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[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.](#)

Global

1. Kigali Amendment latest ratifications

Congratulations to the latest countries which have 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](#)



2. Sound Management of Refrigerants (SI), 6.5 PDHs, and Refrigerants Literacy (SI), 4.5 PDHs

ASHRAE and UNEP have partnered to create web-based, interactive learning courses that earn certificates for successful completion. The learning platform tracks your progress, allowing you to take courses in stages when time is available. Learning checks throughout courses prepare you for a final exam.

These courses are available only to ASHRAE members and to those who have been provided an access code by UNEP.

Refrigerants Literacy (SI), 4.5 PDHs

This course offers basic understanding about refrigerants types, policies, classifications and management practices. It is aimed at non-specialists in the field, such as facility managers, policy makers, and other individuals who are involved in refrigerant issues from a non-technical perspective. It also can serve as an introduction to refrigerant basics for those new to the industry. The course is available in English, Spanish, and French languages.

UNEP Clients: [English](#) | [Spanish](#) | [French](#)

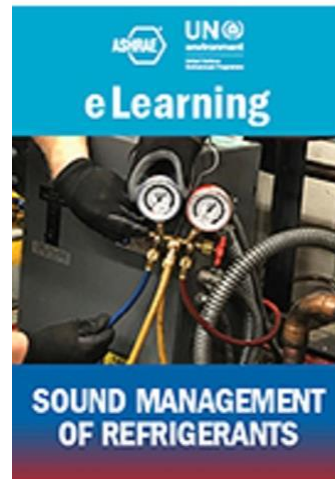
ASHRAE Members: [English](#) | [Spanish](#) | [French](#)

Sound Management of Refrigerants (SI), 6.5 PDHs

This course reviews best practices for key environmental issues, ASHRAE standards, and refrigerant terminology for air-conditioning and refrigeration specialists. Topics covered include principles of refrigerant recovery, recycling, and reclaiming; Lubricants, their properties and applications, including compatibility issues with various refrigerants. The course embraces safe handling, service, and installation of refrigeration equipment utilizing modern refrigerants. It also provides introduction to refrigerant management programs, certification schemes and relevant policies and regulations. The course is available in English language only.

UNEP Clients: [English](#) | ASHRAE Members: [English](#)

[ASHRAE UNEP PORTAL](#)



3. Reduction in surface climate change achieved by the 1987 Montreal Protocol

The benefits of the 1987 Montreal Protocol in reducing chlorofluorocarbon emissions, repairing the stratospheric ozone hole, shielding incoming UV radiation, reducing the incidence of skin cancer and mitigating negative ecosystem effects are all well documented.

Projected future climate impacts have also been described, mainly focused on a reduced impact of the mid-latitude jet as the ozone hole gradually repairs.

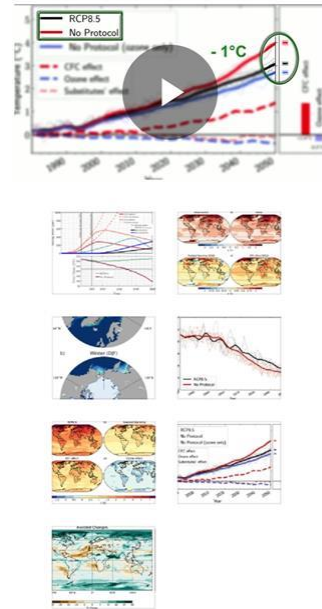
However, there is little appreciation of the surface warming that has been avoided as a result of the Montreal Protocol, despite CFCs being potent greenhouse gases. Instead, the issue of ozone depletion and climate change are often thought of as two distinct problems, even though both ozone and CFCs impact Earth's radiation budget.

Here we show that a substantial amount of warming has been avoided because of the Montreal Protocol, even after factoring in the surface cooling associated with stratospheric ozone depletion. As of today, as much as 1.1°C warming has been avoided over parts of the Arctic.

Future climate benefits are even stronger, with 3°C–4°C Arctic warming and ~1°C global average warming avoided by 2050; corresponding to a ~25% mitigation of global warming. The Montreal Protocol has thus not only been a major success in repairing the stratospheric ozone hole, it has also achieved substantial mitigation of anthropogenic climate change both today and into the future.

Authors: Rishav Goyal, Matthew H England, Alex Sen Gupta and Martin Jucker

[Environmental Research Letters, Volume 14, Number 12, 6 December 2019](#)



4. 2019 Global status report for buildings and construction

SUMMARY

Just released – 2019 Global Status Report for Buildings and Construction

Big step-up in ambition needed to put buildings and construction on track to meet Paris Agreement Goals

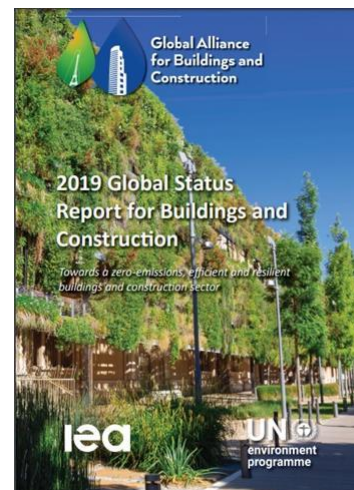
Buildings and construction generate nearly 40 per cent of CO₂ emissions, yet action continues to lag far behind opportunity.

With a window opening for enhanced Paris agreement plans, the sector will be key to unlocking higher climate action.

Dramatic improvements in the way the world's buildings are built, designed and operated are urgently needed if the vast, globally significant building and construction sector is to play its part in meeting international goals under the Paris Agreement.

The 2019 Global Status Report for Buildings and Construction released today by the Global Alliance for Buildings and Construction at COP25 in Madrid, shows that CO₂ emissions from the world's buildings and their construction remain stubbornly at around 39 per cent of total carbon dioxide emissions.

The report also underlines several worrying trends – overwhelming the many positive ones also featured – that governments need to address now to get on track to meet targets by 2030 and beyond. Indeed, without action, energy demands for this sector could rise by 50 per cent by 2060.



The report underlines that we're not on track. Without serious and sustained action these rising energy demands from this vital sector mean we cannot achieve the urgently needed climate transition or the sustainable development goals.

Emissions on the Rise

Last year's 2018 assessment indicated that governments, organizations and companies were making progress and that overall emissions may have peaked. These improvements were linked with energy efficiency gains in areas such as heating, lighting and cooking, supported by more businesses and homes being powered by cleaner forms of energy such as wind and solar.

But today's Global Status Report shows that while emissions are again rising, activities to address emissions are stalling. This mirrors the trends in overall emissions globally, which climbed to record levels in 2018. This rise in emissions is driven in large part by increased energy demands, including for energy intensive industries like steel, and thus the burning of more fossil fuels for power generation, such as coal.

Slowdown in Energy Efficiency Investments

The 2019 Global Status Report for Buildings and Construction also highlights a 'slow-down' and persistent under-investment in the energy efficiency measures urgently needed to lower emissions and set the stage for the decarbonization of the sector.

Soaring Space Cooling Cause for Concern

The report points out positive trends in some areas, including the penetration of efficient lighting systems like LEDs; improved windows and insulation systems; a more than 20 per cent increase in the use of renewables to power buildings since 2010 and declines in the use of energy for heating.

However, floor space has grown world-wide by 23 per cent since 2010, and by three per cent since 2017, while energy consumption in buildings has grown by seven per cent since 2010 and by one per cent since 2017.

An area of particular concern is the surge in 'space cooling' through rising ownership and use of air conditioning units, which has more than tripled since 2010 and has grown by three per cent since 2017. Air conditioners use electricity, mostly generated from fossil fuels, but they have a twofold effect, as they also typically use coolant chemicals (CFC and HCFCs), also powerful greenhouse gases if released.

Efforts are being made under the Kigali Amendment to the Montreal Protocol to promote more efficient air conditioners that also use coolants with 'low global warming potential'

With the highest growth of new buildings happening in developing countries – many of which are in warmer regions of the world – experts also point to the critical importance of effective, locally-inspired passive cooling building designs and urban form, as well as nature-based solutions like urban forests, green roofs and facades that reduce the need for electric cooling systems in the first place. [...]

[Global Alliance for Buildings and Construction, 11 December 2019](#)

Asia Pacific

5. Maldives and Sri Lanka upgrade RAC skills through the Refrigerant Driving License (RDL) Programme

In late November and mid-December 2019, both the Maldives and Sri Lanka, in cooperation with UNEP OzonAction and the Air-Conditioning, Heating and Refrigerating Institute (AHRI), advanced the Refrigerant Driving License (RDL) program by conducting technicians training sessions under the pilot stage of the RDL program targeting 31 local technicians who were trained and tested against RDL minimum requirements of competencies and skills. The pilot stage of RDL started in June 2019 in six countries: Grenada, Maldives, Rwanda, Sri Lanka, Suriname and Trinidad & Tobago where the Train-the-Trainers' sessions successfully certified 20 local Master Trainers in the six (6) countries. These Master Trainers will conduct additional training



sessions for local technicians during the pilot stage with supervision from the RDL Secretariat i.e. UNEP OzonAction and AHRI.

Maldives and Sri Lanka became the first two countries worldwide to train and test local field technicians in accordance with the RDL program. The two sessions were successfully organized at the Polytechnique Institute of Maldives between 26-28 November, and at the Sri Lanka-Korea National Vocational Training Institute between 16-18 December. Both sites are well-equipped and highly regarded at the market level. They are also affiliated with the local vocational training authorities.



Left side; Participants to the RDL session in Maldives (26-28 Nov).



Right side; local technicians during the practical test of RDL

The RDL program arises from the need for a responsible and safe transition to next generation refrigerants. The RDL is a refrigerant management qualification program jointly developed by AHRI and UNEP OzonAction and supported by key international industry associations. The RDL sets minimum competencies and skills for the HVAC&R (Heating, Ventilating, Air Conditioning and refrigeration) servicing network (individuals and companies) and creates an internationally recognised program through industry and governments. The program will be an important tool for technician training, education, and benchmarking of essential competencies and skills required for the proper and safe handling of refrigerants. This, in turn, will support the completion of the phase-out of HCFCs and enable a smooth start to the beginning of the HFC phase-down in Article 5 countries, as stipulated by the Kigali Amendment to the Montreal Protocol.

The RDL initiative was launched as a concept by UNEP and AHRI at the 37th OEWG meeting in July 2015. Since then, AHRI and UNEP have promoted the RDL amongst key HVAC&R associations while holding meetings in the margins of relevant industry events. Subsequently, an RDL Advisory Committee was established consisting of key industry associations that support the RDL including ABRVA, ACAIRE, AREA, AREMA, EPEE, JRAIA, the Alliance for Responsible Atmospheric Policy, and ASHRAE.



Left side: Participants to the training session in Sri Lanka (16-18 Dec 2019)



Right side: Local technicians in Sri Lanka practicing recovery skill before taking the RDL exam

Between 2016 and 2018, AHRI and UNEP worked in consultation with the RDL Advisory Committee, to review and analyse the existing globally recognised certification programs, to explore the qualification categories and agree on the operational modality of the RDL. After thorough analysis and in-depth consultation, the RDL Advisory Committee adopted four categories for the start-up of RDL (as per the table below) with a specific definition for each category. Currently, only the category of “RDL for Small Applications**” is being piloted. Once completed, other categories will be developed and examined as well.

Competency Requirements	(A) Small Applications	(B) Commercial Refrigeration	(C) Commercial Air-Conditioning
Basic Knowledge (Environment, Refrigerants classifications/types, applications and relevant policies)	X	X	X
Handling, transportation, storage and management of refrigerants’ containers	X	X	X
Servicing skills of leak detection, R&R, evacuation, charging and system tightness	X	X	X
Logging and Record Keeping		X	X
Tools and equipment for the job	X	X	X

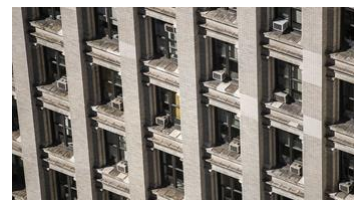
*The definition of the “RDL Category (A) Small Applications”, which is being piloted, is: Air conditioners and heat pumps with less than a 20kW/65kBtu/h cooling capacity and, Refrigeration equipment with less than a 6kW/20kBtu/h cooling capacity. (Examples: Packaged AC, ductless mini-split AC, multi-capacity AC, heat pumps, refrigerators, dehumidifiers, display cases, coolers and other unitary and hybrid equipment)

Contact: [Ayman El-Talouny](#), Coordinator International Partnerships, UNEP OzonAction Programme
[UNEP OzonAction Programme, December 2019](#)

Europe & Central Asia

6. En pleine expansion, la climatisation pose un défi majeur

Les gaz réfrigérants qui équipent les climatiseurs comptent parmi les gaz à effet de serre les plus puissants. A la COP25, la ministre de la Transition écologique Elisabeth Borne a rappelé que la France s'est engagée à réduire l'impact climatique de ce secteur en forte croissance dans le monde.



C'est un cercle vicieux. Avec le réchauffement climatique, partout dans le monde, les climatiseurs se vendent comme des petits pains. Et, ce n'est qu'un début, il pourrait s'en écouler dix par seconde sur les trente prochaines années, Inde et Chine en tête. Mais les gaz qui les équipent, les hydrofluorocarbones (HFC), qu'on trouve également dans nombre de réfrigérateurs sur le globe, comptent parmi les gaz à effet de serre les plus puissants.

Ces super-polluants ont remplacé leurs cousins les CFC qui « trouaient » la couche d'ozone. S'ils restent moins longtemps dans l'atmosphère que le dioxyde de carbone (CO₂) - quinze ans en moyenne -, ils ont un pouvoir de réchauffement global très élevé, jusqu'à 14.800 fois plus que le CO₂, selon le Programme des nations unies pour l'environnement (Unep).

Réduire le réchauffement de 0,4°C

[à] la COP25 qui a [eu] lieu à Madrid, la ministre de la Transition écologique et solidaire Elisabeth Borne a

rappelé que la France s'était engagée à réduire l'impact climatique de « ce secteur en forte croissance ». Une volonté déjà mise en avant par Emmanuel Macron lors du G7 à Biarritz en août dernier.

Les climatiseurs sont « un défi majeur pour le climat », résume la ministre, qui a appelé à mettre en oeuvre l'amendement de Kigali, entré en vigueur le 1er janvier [2019]. Cet accord historique, qui fixe un calendrier pour réduire drastiquement la production et la consommation de HFC, a été signé par les 197 Etats membres de l'ONU fin 2016, près de trente ans après le Protocole de Montréal qui avait, lui, signé l'arrêt de mort des gaz endommageant la couche d'ozone. Mais, pour l'heure, moins de 90 pays l'ont ratifié.

L'amendement vise à éviter 0,4 degré Celsius du réchauffement climatique attendu d'ici à la fin du siècle en éliminant plus de 80 % des HFC au cours des trente prochaines années. Et si « la transition vers des fluides alternatifs, à impact climatique nul ou faible, [s'accompagne] d'une amélioration de l'efficacité énergétique des équipements, il est possible d'éviter jusqu'à 0,8°C de réchauffement », assure le ministère de la Transition écologique. En revanche, sans une intervention forte de la part de la communauté internationale, les hydrofluorocarbones pourraient être responsables de 9 % à 19 % des émissions de CO₂ d'ici à 2050.

Taxe HFC

Dans les pays riches, le glas des HFC a sonné depuis quelque temps, et du secteur automobile à l'agroalimentaire, des techniques de substitution existent et sont appliquées. Mais la mutation demeure plus délicate dans les états du Sud. Elisabeth Borne a indiqué que quinze pays s'étaient engagés aux côtés de la France à prendre « des mesures ambitieuses » pour contribuer à cette transition « vers des solutions plus sobres en énergie et plus respectueuses de l'environnement ». Pour accélérer les choses, la France, elle, a prévu de mettre en place une taxe sur les gaz réfrigérants HFC à partir du 1er janvier 2021.

[Les Echos, 13 décembre 2019, Par : Muryel Jacque](#)

7. Kyrgyzstan joins ozone-depleting substances movement agreement of The Eurasian Economic Union (EAEU)

President of Kyrgyzstan Sooronbai Jeenbekov on December 9, 2019 signed the law on ratification of the protocol on joining of Kyrgyzstan the Agreement on Movement of Ozone-Depleting Substances and their Products and Recording Ozone-Depleting Substances in Mutual Trade between the Member States of the Eurasian Economic Union dated May 29, 2015 and signed on August 12, 2016.

[AKIpress News Agency, 17 December 2019](#)



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 >>>](#)

North America

8. R-22 Refrigerant phaseout arrives in 2020 - The move to ban R-22 refrigerant is nearly complete. What happens next?



It is not news to anyone in the industry that come 2020, the R-22 refrigerant phaseout in the United States will be complete. What may be a bit less certain is what happens next, and how businesses can minimize the impact and reduce the risk of operational disruption. R-22 supplies are limited, and prices could potentially increase significantly. Still, the cost of the R-22 components is hard to anticipate and could trigger full replacement of the majority of existing RTUs (rooftop HVAC units).

R-22 Refrigerant In order to fully appreciate the challenges that lie ahead, we must first look back. In 1987, the Montreal Protocol, a United Nations treaty, was signed by 24 countries and by the European Economic Community. Since then, nearly every nation on earth has ratified the treaty. It was originally an agreement to reduce the manufacture, import, export, and consumption of substances that deplete the ozone layer. Chlorofluorocarbons (CFCs) and halons were the first identified worst offenders. Then refrigerants known as hydrochlorofluorocarbons (HCFCs) were added, which included R-22, the world's most widely used refrigerant.

Commercial response to the R-22 phaseout. Since the U.S. Environmental Protection Agency (EPA) first mandated R-22 reductions in 2010, businesses have been grappling with the imminent final phaseout. The phaseout in the 1970s and 1980s, and the final ban of R-12 (R-22's cousin) in 1995, spiked the price of this ozone-depleting substance that had been standard in almost every automobile air conditioner. According to Alec Johnson¹, IT business analyst and owner of RefrigerantHQ.com, serious stockpiling of R-22 began in 2014-2015 in anticipation of a similar outcome, and prices rose steadily.

Consequently, after the 2015 phaseout milestone took effect, prices did indeed soar. So much, in fact, that by 2017, R-22 prices rose from around \$10 per pound to approximately \$23 per pound, or about \$700 for a 30-pound cylinder. Unexpectedly, however, the price dropped by half in 2018 to a mere \$350 per 30-pound cylinder, or about \$11.50 per pound. It has risen only slightly since then and is now selling for about \$400 per 30-pound cylinder, or a little over \$13 per pound. While still more expensive than its HFC replacement refrigerants, R-22 prices have leveled out but the availability of R-22 components is also creating new pressure on prices. Industry experts have suggested that, over time, servicing will become very expensive (even if the price of R-22 stays steady) because EPA requirements for handling controlled substances requires specialized education and certifications.

Impact on buildings. So, what does this coming ban mean for buildings? Replacement of HVAC units or refrigeration equipment involves huge capital expenditures. That's why Efficiency-as-a-Service providers work with customers to evaluate the risk to their real estate portfolios and design a strategic plan for proactively replacing units. This helps companies minimize the impact of emergency repairs and reduce the long-term maintenance costs across their real estate portfolio, both for equipment and labor.

For example, my firm, Redaptive, an energy efficiency services provider, worked with a customer with thousands of U.S. retail banking locations. They took stock of the age and condition of their buildings' RTUs and priority-ranked the riskiest assets. The analysis showed that 15% of RTUs were past expected useful life. Additionally, it turned out the vast majority, or 70%, of the units were still using R-22, presenting a significant liability for future maintenance expenses. The company replaced nearly 600 units across 300 facilities, reducing downtime by approximately 30%. As a result, the customer expects to save an estimated \$8 million on ongoing maintenance. As the final phaseout date looms, some organizations, like United Airlines², are also ramping up company-wide initiatives to replace air conditioning units.

Only time will tell how pricing and availability will shift with the R-22 ban. Those who proactively replace are likely to not only insulate themselves from potential risk, but will also reap the benefits of more efficient HVAC and lower energy bills. Here are three ways to prepare for the R-22 ban:

- 1- Conduct a comprehensive audit. Use the R-22 ban as an opportunity to conduct an audit of your assets and review of maintenance records to quantify the cost of maintaining older HVAC equipment.
- 2- Prioritize riskiest assets. Consider working with an energy efficiency partner; evaluate technologies/vendors to speed deployment.
- 3- Use this opportunity to monitor energy use going forward across the whole portfolio. Support your sustainability goals and OpEx reduction goals by not only upgrading equipment proactively, but also monitoring energy use across your portfolio to verify savings and identify other potential cost avoidance opportunities.

Facility Executive, 16 December 2019, By: John Schinter

9. Phasing out HCFC refrigerants to protect the ozone layer what you need to know when servicing or replacing an air conditioner in your home

Availability and Cost of R-22

R-22 is a refrigerant that is often used in airconditioning equipment. Because R-22 depletes the ozone layer, production and import was further limited in 2010.

In 2020, R-22 will no longer be produced or imported. After 2020, only recovered, recycled, or reclaimed supplies of R-22 will be available.

The production (not use) of R-22 is being phased out. You are not required to stop using R-22 air conditioners nor to replace existing equipment.

The phaseout period provides time to switch to ozone-friendly refrigerants when you normally would replace your air conditioner.

In the future, R-22 supplies will be more limited and costs to service equipment with R-22 may rise.

Servicing Systems with R-22

You may continue to have your equipment containing R-22 serviced.

The most important thing you can do is to maintain your unit properly. Appropriate servicing minimizes potential environmental damage and maintenance costs.

It is important to select a reliable service contractor. Technicians must have EPA Section 608 certification to service equipment containing R-22.

Request that service technicians locate and repair leaks instead of "topping off" leaking systems. This protects the ozone layer and saves you money by optimizing performance of your existing equipment.

It is illegal to intentionally release any refrigerant when making repairs. Technicians must use refrigerant recovery equipment during service.

The image contains several EPA informational graphics. At the top right is a poster titled "Phasing Out HCFC Refrigerants To Protect The Ozone Layer" with the EPA logo. Below it is a smaller graphic titled "What you need to know when servicing or replacing an air conditioner in your home" featuring an air conditioner unit. On the left side, there are two larger informational panels. The top one is titled "HCFCs and the Ozone Layer" and "Phaseout of R-22 and R142b". The bottom one is titled "What are HCFCs and R-22?", "Availability and Cost of R-22", "Buying a New Air Conditioner", "Servicing Systems with R-22", and "Alternative Refrigerants".

Buying a New Air Conditioner

EPA has prohibited the manufacture of new air-conditioning systems that use R-22.

Systems that use alternative refrigerants that do not harm the ozone layer are available and will become more common.

New energy efficient air conditioners save energy costs. Even if your air conditioner is only 10 years old, you may save significantly on your energy costs by replacing it with a newer, more efficient model.

Energy efficiency is measured by the seasonal energy efficiency ratio (SEER). The higher the ratio, the more efficient the equipment.

A central air-conditioner that has earned the ENERGY STAR® label is at least 14% more efficient than a standard new system and can save you money on your cooling bill.

ENERGY STAR® qualified systems are available for both R-22 and alternative (R-410A) systems.

Alternative Refrigerants

The most common alternative to R-22 is R-410A, a non-ozone-depleting HFC refrigerant blend.

R-410A is manufactured and sold under various trade names, including GENTRON AZ-20®, SUVA® 410A, and PURON®.

EPA reviews alternative refrigerants and maintains a list of acceptable substitutes for household and light commercial air conditioning.

It is illegal to intentionally release refrigerant substitutes when making repairs. Technicians must take efforts to avoid releases during service.

Phaseout of R-22 and R142b

HCFC-22 (also called R-22) and HCFC-142b are the next two HCFCs that the United States will phase out. The schedule to phase out HCFCs is:

January 1, 2010 Ban on production, import and use of HCFC-22 and HCFC-142b, except for continuing servicing needs of existing equipment

January 1, 2015 Ban on production, import, and use of all HCFCs, except for continuing servicing needs of refrigeration equipment

January 1, 2020 Ban on remaining production and import of HCFC-22 and HCFC-142b. After 2020, the servicing of systems with R-22 will rely on recycled or stockpiled quantities

January 1, 2030 Ban on remaining production and import of all HCFCs.

[United States Environmental Protection Agency \(US EPA\), December 2019](#)

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, 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 Venues

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

The factsheet cover features the UN Environment Programme logo and the title 'Article 7 Data Reporting on HFCs - When Countries Need to Start Reporting'. It includes a blue header with the UNEP logo and the title. The main content area has a white background with blue text. A large blue box with white text contains the key message: 'All countries that have ratified the Kigali Amendment before October 2019 will need to report 2019 HFC consumption and production data by 30 September 2020'. Below this, there is a photograph of a blue sky with white clouds. The bottom section is titled 'Ratification' and contains detailed text about the reporting requirements for countries that have ratified the Kigali Amendment before October 2019 and those that have not.

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

The factsheet cover features the UN Environment Programme logo and the title 'HS CODES FOR HFCs - ADVICE FOR COUNTRIES IN ADVANCE OF THE 2022 HS CODE UPDATE'. It includes a blue header with the UNEP logo and the title. The main content area has a white background with blue text. A large blue box with white text contains the key message: 'HS codes are covered by the single HS code 2903.39'. Below this, there is a photograph of a person working at a computer. The bottom section is titled 'HS Codes' and contains detailed text about the Harmonized System (HS) and the need for additional digits to identify specific HFCs. The bottom right corner features a photograph of a person working at a computer.

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:

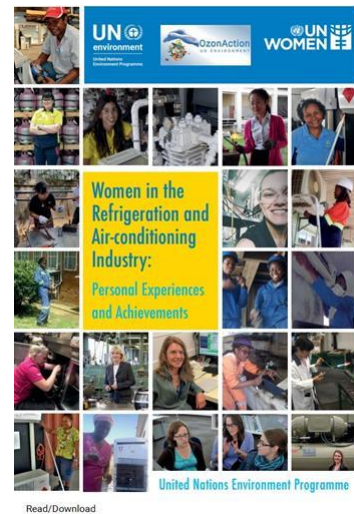
[W. Stephen Comstock](#), Manager of Business Development EMEA, ASHRAE
[Ayman Eltalouny](#), Coordinator International Partnerships, UN Environment OzonAction



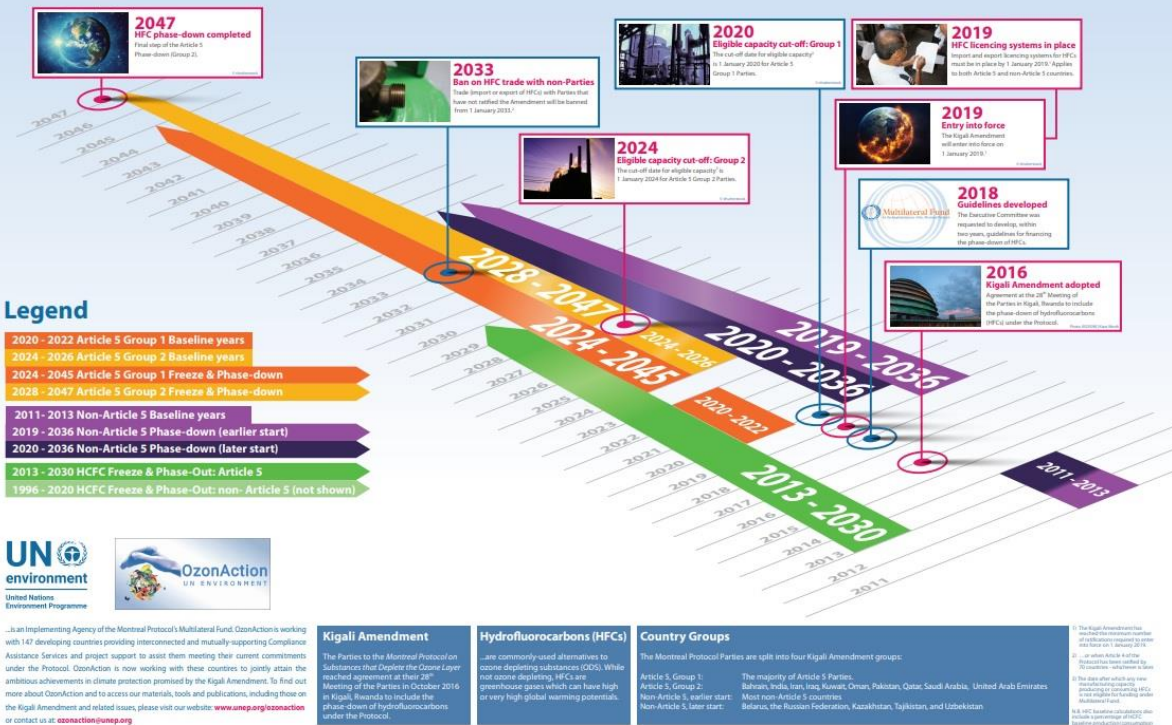
Women in the refrigeration and air-conditioning industry: Personal experiences and achievements

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 field and follow in their footsteps.

[Download the publication](#)



The Path from Kigali: HFC Phase-Down Timeline



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

New videos available on the OzonAction RAC video application

A series of new videos has just been released on the Refrigeration and Air-conditioning Technician Video Series application, with a focus on working with flammable refrigerants ...

50,000 downloads and counting!

To install, search for “RAC Video” in the Google Playstore or Apple IOS store, or scan the QR code.



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?”**



The Kigali Amendment to the Montreal Protocol - Opportunities and Next Steps - OzonAction Video

The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached agreement at their 28th Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs). The UN Environment, OzonAction developed a video to find out from renowned international scientific, health, technical, financial and national experts about

background and significance of this Kigali amendment.

The amendment presents many opportunities: improving the environment, refrigeration and air-conditioning systems and especially energy efficiency. It also presents new challenges. It is absolutely critical now for industry, governmental bodies and civil society to work together to adopt greener technologies in each country of the world and fight global warming.

[OzonAction YouTube](#) | See also: [United Nations Treaty Collection](#)

OzonAction Factsheets



UN Environment-ASHRAE Factsheet Update on New Refrigerants Designations and Safety Classifications

OzonAction Series of 19 Fact Sheets related to the Kigali Amendment.

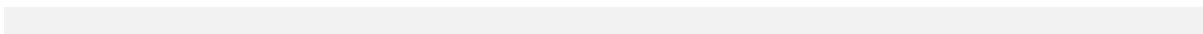
HS codes for HCFCs and certain other Ozone Depleting Substances ODS (post Kigali update).

The Kigali Amendment to the Montreal Protocol: HFC Phase-down - The phase-down of HFCs under the Montreal Protocol on Substances that Deplete the Ozone Layer has been under negotiation by the Parties since 2009 and the successful agreement on the Kigali Amendment at the 28th Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase-down hydrofluorocarbons (HFCs) continues the historic legacy of the Montreal Protocol. This factsheet summarises and highlights the main elements of the Amendment of particular interest to countries operating under Article 5 of the Protocol (Article 5 Parties).

Refrigerant Blends: Calculating Global Warming Potentials (post-Kigali update).

Global Warming Potential (GWP) of Refrigerants: Why are Particular Values Used? (post-Kigali update).

Tools Commonly used by Refrigeration and Air-Conditioning Technicians.





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](#).

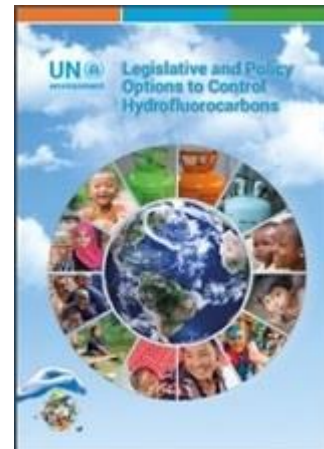
(Just search for "OzonAction", or scan this QR code)

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

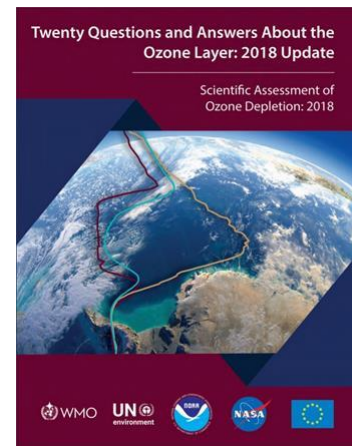
[Twenty questions and answers about the ozone layer: 2018 update](#), is a component of the Scientific Assessment of Ozone Depletion: 2018 report. The report is prepared quadrennially by the Scientific Assessment Panel (SAP) of the Montreal Protocol on Substances that Deplete the Ozone Layer.

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 CO₂-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, 2006-2018](#) 1994-2019 - 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 that more 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

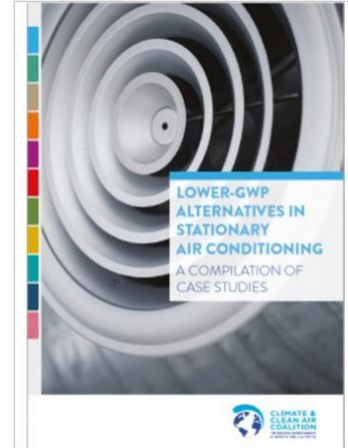


The Economist Intelligence Unit (EIU) newly launched report [The Cooling Imperative: Forecasting the size and source of future cooling demand](#) forecasts the size and source of future cooling demand out to 2030. Commissioned by the Kigali Cooling Efficiency Program (K-CEP), this report quantifies the 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, 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 -

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.
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- Easily export references, citations and abstracts.
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- 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

Climate friendly refrigeration in the Organic Food Retail / Small Store Sector - Last chance to participate in "Refrigerants, Naturally!" [online market survey](#) - **deadline extended until 18 December 2019**



Climate friendly refrigeration in the Organic Food Retail / Small Store Sector - Last chance to participate in our online market survey - deadline extended until 18 December!

If you have already filled in the Refrigerants, Naturally! for LIFE surveys, we would like to thank you very much for your contribution.

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The views expressed in articles written by external authors are solely the viewpoints of those authors and do not represent the policy or viewpoint of UNEP. While UNEP strives to avoid inclusion of misleading or inaccurate information, it is ultimately the responsibility of the reader to evaluate the accuracy of any news article in OzoNews. The citing of commercial technologies, products or services does not constitute endorsement of those items by UNEP.

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

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

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