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Volume XX | 15 January 2020

OzoNews is Turning 20!

The OzoNews 15 January 2020 issue marks 20 years of continued service of providing a regular and concise news update directly to your screen.

In January 2000, OzonAction launched its e-news service: 'OzoNews'. Twice every month OzoNews has been distributed electronically all around the world, bringing our readers regular information and updates on implementation of the Montreal Protocol and ozone and climate protection, Science and technological advances, News stories, Montreal Protocol and Multilateral Fund updates, OzonAction and other Implementing Agencies meetings and activities, Upcoming events, and much much more …

In January this year, after almost 600 issues of OzoNews, and thousands of articles from around the globe, OzonAction is delighted to bring you

The OzoNews 20th anniversary edition

On this occasion, OzonAction is pleased to present you with a new template, and a brief commemorative **video**. Moreover, progressively we are making available the **early issues of OzoNews**, starting from 2000.

The recent survey found OzoNews among the top four information resources, thanks to your continued interest, invaluable support and feedback throughout the years.

Contact: **samira.degobert@un.org**

In this Issue:

GLOBAL

1. Kigali Amendment latest ratifications

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

Guinea, 5 December 2019

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


UNITED NATIONS

EP

United Nations Environment Programme

REPORT OF THE EIGHTY-FOURTH MEETING OF THE EXECUTIVE COMMITTEE

Introduction

2. Report of the 84th meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, Montreal, Canada, 16 - 20 December 2019

Introduction

1. The 84th meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol was held at the headquarters of the International Civil Aviation Organization, Montreal, Canada, from 16 to 20 December 2019.

2. The meeting was attended by representatives of the following countries, members of the Executive Committee in accordance with decision XXX/18 of the Thirtieth Meeting of the Parties to the Montreal Protocol:

(a) Parties not operating under paragraph 1 of Article 5 of the Protocol: Belgium, Canada (Chair), France, Hungary, Japan, Norway and the United States of America; and

(b) Parties operating under paragraph 1 of Article 5 of the Protocol: Argentina, Benin, China, Grenada, Kuwait, Niger and Rwanda (Vice-Chair).

3. In accordance with the decisions taken by the Executive Committee at its second and eighth meetings, representatives of the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) as both implementing agency and Treasurer of the Fund, the United Nations Industrial Development Organization (UNIDO) and the World Bank attended the meeting as observers.

4. The Executive Secretary and the Deputy Executive Secretary of the Ozone Secretariat, the President of the Bureau, the Vice-President of the Implementation Committee, members of the task force on the replenishment of the Multilateral Fund for the 2021–2023 triennium of the Technology and Economic Assessment Panel (TEAP) and the Acting Director of the UNEP Law Division were also present.

5. Representatives of the Alliance for Responsible Atmospheric Policy, the Environmental Investigation Agency, the Institute for Governance and Sustainable Development, the Private Sector Commission for Studies on Sustainable Development of Mexico and the Refrigerant Gas Manufacturers' Association of India also attended as observers. [...]

The Multilateral Fund for the Implementation of the Montreal Protocol, December 2019

3. Research shows Montreal Protocol is slowing global warming

By 2050 global temperatures will be, on average, 1°C (1.8°F) lower than they would have been without the ozone-protection agreement.

New research carried out by scientists from the University of New South Wales (UNSW), Australia, has shown that the Montreal Protocol, designed to protect the ozone layer by phasing out CFCs, has reduced the global rise in temperatures even more than the Kyoto climate change agreement.

"By mass CFCs are thousands of times more potent a greenhouse gas compared to CO_2, so the Montreal Protocol not only saved the ozone layer, but it also mitigated a substantial fraction of global warming," Rishav Goyal, lead author of the paper, told the UNSW Newsroom website.

The researchers found that, by mid-century, the measures in the Montreal Protocol will have avoided 1°C (1.8°F) of temperature change on a global average. In the Arctic, the effect is even greater, and the avoided temperature there will be as much as 3-4°C (5.4-7.2°F) come 2050. This corresponds to 25% mitigation of global warming, according to the authors.

“Remarkably, the [Montreal] Protocol has had a far greater impact on global warming than the Kyoto Agreement, which was specifically designed to reduce greenhouse gases,” Goyal added. “Action taken as part of the Kyoto Agreement will only reduce temperatures by 0.12°C by the middle of the century – compared to a full 1°C of mitigation from the Montreal Protocol.”

The scientists behind the study, published in Environmental Research Letters in December 2019, were modeling global climate scenarios under two different sets of atmospheric chemistry conditions, with and without the Montreal Protocol measures to curb f-gas emissions.

They extended these simulations into the future, using an estimated CFC emissions growth of 3% per year for the scenario without the Montreal Protocol. This is a conservative estimate, and lower than the actual growth seen in the years before the adoption of the protocol.

With these models, the researchers found regional differences. In some areas of North America, Eurasia and Africa a temperature rise of 0.5-1°C (0.9-1.8°F) has already been avoided, and in these areas the estimated reduction in temperature will be 1.5-2°C (2.7-3.6°F) by mid-century.

With their models, the researchers also found that the Montreal Protocol measures have helped reduce polar ice melt, with the Arctic sea ice being 25% higher today than it would have been without the protocol.

“The success of the Montreal Protocol demonstrates superbly that international treaties to limit greenhouse gas emissions really do work,” co-author of the study, Professor Matthew England, said. “They can impact our climate in very favorable ways, and they can help us avoid dangerous levels of climate change.”

R744, 8 January 2020, By: Tine Stausholm

4. The impact of continuing CFC-11 emissions on stratospheric ozone

Summary
Stratospheric ozone protects the Earth's biosphere from harmful ultraviolet radiation and is key in determining the radiative balance of the atmosphere. CFC-11 is a man-made chlorofluorocarbon, and its emissions and subsequent break down in the stratosphere result in ozone depletion.

Because of this, production and consumption of CFC-11 have been controlled under the Montreal Protocol, resulting in a rapid decline in emissions starting in the late 1980s.

Recent studies show that CFC-11 emissions have increased in recent years, at odds with expected declines caused by the Montreal Protocol controls.

In this study, we examine how potential future CFC-11 emissions will impact stratospheric ozone. The ozone response is proportional to the amount of CFC-11 emitted, and the response is substantial for a future projection in which the increased emissions during 2013-2016 continue to 2100.

This scenario will postpone the return of global ozone to 1980 levels from mid-2052 to 2060, and cause additional 1% global ozone depletion by 2100, compared to the baseline. Although there is uncertainty in projecting future emissions, the ozone response is strongly dependent on the amount of CFC-11 emissions accumulated over time, allowing for a simple metric relating the ozone depletion to the cumulative amount of emissions.

***Authors**: Eric L. Fleming Paul A. Newman Qing Liang John S. Daniel*

AGU 100, 10 January 2020

ASIA PACIFIC

5. Bhutan’s first batch of refrigeration and mobile air-conditioning students

Under the Montreal Protocol on Substances that Deplete the Ozone Layer, the

technicians who work in refrigeration and air conditioning play a major role because they handle the refrigerant gases that are controlled under that international environmental agreement. Since the quality of their work directly affects their country's compliance with the Montreal Protocol, it is crucial that the workforce is skilled and well-trained.

To this end, the National Ozone Unit (NOU) in Bhutan's National Environment Commission developed a fully-fledged Technical and Vocational Education Training (TVET) curriculum for the trade of Refrigeration Air-Conditioning (RAC) and Mobile Air-Conditioning (MAC) servicing technicians, and the course was adopted by the Ministry of Labour and Human and Resources that manages the country's TVET programme.

UNEP OzonAction is proud to have contributed to the development of this curriculum. The two-year course was launched in September 2019 with ten enrolled students, who have now graduated to become the first TVET-trained RAC and MAC servicing technicians in Bhutan.

As a country that consumes low volumes of the controlled substances, which include hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs), Bhutan has a relatively small baseline consumption of HCFCs and the demand is only in the RAC servicing sector. However, with the recent economic development and urbanization, the use of refrigeration and air-conditioning equipment and of vehicles with air-conditioning has been increasing. The demand for HCFCs and HFCs is thus expected to grow in the coming years under a business as usual scenario.

Previously, there were no formal courses provided within the national qualification framework of Bhutan that focused specifically on RAC and MAC. Based on the survey conducted under the Enabling Activities for HFC phasedown Project, among 150 refrigeration servicing technicians currently in Bhutan, 80% have not received formal training in RAC and MAC; the remainder received training under mechanical engineering courses in the technical training institutes of Thimphu and Samthang.

Strengthening the capacity of the RAC servicing technicians is a key activity under the country's HCFC Phase-out Management Plan (HPMP). As the HPMP lead agency, UNEP OzonAction assisted the NOU with the development of the TVET curriculum and the assessment package for RAC and MAC, while UNDP as the HPMP cooperating agency procured training tools for the two selected technical training institutes to conduct practical sessions under the courses.

The new training programme has already made a difference in the graduate's lives. This is what one of the students, 20-year-old Kinley Tshering, had to say about it: “I was motivated by my uncle and aunts who are the engineers and they recommended me to join this course. They see a lot of potential in this area”. During winter holidays, student get internships with private servicing sector companies to gain hands-on practical experience. Students recently submitted a proposal for the repair and upgrading of old refrigeration and air-conditioning units and won an interest-free loan from a local non-for-profit organization to develop and test entrepreneurial skills as part of the training.

The launch of this course is also significant given the Government's current interest to build an agile and relevant technical vocational training and skills development system in the country. This course, which is provided by one of the leading public technical training institutes, showcases how the TVET system can be more forward-looking in responding to the upcoming needs of industry and mainstreaming environmental sustainability into TVET.

During the mission of UNEP OzonAction CAP to Bhutan in December 2019, further needs in this area were discussed with the representatives of the Ministry of Labour and Human and Resources, the Technical Training Institute and the NOU at the National Environment Commission. It was agreed that the course material needs to be updated to align it with the objectives of the Kigali Amendment and to include the safety and energy efficiency aspects of refrigerant handling. More work stations need to be added in the training institutions for the practical sessions. There is also a need to develop a "Recognition for Prior Learning" for practising technicians since the Government is planning to introduce a mandatory certification for safe handling of refrigerants.

The Government of Bhutan is now a party to the Kigali Amendment with the submission of the instrument of ratification on 27 September 2019. These students will be the first generation of systematically-trained technicians who will help the country to progress with the safe adoption of HFC alternatives in the country.

Contact: **Liazzat Rabbiosi**, Programme Officer for South Asia Network, UNEP Office for South-east Asia, Bangkok, Thailand

UNEP, OzonAction, 9 January 2020

6. India bans import of harmful hydrochlorofluorocarbon that depletes the ozone layer

Prohibition will be in effect from January 1, 2020

The Ministry of Environment, Forest and Climate Change (MoEF & CC) has issued a notification that mentions that the issuance of the license for the import of hydrochlorofluorocarbon (HCFC)-141b will be prohibited from January 1, 2020.

This move comes after the ministry amended a set of regulations and renamed it as 'Ozone Depleting Substances (Regulation and Control) Amendment Rules, 2019.
HCFC comprises inert compounds of carbon, hydrogen, and fluorine, and it is used instead of chlorofluorocarbon (CFC) as it is less destructive to the ozone layer.
The new regulations will come into effect from the date of their final publication in the official gazette.

According to the notification, the manufacturing of pre-blended polyols, which has been categorized under group VI of ozone-depleting substance, will phase-out from January 1, 2020.
Meanwhile, pre-polymers include pre-blended polyols that contain substances listed in Group VI of the regulations that will be banned after six months from the execution of these newly-amended regulations.

Under the Environment (Protection) Act, 1986 (29 of 1986), the central government made the Ozone Depleting Substances (Regulations and Control) Rules, 2000, which was notified on July 19, 2000.

The ministry states that the amendment has been made to enforce the phase-out of Group VI substances used in the manufacture of all other foam products, including discontinuous sandwich panels, as stated in the Ozone Depleting Substances (Regulation and Control) Amendment Rules, 2014.

Since its publication in July 2000, the regulations have been amended six times, and the last amendment was issued in March 2014.
In April 2019, Mercom reported that air pollution caused nearly 4.9 million deaths in 2017 with India and China, accounting for 1.2 million each, which was the highest in the world.

Previously, India launched the National Clean Air Program (NCAP) to battle the increasing level of pollutants in the air. It is a five-year action plan with 2019 as the first year.

In its effort to reduce pollution, the Ministry of Power also proposed a ₹835 billion (~$11.70 billion) plan to meet the cost of development of Flue Gas Desulfurization to improve air quality and to conform to new norms notified by the MoEF & CC for power plants.

MERCOM India, 7 January 2020, By: Anjana Parikh

WEST ASIA

7. Sultanate of Oman strengthens capacity of technicians to provide cool services that protect environment

Refrigeration and air conditioning is at the heart of the Montreal Protocol on Substances that Deplete the Ozone Layer.

Many of the refrigerant gases controlled under this treaty, including hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs), have adverse environmental impacts if released to the atmosphere as the result of leaks, improperly-installed or poorly-maintained equipment.

The UN Environment (UNEP) and the Sultanate of Oman recognize that the skills of the workforce who install and service refrigeration and air conditioning equipment is key to optimizing the equipment performance and protecting the environment.

Accordingly, UNEP's OzonAction Compliance Assistance Programme in West Asia joined with the Sultanate of Oman's Ministry of Environment and Climate Change and the Ministry of Manpower to upgrade the skills of the country's refrigeration and air conditioning technicians on the latest techniques in leak detection, safe handling of refrigerants and application of good practices in servicing.

The training, which was supported by the Montreal Protocol's Multilateral Fund, was conducted from 24-26 December 2019 at the Seeb Vocational Training Center.

Contact: **Khaled Klaly**, Montreal Protocol Regional Coordinator for West Asia, UNEP OzonAction Manama, Bahrain

UNEP, OzonAction, 6 January 2020,

EUROPE & CENTRAL ASIA

8. Turkmenistan to join number of international conventions

Turkmenistan will join a number of international conventions in 2020, said the Deputy Prime Minister and foreign Minister Rashid Meredov at a meeting of the government today, providing President Gurbanguly Berdimuhamedov with proposals for joining international conventions and multilateral documents in a number of areas, the state news agency reports. [...]

Among the conventions the country will join:
The Stockholm Convention concerning environmental protection sector on persistent organic pollutants, which provides for the cessation of the use of persistent toxic substances-organic pesticides. As well as the Kigali amendment to the Montreal Protocol on substances that Deplete the ozone layer, aimed at consistently reducing the production and consumption of substances that harm the environment. [...]

Turkmenistan is currently a party to 152 multilateral international instruments. These include 133 conventions adopted by the UN and its specialized agencies.

AKIPRESS, 13 January 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 Uited Nations Environment Programme as soon as possible but **at the latest by: 31 January 2021**.

Learn more >>>

NORTH AMERICA

9. 3 Low-impact options for replacing R22 refrigerant

The phase-out of several common commercial refrigerants is leading building owners to look for greener alternatives.

R22, one of several hydrofluorochlorocarbon (HCFC) refrigerants commonly used in commercial air conditioners, cold storage, chillers and retail food refrigeration, is likely to disappear from the market soon. Also on the chopping block are R134a, which is often used in refrigeration and light air conditioning, and R123, which has been used as a retrofit alternative in low-pressure centrifugal chillers.

The two-stage phase-out is governed by the Montreal Protocol, an international treaty that controls the elimination and use of ozone-depleting substances. The EPA was in charge

of implementing the phase-out in the U.S. A 2019 lawsuit challenging the agency's authority to de-list refrigerants paused the EPA's ability to enforce the ban nationally. However, many states (especially ones that are members of the U.S. Climate Alliance, a bipartisan coalition of states committed to international climate initiatives) are establishing similar rules on a state level, explains Ivan Rydkin, engineer, refrigerant gases, for Daikin America. This action at the state level is driving many manufacturers to move forward with the phase-out anyway.
That means that the 34 HCFCs on the list – including R22, R134a and R123 – are still likely to disappear from the market soon.

Older refrigerants will still be available for a while even after manufacturers stop making them, and R134a chillers are legal for new purchase through Jan. 1, 2024, so you don't have to rush out and stock up. But it may be worth the hassle to retrofit your equipment for newer refrigerants now, Rydkin says.

"If you have a much older system that has to be replaced within the next few years, the recommendation we give is to replace it now prior to any new regulations coming into force in 2022 and 2023," Rydkin explains. "We really encourage building owners to be ahead of the regulation curve so they're compliant today, and then those systems will stay in compliance for the near future."

Here's how you can make sure you're using refrigerants that will stay compliant.

Understand Refrigerants and Global Warming Potential
The environmental impact of refrigerants is measured by two key indicators – ozone depletion potential (ODP) and global warming potential (GWP).

Ozone depletion potential refers to the amount of ozone depletion a substance can cause compared to a similar amount of CFC-11, the first widely used refrigerant. This chemical went out of production in the U.S. in 1996 and has an ODP of 1.

Global warming potential measures how much energy the emissions of a gas will trap over a given time period compared to carbon dioxide, which has a GWP of 1. In both cases, lower numbers indicate lower environmental impact.
"Ozone depletion potential refrigerants were replaced by some high-GWP refrigerants. At the time of development, we knew they were stable, but we didn't know they had a global warming impact," Rydkin explains. "Some gases, like R404A, have a global warming impact of up to 4,000, whereas R22 was around 1,800."

High-GWP gases become dangerous to the environment when they leak. Some units, such as large commercial rooftop air conditioners or the refrigeration units in supermarkets, can lose 25-30% of their refrigerant charge every year, Rydkin says, ultimately emitting thousands of pounds of refrigerant gas into the air. The challenge to the market is to create a viable alternative that marries highly efficient heat transfer with low global warming potential and no ozone impact.

3 Low-GWP Refrigerants
Manufacturers have responded to the phase-out by developing workable new refrigerants and modernizing old ones. These options aren't an exhaustive list – the EPA maintains a large database online broken down by end use and equipment type – but they represent

some of today's most popular refrigerant alternatives.

1. High-Pressure CO_2
CO_2 was one of the earliest commercial refrigerants, along with ammonia. It fell out of favor because it requires high pressure to serve as a refrigerant, which requires a high temperature for the compressor. The colorless, odorless gas is starting to make a comeback because the global warming potential is only 1 – leaks are only leaking CO_2, not fluorocarbons.
The systems tend to have a higher first cost than other systems of similar size because of the complexity involved, but this may decrease if the technology gains wider acceptance. Stores like Aldi are beginning to embrace the technology as part of a larger effort to lower environmental impact. Some have even earned the EPA's GreenChill certification, a designation recognizing food retailers who meet the agency's criteria on refrigerant type, emissions and charge.

2. Propane
Supermarkets and other retailers are increasingly using standalone units, many of which use propane as the refrigerant, Rydkin says. "It has a global warming potential of 13, so that's much lower than what was used before," Rydkin adds. "Hydrocarbon standalone cases have shaken up the market in the last few years."

3. R1234ze and R1234ze(Z)
Some of the new designs on the market for chillers and medium temperature refrigeration replace R134a (GWP of around 1,300) with R1234ze, which has a GWP closer to 1.
"The big impact is for large chillers that cool skyscrapers and hospitals. They're moving to 123ze(Z) from either R123 or R134a," Rydkin says. "There, they're going from a mildly toxic option to a nontoxic, low-GWP option. In the large chiller space, there have been a lot of programs to get down to an environmental impact that we're comfortable with while at the same time adding a tiny bit of efficiency gain."

When and Why to Replace Refrigerants
Some systems allow you to replace your existing refrigerant with a new one as long as you make a few small changes, like changing the unit's oil and adjusting some valves. Both are fairly common procedures in supermarkets that are upgrading refrigeration units, Rydkin explains. It's much less common to retrofit different refrigerants into larger equipment, like chillers, because of the engineering obstacles involved.

California is proposing not allowing certain high GWP refrigerants for retrofits after 2022, Rydkin adds. It's unclear whether other markets will adopt the same stringent requirements. When it comes to avoiding a big capital expenditure, Rydkin recommends being safe rather than sorry. "If you're in a Climate Alliance state, do a retrofit now if you can," he advises. "Otherwise, you're going to be replacing the equipment later."

Buildings, 9 January 2020, By: Janelle Penny

10. University of Birmingham and International Solar Alliance help 'sun-rich' farmers

The National Fire Protection Association (NFPA) has introduced a training programme to educate US firefighters about flammability and toxicity risks associated with new refrigerants.
The NFPA recognises that the introduction of new lower GWP refrigerants being introduced as part of the worldwide phase down of HFCs, many of them exhibiting varying degrees of flammability, pose potential risks to firefighters.

To meet this new challenge, the NFPA and its research affiliate, the Fire Protection Research Foundation, have released free online training for the fire service, as well as an instructor-led training module to educate firefighters about the potential hazards associated with new refrigeration and cooling units.

The push for more sustainable solutions is driving the need for firefighters to learn about potential flammability and toxicity risks, asphyxiation challenges, jet stream fires, transportation issues, and other life safety considerations associated with flammable refrigerants.

The approximately one-hour curriculum provides an overview of the GWP transition and highlights specific dangers that firefighters may encounter when responding to incidents where new flammable refrigerants are present. The training is being funded by the US Fire Administration.

The National Fire Protection Association claims to have 50,000 members worldwide and 9,000 volunteers working with the organisation through its 250 technical committees.

The four training modules charts the background to the new generation of refrigerants; identifies where flammable refrigerants are likely to be found; describes the main flammability, toxicity and pressure release hazards; relates the refrigerant charge size to the level of risk; evaluates the hazards present in a particular situation involving flammable refrigerants; suggests response tactics to mitigate consequences from refrigerants in different types of emergencies.

“Firefighters have an inherently dangerous job that requires them to follow SOPs [standard operating procedures] and take steps to learn about the emerging threats that put people, property and themselves at risk,” said Ed Conlin, director of NFPA emergency response and responder safety division. “The presence of flammable refrigerants at a response call in the future is highly likely, and as such, warrants the need for responders in departments of every type, size and setting to learn all that they can about these systems and proper response strategies.”

CoolingPost, 12 January 2020

11. Methylene chloride brings ozone depletion angle to TSCA debate

The US EPA should consider the ozone-depleting potential of methylene chloride and other halogenated solvents in its [Toxic Substances Control Act] TSCA risk evaluations, according to one NGO.

Published in October 2019, the draft review of methylene chloride identifies unreasonable risk for a number of uses of the substance, also known as dichloromethane or DCM, due to a host of human health concerns posed by acute and chronic exposures.

But in comments, campaign group the Environmental Investigation Agency "strongly urges" the EPA to consider the substance’s ozone effects, given the scientific community’s growing concern about the ozone-depleting potential of halogenated compounds.

Governments are phasing out ozone-depleting substances under the Montreal Protocol, in response to the widespread concern that damage to the ozone layer could contribute to higher levels of ultraviolet radiation and thereby threaten the environment and human health.

The protocol does not cover short-lived substances because, until recently, experts believed that the atmospheric half-lives were too brief to have any significant impact on stratospheric ozone. However, according to the EIA, the consensus view is now changing as new research on these substances emerges.

Chemical Watch, 9 January 2020, By: Andrew Turley

FEATURED

OZONE SECRETARIAT

- **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
- **41st Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol,**1 - 5 July 2019,
  1 - 5 July 2019, Bangkok, Thailand
- **62nd Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol**,
  29 June 2019, Bangkok, Thailand

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

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

Documents and information note for the 84th meeting of the Executive Committee, Montreal, Canada, 16-20 December 2019

- **Executive Committee Primer – 2019** - An introduction to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol
- **Report of the 83rd meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol**, Montreal, Canada, 27-31 May 2019
- **83rd meeting of the Executive Committee**
- **82nd meeting of the Executive Committee**

Learn more >>>

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: Dr. 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: Dr. Ezra Clark, UNEP, OzonAction

Update on new refrigerants designations and safety classifications - factsheet

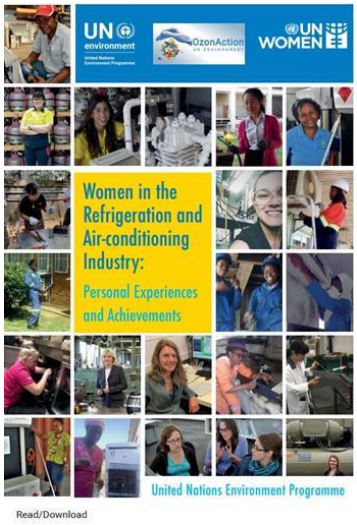
The purpose of this fact sheet is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an «R» number over the last few years and introduced into the international market.

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:

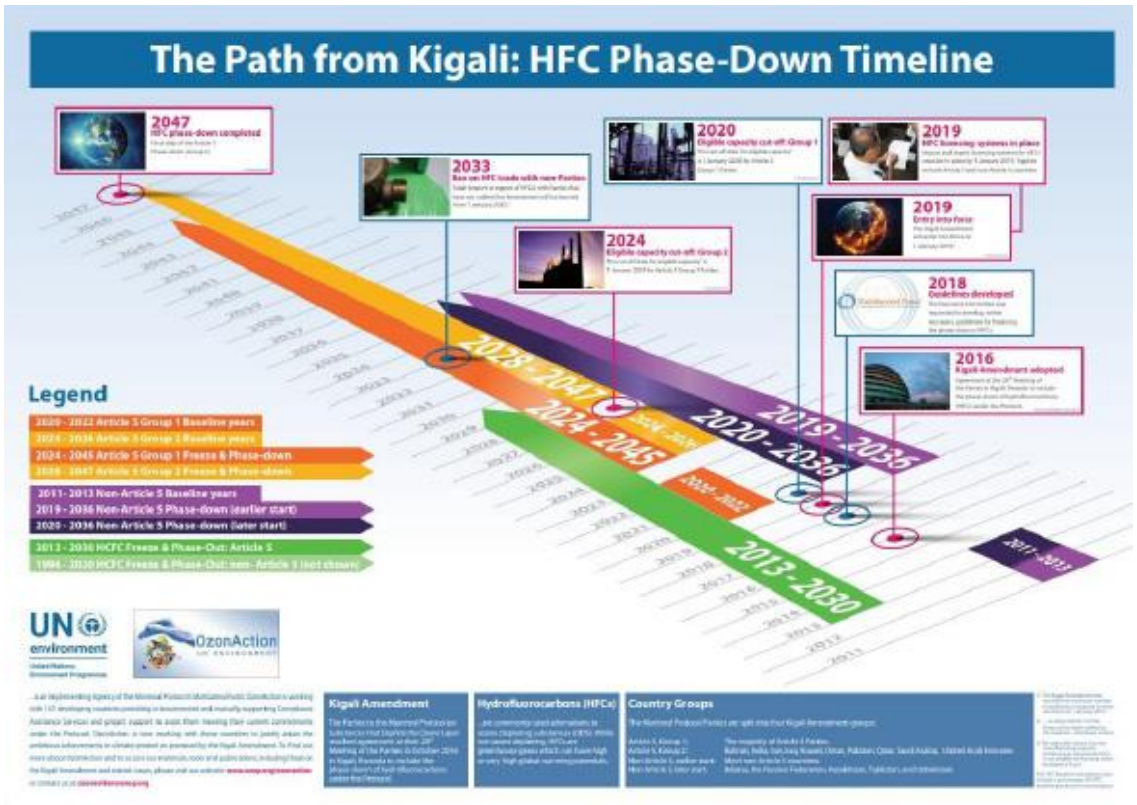
W. Stephen Comstock, Manager of Business Development EMEA, ASHRAE
Ayman Eltalouny, Coordinator International Partnerships , UN Environment OzonAction



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 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

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GWP-ODP Calculator Smartphone Application

The application allow you to easily convert ODP, CO2-eq and metric quantities of refrigerants and other chemicals.

- 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 CO2-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, CO2-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!

OzonAction Smartphone Application WhatGas? Quickly search for the information you need

- Chemical name
- Chemical formula
- Chemical type
- ASHRAE designation
- Trade names
- HS code
- CAS number
- UN number
- Montreal Protocol Annex and Control measures
- Ozone depleting potential (ODP)
- Global warming potential (GWP)
- Blend components
- Toxicity and flammability class
- Main uses

OzonAction Smartphone Application WhatGas? Available for free in the Google Play and Apple IOS Store Scan the QR code or search for "UNEP", "OzonAction" or "WhatGas?"

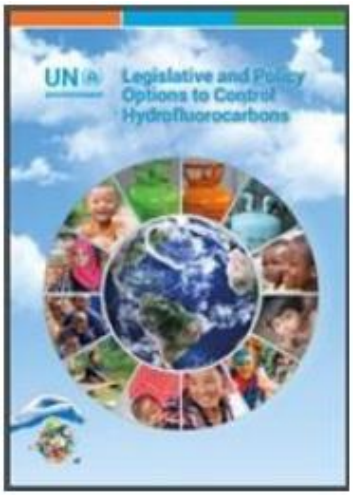
OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series - Over 50,000 downloads to date -

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)

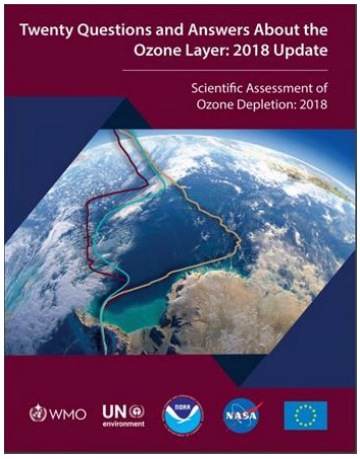
PUBLICATIONS



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.

READING



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.

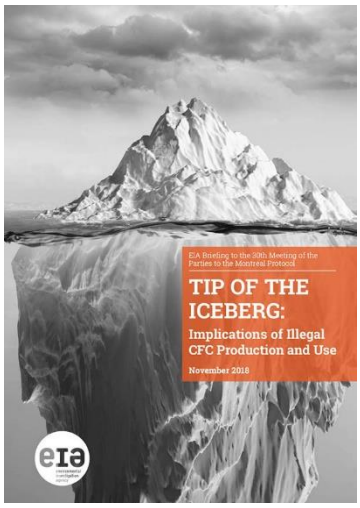
The **IIR International Dictionary of Refrigeration** Available in 11 languages, the complete version of the International Institute of Refrigeration (IIR) International Dictionary of Refrigeration is now freely accessible online. The IIR International Dictionary of Refrigeration offers researchers, 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.



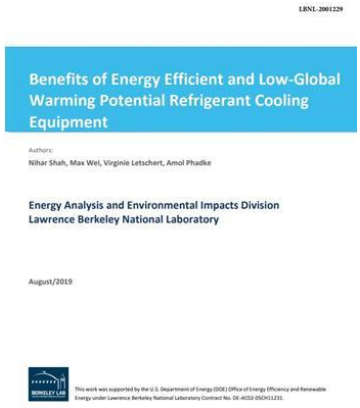
Tip of the Iceberg: Implications of Illegal CFC Production and Use.

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

The refrigeration and air conditioning industry is the largest user of synthetic greenhouse gases and ozone depleting substances in Australia. Cold Hard Facts 3 provides an economic and technological assessment of the refrigeration and air conditioning industry in Australia in 2016. The report includes an analysis of the size and economic value of the industry, the equipment and refrigerant gas bank, trends in gas imports and equipment, and direct and indirect emissions in this sector. [...] 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. In particular, the report shows that in 2018, the consumption of ODS (an aggregated parameter that integrates imports, exports, production and destruction of ODS, except those for feedstock use) in the EU was negative (-1 505 metric tonnes), which means thatmore ODS were destroyed or exported than produced or imported. This was the case since 2010 with the exception of 2012. These negative values are the result of the phase-out according to Regulation (EC) No 1005/2009, which, in many aspects, goes further than the Montreal Protocol, in combination with rather high destruction rates and decreasing stocks. Companies in the EU have been consuming relatively small amounts of ODS 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

The Economist Intelligence Unit (EIU) newly launched report **The Cooling Imperative: Forecasting the size and source of future cooling demand** forecasts the size and source of future cooling demand out to 2030. Commissioned by the Kigali Cooling Efficiency Program (K-CEP), this report quantifies the cooling market in unit sales and financially and maps out what the transition to more efficient, climate-friendly cooling could look like.

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. 9 - 2019
(in Italian language).

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, OzonAction

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

New International Journal of Refrigeration service for IIR members

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Prepared by: Samira Korban-de Gobert, OzonAction
Reviewed by: Dr. Ezra Clark, OzonAction

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