare facilities, residential buildings and other issues related to the COVID-19 pandemic.

ASHRAE, April 2020

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10. The story of CO_2 as a refrigerant

Petter Nekså, Chief Scientist, SINTEF Energy Research (Right) and Michael Bantle, Senior Research Scientist (Left).

Carbon Dioxide is so often cast as the villain in climate change debates. Yet that very same substance along with other natural working fluids has the potential to cut more emissions than any other climate change mitigation technology. Now HighEFF is poised to build on years of Norwegian research and push the technology through to commercialisation in new areas.

For thousands of years, we have worked to first understand, then manage our relationship with temperature. When it is too hot, we need to keep food and ourselves cool. When it is too cold, we need to heat our homes. Closed-circuit circulation technologies like refrigeration, air conditioning systems and heat pumps solved that problem, but they require working fluids to extract heat from one source and

transfer it to another.

The CFC and HFC problem

A group of odourless manufactured chemicals, chlorofluorocarbons (CFCs) were widely used in aerosols, refrigerators, air conditioners and more until they were banned by the Montreal Protocol – which entered into force in January 1989 – because of their impact on the ozone layer. Their replacement – hydrofluorocarbons (HFCs) – have no ozone depletion potential, but it has since been discovered that they are very potent greenhouse gases.

In January 2019, the Kigali Amendment to the Montreal Protocol entered into force, which will phase down the use of HFCs. A switch to ozone- and climate-friendly alternatives will avoid an increase of more than half-a-degree in global temperature by the end of the century. What are those alternatives? Step forward Norwegian research.

Researching an old solution to a new problem

The discovery of the harmful nature of CFCs triggered a period of significant work at NTNU and SINTEF on natural working fluids (NWF) as an alternative. While HFCs became a commercial success in many applications, the research into NWFs as a climate-friendly solution continued. Retired NTH Professor Emeritus Gustav Lorentzen was the figurehead behind the research, first proposing CO_2 as a refrigerant in 1987. Through his leadership, Norwegian research began to collaborate closely with Norsk Hydro who had a strong interest in alternative refrigeration systems for their aluminium products, such as heat exchangers and lines. That collaboration led to the formation of shecco, a group that spearheaded the drive for CO_2-based solutions for many years.

The first refrigeration system using CO_2 actually dates back to 1879. The system was popular in military and shipping due to its non-toxicity and inflammable properties. But technical issues and heavy promotion of CFCs by the chemical industry saw CO_2 disappear from the market by the 1940s. [...]

SINTEF news, 20 April 2020

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11. Renewed and emerging concerns over the production and emission of ozone-depleting substances

Abstract

Stratospheric ozone depletion, first observed in the 1980s, has been caused by the increased production and use of substances such as chlorofluorocarbons (CFCs), halons and other chlorine-containing and bromine-containing compounds, collectively termed ozone-depleting substances (ODSs).

Following controls on the production of major, long-lived ODSs by the Montreal Protocol, the ozone layer is now showing initial signs of recovery and is anticipated to return to pre-

depletion levels in the mid-to-late twenty-first century, likely 2050–2060.

These return dates assume widespread compliance with the Montreal Protocol and, thereby, continued reductions in ODS emissions. However, recent observations reveal increasing emissions of some controlled (for example, CFC-11, as in eastern China) and uncontrolled substances (for example, very short-lived substances (VSLSs)). Indeed, the emissions of a number of uncontrolled VSLSs are adding significant amounts of ozone-depleting chlorine to the atmosphere. In this Review, we discuss recent emissions of both long-lived ODSs and halogenated VSLSs, and how these might lead to a delay in ozone recovery.

Continued improvements in observational tools and modelling approaches are needed to assess these emerging challenges to a timely recovery of the ozone layer.

Key points

- Ozone recovery is expected mid-century, owing to adherence to the Montreal Protocol, but a number of recent trends could challenge its timely recovery.
- The apparent illicit production of CFC-11 is one such challenge to ozone recovery, but the added damage to the ozone layer in this case depends on how rapidly the CFC-11 emissions are mitigated.
- A number of industrial processes that are allowed by the Montreal Protocol contribute considerable amounts of chlorinated gas emissions to the atmosphere.
- Increases in ozone-depleting chlorine from a number of human-produced, short-lived gases have led to some increased ozone depletion, although their future impacts on ozone depend on future uses.
- Natural processes also affect the balance of ozone in the stratosphere in a number of ways and could change in the future as climate responds to increases in atmospheric greenhouse gas concentrations.

Authors: Martyn P. Chipperfield, Ryan Hossaini, Stephen A. Montzka, Stefan Reimann, David Sherry & Susann Tegtmeier

Nature Reviews Earth & Environment, 30 April 2020

ASIA PACIFIC

12. Fiji build partnership to fight climate change and protect ozone layer

Fiji Department of Environment has initiated projects to work towards the protection of the ozone layer through the Montreal Protocol and introducing

low global warming potential gases in the market.

In marking the 50th anniversary of World Earth Day with the theme “Climate Action”, Minister for Environment Hon. Dr. Mahendra Reddy stressed that “the fight for a clean and healthy environment continues with increasing urgency, as the ravages of climate change become more and more apparent day by day”.

“We all have to play our part – big or small every action counts. We celebrate Earth Day with immense gratitude to all those who have worked so hard to protect our planet and may well join hands and be part of the fight towards climate change.”

Minister Reddy also witnessed the retrofitting of the existing R-22 gas to R-407C on an air conditioning equipment at Nila Resort in Vuda, Lautoka.

This is the first transition for the air-conditioning and tourism sub-sector which is environmentally friendly and does not deplete the ozone layer.

Fiji TV, 23 April 2020

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13. Beijing 2022 highlight refrigeration systems among key sustainability initiatives

Beijing 2022 have published a video highlighting how their refrigeration systems are aiding sustainability initiatives to mark Earth Day.

Earth Day, which is held on April 22 each year, is aimed at demonstrating support for environmental protection.

Beijing 2022 have vowed to host a green Winter Olympics in two years’ time. Organisers announced last year that all venues for Beijing 2022 would be powered by green electricity, following the signing of an agreement between the Organising Committee and the State Grid Corporation of China.

According to the International Olympic Committee, the clean energy programme will make Beijing 2022 the first Olympic event in history to power all its venues with green and renewable energies produced from clean sources.

The Beijing 2022 Earth Day video highlights how ice venues will be equipped with natural CO_2 refrigeration systems, which they claim will minimise the overall carbon footprint of the Games.

The cooling system, which it is claimed has no impact on the environment, will be used at the speed skating, figure skating and short track venues, as well as the ice hockey training centres.

A low global warming potential refrigerant will also be installed at the ice hockey and

curling venues.

The implementation of the system will mark the first time the technology is used in China and at the Olympics.

“Most refrigerants on the market contribute to the greenhouse effect and are detrimental to the ozone layer,” said Zhang Xinrong, chairman of Beijing Energy Society.

“Carbon dioxide on the other hand is a natural and green refrigerant that is friendly to the environment.

“We have done a lot of work in theoretical analysis, digital simulation and experimental verification.

“Liquid carbon dioxide absorbs the heat as it evaporates, making refrigeration and ice making possible.

“When it releases heat, we can recycle the heat and use it once again for heating supply, dehumidification de-icing and other energy demands”. It is claimed the process could lead to around a 60 per cent energy saving.

“Using carbon dioxide as a refrigerant for our ice rinks is sending a strong signal that China is committed to protecting planet earth, our shared home,” said Liu Yumin, director general of venue planning and construction department of Beijing 2022.

“We are doing our part in the endeavour.”

Inside the games, 24 April 2020, By: Michael Pavitt

NORTH AMERICA

14. Protection of Stratospheric Ozone: Revisions to the Refrigerant Management Program's Extension to Substitutes

SUMMARY

The Clean Air Act prohibits knowingly venting or releasing ozone-depleting and substitute refrigerants in the course of maintaining, servicing, repairing, or disposing of appliances or industrial process refrigeration.

In 2016, the EPA amended the regulatory refrigerant management requirements and extended requirements that previously applied only to refrigerants containing an ozone-depleting substance to substitute refrigerants that are subject to the venting prohibition (*i.e.,* those that have not been exempted from that prohibition) such as hydrofluorocarbons.

Based on changes to the legal interpretation that supported that 2016 rule, this action revises some of those requirements—specifically, the appliance maintenance and leak repair provisions—so they apply only to equipment using refrigerant containing an ozone-depleting substance.

This final rule is effective on April 10, 2020.

The United States Federal Register, April 2020

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15. CFC/HCFC/HFC Certification Course via CARS OnDemand

"Canada's Ozone Layer Protection Awareness Program" CARS OnDemand Training June 3/10 or June 4/11, 2020

Registrations are due by May 15, 2020

As a result of increased participant demand during COVID-19, CARS OnDemand will host additional CFC/HCFC/HFC Certification training online in June 2020.

Recently, the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) in conjunction with Environment Canada, has updated the "CFC/HCFC/HFC Control in the Refrigeration and Air Conditioning Industry" Training Program. The Code of Practice which the course is based on has been revised, resulting in this updated course.

The new CARS OnDemand course, titled "**Canada's Ozone Layer Protection Awareness Program**", still provides the same certification required to purchase and handle refrigerants across Canada, frequently knows as ODS (Ozone Depletion Substances) or ODP (Ozone Depletion Prevention) certificates.

CARS presents this newly updated **"Canada's Ozone Layer Protection Awareness Program**" training via CARS OnDemand. We will be hosting two groups of this two-part course; June 3/10 at 12pm Eastern or June 4/11 at 5pm Eastern. CARS OnDemand subscribers have the ability to register for this live broadcast training series.

This certification course delivered via CARS OnDemand is hosted by a live instructor at scheduled sessions, allowing participants to phone in with questions during the broadcast. Students receive training over two modules of lessons to write the government's certification exams directly after the second module.

Participating in Certification Training via CARS OnDemand allows you to take the training in your own shop, without the need to travel to a traditional classroom setting.
Group 1:
Wednesday, June 3, 2020 – 12pm to 3:30pm (Lesson 1)
Wednesday, June 10, 2020 – 12pm to 3:30pm (Lesson 2)

Group 2:
Thursday, June 4, 2020 – 5pm to 8:30pm (Lesson 1)

Thursday, June 11, 2020 – 5pm to 8:30pm (Lesson 2)

Students must attend both modules in either group. Times listed are Eastern. CARS OnDemand students must pre-register for this special course!

Please note: Due to concerns regarding COVID, we realize that some participants who registered for the March/April 2020 session were unable to attend. CARS will be in contact directly with these participants to confirm their status for this session; there is no need to "re-register" for this session if you paid for but missed the March/April 2020 program.

To Register: contact CARS toll-free at **1-855-813-2101** to register by telephone
OR **Download and return the Registration Form (Adobe PDF format).**

CARS OnDemand, Indie Garage, 22 April 2020, By: Andrew Ross

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16. Prepare for the trend of flammable refrigerants in commercial refrigeration - Webinar

New refrigerant legislation has led to a transition to hydrocarbons as a long-term solution for plugin refrigeration systems. For many years, Embraco has been investing in the development of hermetic compressors and cooling solutions for use with natural refrigerants and partnered with OEMs from all continents. Contractors and technicians should expect to see isobutane (R600a) and propane (R290) compressors in the aftermarket with increasing frequency.

Learning Objectives:

1. Comprehend the newest updates on legislation for commercial refrigeration and recognize industry trends.
2. Assess flammable refrigerant characteristics and the benefits of the use of natural refrigerants in commercial refrigeration.
3. Identify and recognize the main changes on compressor and system design for refrigeration systems operating with flammable refrigerants.
4. Learn best practices and updated safety tips for working on equipment with flammable refrigerants.

Date: 7 May 2020, **Time**: 2 PM EDT

Register Now

EUROPE & CENTRAL ASIA

17. Interview with Tatjana Boljević - National Ozone Officer of the National Ozone Unit in Montenegro on her experiences with the enabling activities and the ratification of the Kigali Amendment

What advice would you give to other countries that are still in the process of implementing activities?

I would tell them that it is very important to include as many national stakeholders as possible within the Enabling Activities (EA) project and explain that by ratifying the Kigali Amendment everyone can benefit. My main advice to other countries is: “Be persistent in your path towards the ratification of the Kigali amendment”.

Which of the project activities do you feel provided the biggest impact?

One of the project activities focused on capacity building and strengthening cooperation. The project provided an opportunity to develop and strengthen communication with different government and non-government institutions and stakeholders. Institutions such as government ministries (responsible for the environment, trade, economy, energy efficiency, etc.), environmental inspections, customs, standardization bodies and other relevant stakeholders such as the RAC industry play a crucial role in the implementation of the Kigali Amendment. Furthermore, they will be crucial in the process of preparing

and implementing the HFC phase-down strategy. In this sense, the project provided a solid foundation and strong partnerships to enable future work in this area.

What were the main challenges you faced in implementing the Enabling Activities project in Montenegro?

The activities under EA projects can differ from country to country but in the end they all share the same goal – the ratification of the Kigali Amendment. In this regard, the main challenge could be the process of ratification. Fortunately, in Montenegro there weren't any problems in ratifying. Through the further ratification of the Kigali Amendment, Montenegro reconfirmed its readiness to take further steps towards the protection of the ozone layer and the preventing the negative impacts of climate change. The Enabling Activities project started on 1 January 2018 and within the same year, the Parliament of Montenegro, adopted the Kigali Amendment at a session held on 28 December 2018. On 25 April 2019, Montenegro officially became the 70th country in the world to ratify the Kigali Amendment.

What would you say are the benefits of partnering with UNIDO?

The full implementation of the Montreal Protocol in Montenegro started in 2007 after the approval of the Country Programme (CP) and terminal phase-out management plan (TPMP). This was one year after Montenegro proclaimed its independence. Since 2007, in cooperation and with the support of UNIDO, Montenegro successfully implemented all Montreal Protocol activities and fulfilled all protocol provision requirements. During the implementation period, UNIDO provided support in all aspects of the project, and cooperation and communication took place with mutual understanding.

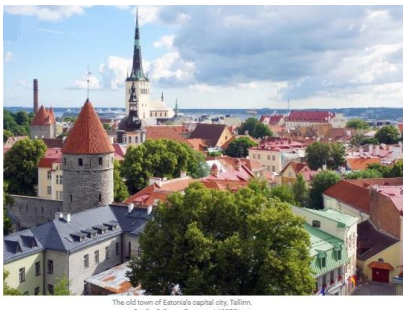
How will you continue to build on the momentum of the Enabling Activities project?

At the end of 2019, Montenegro introduced the important Law for Protection against the Adverse Impacts of Climate Change which provided a basis for the introduction of a quota system for HFCs. The quota system for HFC imports will be established through the adoption of by-laws and ozone protection issues will be further elaborated. This will contribute to the better implementation of Montreal Protocol provisions in further compliance with EU regulations.

Amid the current Covid-19 outbreak, how are you adapting to working from home and what advise would you give to others?

Due to the current COVID 19 outbreak and recognition of the importance of health, all meetings are postponed until further notice. The Nature and Environmental Protection Agency, as many institutions in the country, has taken certain steps in line with the current situation, but still remains accessible to all interested parties. Although most of my colleagues and I work from home, our experience and practice give us the ability to handle ongoing activities, taking care that no one is denied of answers, permits, etc.

18. Estonia Builds Training Facility for NatRefs



The old town of Estonia's capital city, Tallinn.
Credit: © Suean Peterson/ 123RF.com

The country's Environmental Research Centre is leading a transition to climate-friendly refrigerants in spite of cheap HFC imports from Russia.

Despite facing some significant challenges, Estonia, led by the Ministry of Environment and the Estonian Environmental Research Centre, has embarked on a major effort to transition to natural refrigerants and low-GWP gases, including a new training facility.

The journey started in 2014 after the EU adopted the F-Gas Regulation. The Estonian government originally put its faith in the market to adopt phase-down measures, said Stanislav Stokov, Specialist in the Environmental Research Centre's Climate Department. [...]

Estonia is still only at the very beginning of its transition. Currently the country has around 20 CO_2 installations; a mix of subcritical and transcritical systems; two or three companies with industrial ammonia installations; and a small number of retailers using hydrocarbon units, according to Stokov. Still, there are signs of progress. Since 2016, Estonia's f-gas emissions have decreased by 2.4%.

NEW TRAINING FACILITY

In preparing for the transition project, members of the Estonian Environmental Research Centre (including Stokov), the Ministry of Environment and the national refrigeration association went on a trip to Denmark to acquire knowledge and inspiration from the Danish Technological Institute on potential legislation, characteristics of each natural refrigerant, and how to best disseminate what they learned.

One of the project's major initiatives is a new training facility for refrigeration technicians. The facility is meant to address the lack of qualified natural refrigerant technicians, and thus make it easier for the companies to switch from HFCs. The training facility should be fully up and running in April. It contains CO_2 transcritical, CO_2 subcritical, hydrocarbon and HFO systems.

That ammonia isn't included in this list is entirely due to cost. "We wanted an ammonia unit, but it's so expensive, it would have been much more than the project itself," Stokov said. "Currently, we are looking into cooperation with some companies who have experience [with ammonia] and have sites, where they [student technicians] can come and do some practical stuff."

The project has also focused on textbooks and other literature for trainees. Most technicians and trainees in Estonia don't speak English, and currently only one book about refrigerants exists in Estonian, and that doesn't include natural refrigerants.

So the project is in the process of translating a Norwegian book about flammable refrigerants, and a U.S. manual about refrigerants in mobile air conditioning (MAC). The project is also in the process of rewriting the country's certification requirements, as it

hasn't been possible to certify in natural refrigerants until now. Stokov expects the new certification to be ready in April or May.

Because it wasn't previously possible to get certified to work with natural refrigerants in Estonia, some of the early adopters of sustainable technologies sent their staff to Germany for training.

Some of these early adopters include retailers owned by foreign companies, such as a Swedish company that has implemented the same environmental policies in its Estonian operations as the ones used at home in Sweden, Stokov said.

The final aspect of the transition project is to ensure efficient recycling of used refrigerants. The project has invested in a couple of HFC recycling machines and offers these to the companies so they can clean up used refrigerants like R404A and R134a.

Accelerate Magazine // April-May 2020, pages 46-47, By: Tine Stausholm

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19. Customs seize one container containing air conditioners – Malta

One container labelled as holding generators actually held air conditioners.

Customs officers intercepted containers with falsely declared television sets and air conditioning units as well as almost 4,000 cigarettes on a cargo ship.

In a statement, the department said the first case saw officers finding 1,627 television sets in two containers which were meant to contain monitors while another container, which was meant to contain generators, was instead carrying 359 air conditioning units.

All three containers, which were intended for the domestic market, were withheld for further investigations.

Times of Malta, 20 April 2020

5th Edition of Europe and Central Asia (ECA) Montreal Protocol Award for Customs and Enforcement Officers for 2019-2020

The United Nations Environment Programme, OzonAction, in cooperation with the World Customs Organization and the Ozone Secretariat, has launched the fifth edition of the ECA Montreal Protocol Award for Customs and Enforcement Officers for the period 2019-2020. Nominations forms are available in English and Russian and the award

ceremony is scheduled for 2021. The award is part of the work programme of OzonAction's Regional Montreal Protocol Network for Europe and Central Asia (ECA network).

The award recognizes the crucial role of customs & enforcement officers in implementing trade restrictions and bans for hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs). Both groups of chemicals, which are controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer, are widely used as refrigerants and foam blowing agents in the refrigeration, air conditioning and foam blowing sectors.

The informal Prior Informed Consent (iPIC) system allows trade partners to confirm the legitimacy of an intended trade in controlled substances prior to issuing import / export licenses. More information on iPIC is available **here**

The award aims to recognize and offer encouragement to customs and enforcement officers and their respective organizations for successful prevention of illegal or unwanted trade in HCFCs / HFCs. This also includes equipment or products containing or relying on the use of HCFCs / HFCs.

Eligible nominees include customs and enforcement officers and / or their respective organizations who have been directly involved or instrumental in preventing illegal or unwanted trade in HCFCs / HFCs as well as equipment or products containing or relying on the use of HCFCs / HFCs.

Eligible enforcement actions include the detection of an illegal shipment and the subsequent seizure, detention or sending back of the disallowed goods, as well as successful iPIC consultation preventing the issuance of export / import licenses for illegal or unwanted shipments.

Enforcement actions are eligible if they have not been submitted to any other award schemes.

Geographical scope and time period

Eligible countries include those in the Europe and Central Asia (ECA) region including countries with economies in transition (CEIT countries) and Western European countries as well as their trading partners.

Eligible enforcement actions must have taken place during the period: 1 January 2019 – 31 December 2020.

Completed nomination forms with detailed and comprehensive case descriptions and supporting photos and documents should be received by the United Nations Environment Programme as soon as possible but **at the latest by 31 January 2021**.

Learn more >>>

FEATURED

OZONE SECRETARIAT

Click **here** for Montreal Protocol upcoming Meetings Dates and Venue.

Recent Meetings:

- **31st Meeting of the Parties to the Montreal Protocol,**
  4 - 8 November 2019, Rome, Italy
- **Bureau Meeting of the 30th Meeting of the Parties to the Montreal Protocol,**
  3 November 2019, Rome, Italy
- **63rd Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol,**, 2 November 2019, Rome, Italy

Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Status of Ratification 15 October 2016 to **date**

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.

THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

Click **here** for the Executive Committee upcoming and past Meetings.

Recent meetings:

- **84th meeting of the Executive Committee**
- **83rd meeting of the Executive Committee**
- **82nd meeting of the Executive Committee**
- **Executive Committee Primer – 2019** - An introduction to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol

OZONACTION

COVID-19 pandemic: Letter from James S. Curlin, Acting Head, OzonAction, to the National Ozone Officers - On behalf of the United Nations Environment Programme (UNEP) OzonAction, I would like to express our deep appreciation to your country for its continued high-level commitment to implement the Montreal Protocol on Substances that Deplete the Ozone Layer, including during very challenging times such as what the world is now facing with the COVID-19 pandemic. I would like to re-assure you that during this very difficult period, OzonAction's Compliance Assistance Programme (CAP) – like the rest of UNEP – remains open for business. Our CAP teams in Bangkok, Manama, Nairobi, Panama City, and Paris continue to work with great dedication and diligence to support Article 5 countries with meeting their compliance, reporting and project-related needs. Our internal processes are all functioning well, including those related to finance and administration. Our CAP teams continue to provide technical and policy support. Our information clearinghouse, capacity building services, and refrigeration and air conditioning partnerships are still developing and distributing tools and information to support your work. [...] **Read/download**

OzonAction's iPIC system helps prevent an illegal shipment of 72 tonnes of HCFC-22
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.

Servicing tail for HCFCs: What is it & why does it matter?
This concept of a servicing tail, while allowed under the Montreal Protocol might not always be consistent with the phase-out targets specified under the HCFC Phase out Management Plan (HPMP) funding agreements agreed by Article 5 countries with the Executive Committee when receiving funds for HCFC phase out, where countries are obliged to meet these targets as specified in the agreement.

Details and explanations are provided in this **Policy Brief**.

Contact: **Ezra Clark**, UNEP, OzonAction

The OzonAction new iPIC platform - The Informal Prior informed consent system (iPIC) has been completely overhauled and updated - *OzonAction latest updated and streamlined version of the online Informal Prior-Informed Consent (iPIC) platform. Responding to comments and feedback we have changed how the system looks and operates.* **See the iPIC flyer for more details - Visit iPIC website to familiarise yourselves with the new features and functionalities.** *Automatically re-set your password if required.*

Contact: iPIC Online Administrators for any further questions.

OzonAction Factsheet: Proposed additional HS code sub-headings for HFCs in advance of the 2022 HS code update - 'Cheat Sheet'

This document is intended to accompany the OzonAction policy brief: "***HS CODES FOR HFCs - Advice for countries in advance of the 2022 HS code update***", available **here**.

Download the Factsheet

Contact: **Ezra Clark**, UNEP, OzonAction

OzonAction Factsheet: Dealing with seized ODS - Options for Article 5 countries

This concise factsheet summarises the five main options available to countries when dealing with seized ODS or HFCs as well as outlining the various considerations and the pros and cons of these options.

Download the Factsheet

Contact: **Ezra Clark**, UNEP, OzonAction

UNEP OzonAction Training Programme for National Ozone Officer


UN ENVIRONMENT OZONACTION
Training Programme for National Ozone Officers
Comprehensive modular training programme for new National Ozone Officers (NOOs), assistants and other staff of National Ozone Units

A key factor contributing to the significant success of the Montreal Protocol on Substances that Deplete the Ozone Layer is the 'country-driven approach'. This approach places National Ozone Units at the centre of the action to protect the ozone layer.

The National Ozone Unit led by the National Ozone Officer (NOO), is the single most important element in national strategies to comply with the Montreal Protocol.

The knowledge and capacity of the NOO in effectively developing projects, managing strategies, reporting data, and working with national and international institutions -directly or indirectly affects each developing (Article 5) country's ability to meet its obligations under the Montreal Protocol treaty.

For this reason OzonAction has completely transformed and updated its NOO training programme to assist NOUs is successfully understanding all the roles and requirements and in carrying out their daily tasks in Montreal Protocol implementation.

The main objective of this training programme is to provide new National Ozone Unit (NOU) staff with essential information about the Montreal Protocol, a country's obligations under the Montreal Protocol, and the main activities carried out by NOUs. It aims to provide new NOU staff with fundamental knowledge and information tools that will enable them to support their national government in meeting the commitments agreed by all countries under the Montreal Protocol.

Download the flyer >>>

Contact: **Mikheil Tushishvili**, Montreal Protocol Programme Officer, UNEP-OzonAction.

OzonAction Factsheet: Article 7 Data Reporting on HFCs - When Countries Need to Start Reporting

One of the important commitments of the Protocol is that of reporting the consumption and production of substances controlled under the Montreal Protocol.

Following ratification of the Kigali Amendment, this commitment is now extended to HFCs.

This short factsheet provides some useful information on relevant Article 7 reporting dates and deadlines for HFCs.

Download the Factsheet

Contact: **Ezra Clark**, UNEP, OzonAction

HS Codes for HFCs - Advice for countries in advance of the 2022 HS code update

The Kigali Amendment requires Parties to put into place an import and export licensing system for hydrofluorocarbons (HFCs) by 1st January 2019 (or two years later if required).

To enable a licensing system to function effectively, it is important that the government is able to monitor and record imports and exports of each specific HFC individually.

Import and export statistics are normally collected by customs officers using the international product nomenclature system – the Harmonized Commodity Description and Coding System, or Harmonized System (HS).

However, until the HS is revised in 2022, all HFCs are contained in a single HS code which does not allow differentiation of the individual chemicals or of mixtures.

This document outlines a proactive interim approach, recommended by the World Customs Organization (WCO), to establish additional digits in the existing national HS codes to identify specific HFCs.

This practical document is suitable for outreach to the customs agencies, customs officers in the field, and others involved in controlling trade in HFCs.

Document prepared by the UN Environment Programme in cooperation with the World Customs Organization (WCO).

Download the publication

Contact: **Ezra Clark**, UNEP, OzonAction

Update on new refrigerants designations and safety classifications - factsheet

The purpose of this fact sheet is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an «R» number over the last few years and introduced into the international market.

The United Nations Environment Programme (UNEP), represented by the OzonAction-Law Division, and ASHRAE have a Memorandum of Understanding to establish technical cooperation and mutual coordination toward providing professional technical services to the refrigeration and air-conditioning stakeholders (governmental, private, and public). The organizations work to ensure that up-to-date related technical information and standards are properly introduced and promoted.

Download the Factsheet

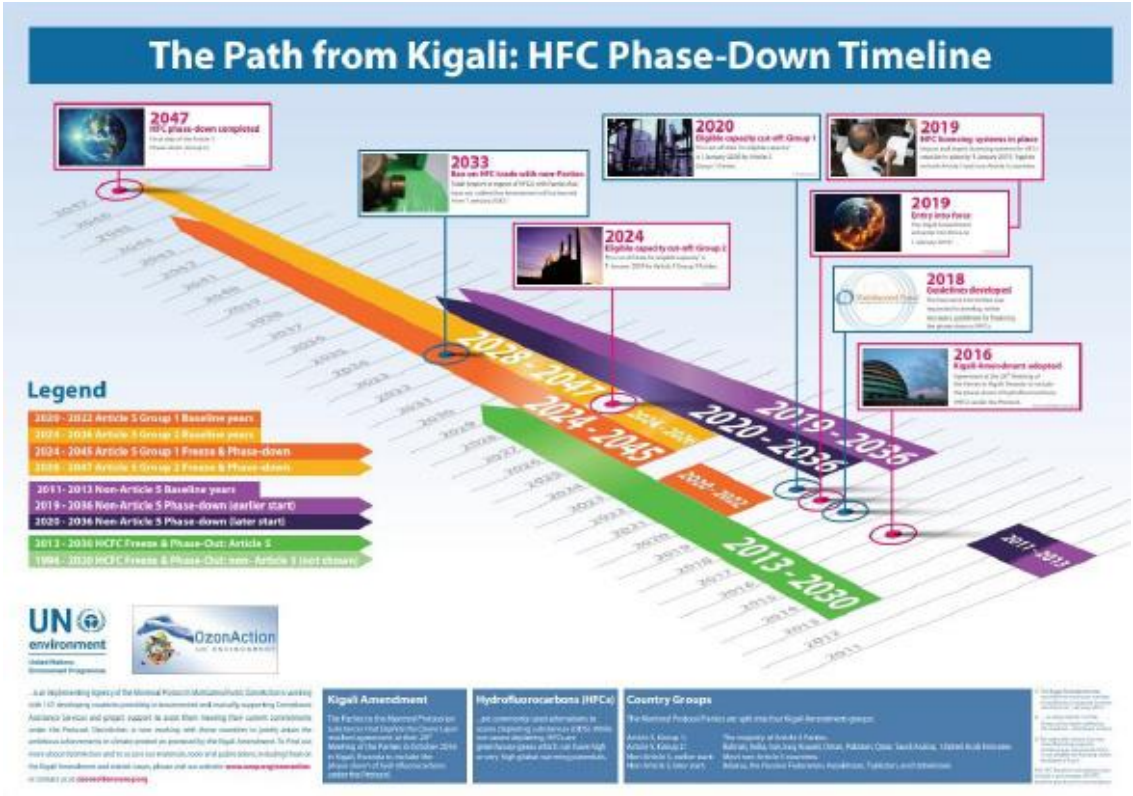
Contact:

W. Stephen Comstock, Manager of Business Development EMEA, ASHRAE
Ayman Eltalouny, Coordinator International Partnerships , UN Environment Programme OzonAction

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.

Download the publication



The Path from Kigali: HFC Phase-Down Timeline

This timeline, produced by OzonAction, highlights key hydrofluorocarbons (HFCs) phase-down dates. Click **here** to download the timeline

Good Servicing: Flammable Refrigerants Quick Guide

This is the electronic and interactive version of the UN Environment Programme OzonAction Quick Guide on Good Servicing Practices for Flammable Refrigerants. It offers easy reference to the key safety classification and technical properties of flammable refrigerants that are available in the market.
It also provides important safety guidance for the installation and servicing of room air-conditioners designed to use flammable refrigerants.
This interactive guide allows you to scroll and browse the text, jump to specific chapters or use the comprehensive dynamic index to locate specific keywords, figures and tables. The application also includes a refrigerant charge size calculator and a room size calculator for flammable refrigerants.

Available for free on the Google play store (Apple

version coming soon). Search for “UNEP Quick guide” or use the QR code

Refrigerant Identifier Video Series

Guidance on how to identify refrigerants using a refrigerant identifier.
This new OzonAction video series consists of short instructional videos showing how to use and maintain a refrigerant identifier.
The videos provide useful guidance on safety and best practice, understanding the difference between different identifier units, testing procedures and identification of results.
It is intended for use by Montreal Protocol National Ozone Officers, Customs and Enforcement Officers as well as technicians involved in the servicing and maintenance of refrigeration and air conditioning systems.
The application features 10 short instructional videos on the following topics:

- Refrigerant cylinder types
- Types of identifiers
- Getting to know your identifier
- Safety and precautions
- Testing a sample – vapour (gas)
- Testing a sample – liquid
- Results
- Faults & error messages
- Maintaining the unit
- Software updates

Available for free on the Google play store (Apple version coming soon). Search for “UNEP Refrigerant ID” or use the QR code

GWP-ODP Calculator Smartphone Application

- Helps in understanding and reporting under the Montreal Protocol (and future commitments under the Kigali Amendment)
- The calculator will automatically perform the conversion between metric tonnes, ODP tonnes and/or CO_2-equivalent tonnes (or kg) and display the corresponding converted values
- The app includes both single component substances and refrigerant blends

- The components of a mixture and their relative proportions (metric, ODP, CO_2-eq) are also displayed.

Available for free from the Apple IOS store and Google PlayStore. Search for "GWP ODP CALC" in the Playstore to install! Download it Now!

The application allows you to easily convert ODP, CO_2-eq and metric quantities of refrigerants and other chemicals.

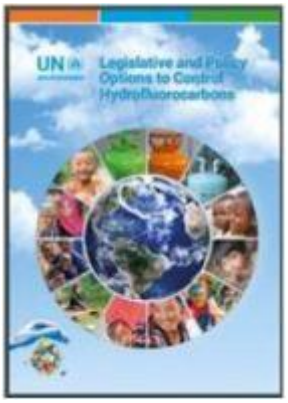
OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series - Over 50,000 downloads to date -

OzonAction has launched an exciting new application which hosts series of short instructional videos on techniques, safety and best practice for refrigeration and air-conditioning technicians.
This application, consisting of short instructional videos on techniques, safety and best practice, serves as a complementary training tool for refrigeration and air-conditioning (RAC) sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training.

New videos on flammable refrigerants just added!
Please share with your RAC associations, technicians and other interested stakeholders…

OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series Available in the **Android Play Store** and **Apple Store/iTunes**. (Just search for "OzonAction", or scan this QR code)

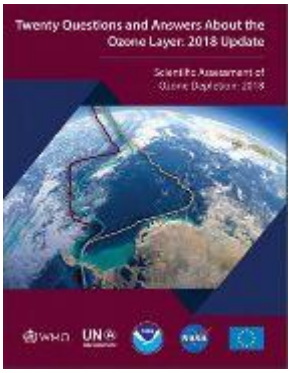
PUBLICATIONS



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.



Twenty questions and answers about the ozone layer: 2018 update, is a component of the Scientific Assessment of Ozone Depletion: 2018 report. The report is prepared quadrennially by the Scientific Assessment Panel (SAP) of the Montreal Protocol on Substances that Deplete the Ozone Layer.

Lead Author: Ross J. Salawitch
Coauthors: David W. Fahey, Michaela I. Hegglin, Laura A. McBride, Walter R. Tribett, Sarah J. Doherty

Read / Download: **20 Questions and Answers about the ozone layer-2018** | **Figures**

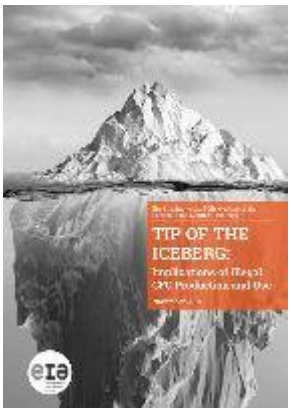
Primer on Hydrofluorocarbons (HFCs) - IGSD -11 January 2018 - Fast action under the Montreal Protocol can limit growth of hydrofluorocarbons (HFCs), prevent 100 to 200 billion tonnes of CO_2-eq by 2050, and avoid up to 0.5°C of warming by 2100.

Lead authors: Durwood Zaelke, Nathan Borgford-Parnell, and Stephen O. Andersen.
Contributing authors: Kristin Campbell, Xiaopu Sun, Dennis Clare, Claire Phillips, Stela Herschmann, Yuzhe Peng Ling, Alex Milgroom, and Nancy J. Sherman.

The **IIR International Dictionary of Refrigeration**
Available in 11 languages, the complete version of the International Institute of Refrigeration (IIR) International Dictionary of Refrigeration is now freely accessible online.
The IIR International Dictionary of Refrigeration offers researchers, industrialist or administrations the practical resources required to produce content related to refrigeration technologies in multiple languages.
This online tool allows you to find definitions, in English and French, of scientific and technical terms, as well as identify terms in the language of your choice and find corresponding translations in the 10 other languages.
The dictionary provides term searches in Arabic, Chinese, Dutch, English, French, German, Italian, Japanese, Norwegian, Russian and Spanish.
Access the International Dictionary of Refrigeration on the **IIR website**

Impact of Standards on Hydrocarbon Refrigerants in Europe – Market research report.
The market research report was realised for the EU-funded **LIFE FRONT** project. Amongst the main result of the market research:

- Current charge limits set in standards both restrict and obstruct the development of hydrocarbon technology
- Over 50% survey respondents already work with hydrocarbons to some extent
- Most of those planning to start working with hydrocarbons in the future will do that in 2019-2020 timeframe - revision of standards could have a major impact on the scale of this shift
- Large proportion of respondents indicated they manufacture equipment using multiple refrigeration circuits - allowing higher hydrocarbon charge limits per single refrigeration circuit would have a profound impact on cost and availability of larger units.



Tip of the Iceberg: Implications of Illegal CFC Production and Use.
The Environmental Investigation Agency (EIA) recently released report urges Parties to the Montreal Protocol to address a number of remaining unanswered questions, in particular the absence of comprehensive data regarding the size of current banks of CFC-11 in PU foam and other products or equipment.

Cold Hard Facts 3 - Review of the Refrigeration and Air Conditioning Industry in Australia
[...] This study provides a broad view of the composition, size and value of the industry, and projections for its future. This will assist industry and policy makers with management of ozone depleting substances as they are phased out, and synthetic greenhouse gases, including hydrofluorocarbons (HFCs) which are being phased down from January 2018.

Ozone-depleting substances 2019 Aggregated data reported by companies on the import, export, production, destruction, feedstock and process agent use of ozone-depleting substances in the European Union, 2006-20181994-2019 - The 2019 edition of the European Environment Agency (EEA) report on ODS confirms that the EU has already achieved its goals on the phase-out of such substances under the Montreal Protocol. [...]

Benefits of Energy Efficient and Low-Global Warming Potential Refrigerant Cooling Equipment
Authors: Nihar Shah, Max Wei, Virginie Letschert, Amol Phadke.
Energy Analysis and Environmental Impacts Division
Lawrence Berkeley National Laboratory
August/2019

Lower-GWP Alternatives in Stationary Air Conditioning: A Compilation of Case Studies -The case studies in this booklet discuss several applications in the stationary air conditioning sector. The applications include chillers of natural refrigerants and hydrofluoroolefins (HFOs) as well as split-units which use hydrocarbons (HCs) as the refrigerant. The technologies presented in these case studies are only some examples of the many available options for zero and lower GWP substances. The examples take into account design criteria such as system performance, environmental impact and cost. All these refrigerants still have many challenges that should be considered in the design, for example their flammability, toxicity, lower efficiency in some cases, and cost. Balancing these challenges using a consistent and comprehensive methodology across all refrigerants and system types is essential in assessing alternatives...

Climate and Clean Air Coalition (CCAC), 2019

Latest issue of Centro Studi Galileo magazine,
Industria & Formazione, n. 2 - 2020
(in Italian language).

COVID-19: Regular and correct maintenance of ventilation systems - General Eurovent recommendations for equipment care during the coronavirus pandemic.

In this GENeral Document, Eurovent presents general and basic recommendations on the operation of ventilation systems during the coronavirus pandemic.

The document also provides additional sources of information on COVID-19.

Read/download

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 are pleased to 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*

New International Journal of Refrigeration service for IIR members

Access the complete archives of the International Journal of Refrigeration (IJR) online. Designed with IIR members in mind, this new and practical electronic subscription gives members substantial advantages:

- Immediate and permanent access to the latest research and to IJR archive
- Access the latest articles as soon as they become available online.
- Browse, search and read each one of the nearly 4,500 papers since Volume 1, Issue 1.
- Unlimited access to seminal contributions to the field of refrigeration dating back to 1978.
- Keep up-to-date with subscriptions to customized e-alerts on New Volumes, Topics and saved Searches. Enhanced content and functions
- Easily export references, citations and abstracts.
- Print, download or share articles with colleagues or peers.
- See which papers, published in Elsevier or elsewhere, have cited any selected article.
- Consult the research highlights overview of articles in volumes from 2012 onwards.

To access this new service, click "**activate my e-IJR subscription now**" and follow the instructions.

International Observers - New AREA membership category

Due to the significant worldwide interest in European legislative developments and the increase in competence of personnel who handle new refrigerants, AREA is pleased to introduce its brand new "International Observer" membership category. This provides a fantastic opportunity for non-European RACHP installer bodies the world, to benefit from the expertise and discussions within Europe through access to AREA.

Contact: **info@area-eur.be**

GIZ Proklima Cool Training is a series of international trainings on the safe use of natural refrigerants in the refrigeration and air-conditioning (RAC) sector. Launched in 2014, these trainings have since supported the worldwide promotion of sustainable cooling technologies by providing training on the safe handling of natural refrigerants. Main target group are international RAC technicians and trainers as well as political decision makers from developing countries and emerging economies. Depending on the training program, the courses are offered as one-week or two-week packages aiming at NOU representatives and technicians, respectively.

Schedule 2020

- Technician Training: 4-15 May 2020
- Policy Training: 2-5 June 2020 (in English/French)
- Policy Training: 15-19 June 2020 (in Spanish)

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