



OzonAction

# OZONNEWS



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**Multilateral Fund**  
for the Implementation of the Montreal Protocol

A fortnightly electronic news update on ozone and climate protection and the implementation of the Montreal Protocol

## I am in the Montreal Protocol Who's Who...

### Why Aren't You?



The UN Environment, OzonAction, in collaboration with Marco Gonzalez and Stephen O. Andersen are updating and expanding the "Montreal Protocol Who's Who" as part of the celebration of the 30<sup>th</sup> Anniversary of the Montreal Protocol.

**The new website was launched during the 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol, Montreal, Canada, 20-24 November 2017.**

We are pleased to invite you to submit your nomination\*, and/or nominate an 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 men and women 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*

## GWP-ODP Calculator SmartPhone Application



The application allow you to easily convert ODP, CO<sub>2</sub>-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 CO<sub>2</sub>-equivalent tonnes (or kg) and display the corresponding converted values
- The app includes both single component substances and refrigerant blends
- The components of a mixture and their relative proportions (metric, ODP, CO<sub>2</sub>-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!



## 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



Now available for **free** in the **Google Play** and **Apple IOS Store**



Scan the QR code or search for “UNEP”, “OzonAction” or “WhatGas?”





# GLOBAL



## 1. 11<sup>th</sup> Meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer (COP 11) and 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (MOP 29), 20-24 November 2017, Montreal, Canada

The eleventh meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer (COP 11) and the twenty-ninth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (MOP 29) met from 20-24 November 2017, in Montreal, Canada. Over 420 participants from governments, UN agencies, intergovernmental and non-governmental organizations, academia, and industry attended the joint meeting.

The Preparatory Segment was supposed to meet from Monday through Wednesday, followed by the High-level Segment (HLS) on Thursday and

Friday. As the Preparatory Segment was unable to complete its work by Wednesday, it reconvened a number of times during the HLS.

MOP 29 adopted 10 substantive and 16 procedural decisions. Substantive decisions adopted include: essential-use exemptions and critical-use exemptions; future availability of halons; and energy efficiency. Procedural decisions adopted include: the budget; the Multilateral Fund (MLF) replenishment; membership of Montreal Protocol bodies; and a number of compliance-related decisions.

While most of the agenda items at COP 11/MOP 29 proved to be relatively uncontroversial, the MLF Replenishment Contact Group worked until close to midnight on Friday night before they could agree on a draft decision to be presented to plenary. Energy efficiency was another item that required much discussion, with a draft decision finally agreed on Friday evening. While these issues proved tricky to resolve, having done so means that parties have taken steps to ensure continued implementation of the Montreal Protocol, and have taken the first steps to implementing the Kigali Amendment, which has received sufficient ratifications to enter into force on 1 January 2019. [...]

### COP 11/MOP 29 Resources

- [COP 11/MOP 29 Website](#)
- [Ozone Secretariat Website](#)
- ▶ COP11/MOP-29 daily coverage by [IISD Reporting Services](#)

## 2. Kigali Amendment: Twenty Three Parties to the Montreal Protocol Have Ratified



Catherine McKenna, Canada's Minister of Environment and Climate Change, with delegates to the 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol from countries that had ratified the Kigali Amendment as of 23 November 2017. Photo Credit: Government of Canada

The Kigali Amendment to the Montreal Protocol will enter into force on 1 January 2019 after the threshold for the agreement to enter into force was met on 17 November 2017, when it was ratified by 20 parties.

Montreal Protocol parties continue to ratify the Amendment, which has

so far been ratified by 23 parties. The parties, listed alphabetically, are: Australia, Canada, Chile, Comoros, Côte d'Ivoire,

Democratic People's Republic of Korea, Finland, Germany, Lao People's Democratic Republic, Luxembourg, Malawi, Maldives, Mali, Marshall Islands, Micronesia (Federated States of), Norway, Palau, Rwanda, Slovakia, Sweden, Trinidad and Tobago, Tuvalu and the United Kingdom of Great Britain and Northern Ireland.

The Amendment was adopted by the 28<sup>th</sup> Meeting of the Parties to the Montreal Protocol on 15 October 2016 in Kigali, Rwanda. Under the Amendment, all countries will gradually phase down HFCs by more than 80 per cent over the next 30 years and replace them with more planet-friendly alternatives.

Developed countries will start reducing HFCs as early as 2019, while developing countries will start later. Phasing down HFCs under the Protocol is expected to avoid up to 0.5°C of global warming by the end of the century, while continuing to protect the ozone layer.

- ▶ All prior amendments and adjustments of the Montreal Protocol, which marks its 30th anniversary in 2017, have universal support. [Ozone Secretariat](#), UN Environment

### 3. Countries Commit US\$540 Million for Continued Work Under the Montreal Protocol on its 30<sup>th</sup> Anniversary



Developing countries are to receive US\$540 million under the Montreal Protocol to continue their work in phasing out ozone-depleting hydrochlorofluorocarbons (HCFCs) and to initiate enabling activities for the phase-down of climate-warming hydrofluorocarbons (HFCs) under the Kigali Amendment.

The funds will be provided by developed countries over the period 2018 to 2020 through the Multilateral Fund for the Implementation of the Montreal Protocol, which has disbursed over US\$3.7 billion since 1991 to support developing countries to phase out chemicals that destroy the ozone layer.

Montreal Protocol parties made the funding commitment during the joint 11th meeting of the Conference of the Parties to the Vienna Convention and the 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol held in Montreal from 20 to 24 November.

The parties also celebrated the 30<sup>th</sup> anniversary of the ozone-saving treaty during the meeting with high-level participants, including the former Prime Minister of Canada, Brian Mulroney.

Canada's Minister of Environment and Climate Change, Catherine McKenna, said, "The Montreal Protocol is an example of how we can come together, that we can do what naysayers think is impossible, that we can heal our planet."

#### Energy efficiency

The parties requested the Technology and Economic Assessment Panel of the Montreal Protocol (TEAP) to assess the technology options for enhancing energy efficiency of appliances and equipment in the refrigeration and air-conditioning sectors while phasing down HFCs under the Kigali Amendment.

The panel will also assess, among other issues, the challenges for the uptake of those technologies, their long-term sustainable performance and viability, their environmental benefits, and related costs.

The parties also agreed to hold a workshop on opportunities for enhancing energy efficiency while phasing down HFCs during their 40th Meeting of the Open-ended Working Group in July 2018.

#### Safety standards

The parties also requested for regular updates on the safety standards relevant to the use of flammable low-global warming potential alternatives to HFCs, in consultation with relevant standardization organizations.

This is crucial for ensuring the safe market introduction, manufacturing, operation, maintenance and handling of low-global-warming potential refrigerants that are used in many sectors.

### **Kigali Amendment**

The meeting also urged parties that have not yet ratified the Kigali Amendment to consider doing so in order to achieve the goals of the Amendment.

The Amendment, which has so far been ratified by 22 parties, is set to enter into force on 1 January 2019, requiring the nations of the world to gradually phase down HFCs by more than 80 per cent over the next 30 years and replace them with more planet-friendly alternatives.

Phasing down HFCs under the Protocol is expected to avoid up to 0.5°C of global warming by the end of the century, while continuing to protect the ozone layer.

"It is through the widest ratification of the Kigali Amendment that we will deliver on its promise of protecting our planet for future generations," said Tina Birmpili, head of the Ozone Secretariat.

### **Ozone monitoring and observation**

The parties also agreed on the need for increased support for research and systematic observations of the ozone layer, as it is through the observations that scientists can monitor the recovery of the ozone layer and the interaction between ozone and climate.

### **Ministerial roundtable**

The meeting also included a round table discussion by environment ministers from around the world moderated by UN Environment Champion of the Earth for 2016, Leyla Acaroglu, which focused on future opportunities and priorities under the Montreal Protocol.

The panelists were Khachik Hakobyan (Armenia), Catherine McKenna (Canada), Zoila González de Gutiérrez (Dominican Republic), C.K. Mishra (India), Meelis Münt (Estonia), Sydney Alexander Samuels Milson (Guatemala), Abdullah Ziyad (Maldives), Vincent Biruta (Rwanda) and Erik Solheim (UN Environment).

### **Science panel discussion**

In addition, a science panel discussion took place on the theme "[\*The scientific foundation of the Montreal Protocol: past, present, and future.\*](#)" Top scientists from various countries discussed the effect of the changing atmospheric composition on the ozone layer; ozone depletion and climate change; and observations and monitoring needs for ozone layer protection and recovery.

### **Ozone Awards**

The meeting also included an award ceremony to honour individuals, groups, organizations and parties that have demonstrated extraordinary commitment and contribution to the progress and achievements of the Montreal Protocol, especially in the last 10 years.

The awardees received trophies and artworks custom-made by various talented artists for the eight categories of the awards – political leadership, policy and implementation leadership, scientific leadership, technical leadership, exemplary project, partnership, youth creativity, and best media coverage.

All the 197 parties to the Montreal Protocol also received specially designed certificates in recognition of their tireless efforts, commitment, passion, and dedication to the protection of the ozone layer over the past 30 years.

The award ceremony closed with all participants singing along to a reggae tune by Grammy Awards nominee Rocky Dawuni to celebrate the 30 years of the Montreal Protocol. More information and photos from the Ozone Awards ceremony are available [here](#).

- ▶ Contact: [Dan Teng'o](#), Ozone Secretariat, UN Environment
- ▶ [Ozone Secretariat](#), UN Environment, 27 November 2017

**UN Environment, OzonAction is proud to announce that among the Ozone Award recipients, the following staff and partners received recognition:**

## Policy and implementation leadership:

Atul Bagai, former senior regional coordinator, South Asia

Artie Dubrie, former regional coordinator, Pacific Islands (award received by Joella Hayams)



## Partnership award:

American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) (award received by ASHRAE President Bjarne W. Olesen)



**OzonAction also received appreciation of the valuable work as an implementing agency.** Appreciation received by Dr. Shamila Nair-Bedouelle, Head OzonAction.

*Photo credit: W. Stephen Comstock*

[Ozone Awards 2017](#)- Ozone Secretariat, UN Environment

## 4. Executive Committee of the Multilateral Fund for the Implementation for the Montreal Protocol, Report of the Eightieth Meeting, Montreal, 13-17 November 2017

### Introduction

1. The 80<sup>th</sup> meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol was held at the premises of La Plaza Reception Hall, Montreal, Canada, from 13 to 17 November 2017.
2. The meeting was attended by representatives of the following countries, members of the Executive Committee in accordance with decision XXVIII/14 of the Twenty-Eighth Meeting of the Parties to the Montreal Protocol:

(a) Parties not operating under paragraph 1 of Article 5 of the Protocol: Australia, Austria (Chair), Belgium, Germany, Japan, Slovakia and the United States of America; and

(b) Parties operating under paragraph 1 of Article 5 of the Protocol: Argentina, Bosnia and Herzegovina, Cameroon, China, Lebanon (Vice-Chair), Mexico and Nigeria.

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) both as implementing agency and as 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 staff of the Ozone Secretariat, the Vice-President of the Implementation Committee and members of the Replenishment Task Force of the Technology and Economic Assessment Panel (TEAP) were also present.

5. Representatives of the Alliance for Responsible Atmospheric Policy, the Environmental Investigation Agency, the Institute for Governance and Sustainable Development, the Kigali Cooling Efficiency Program, the Lawrence Berkeley National Laboratory, the Natural Resources Defense Council, and the Refrigerant Gas Manufacturers' Association of India also attended as observers. [...]

▶ Read/download the [full report](#)

▶ The Multilateral Fund for the Implementation for the Montreal Protocol, [UNEP/OzL.Pro/ExCom/80/59 23](#) November 2017

## 5. OzonAction Side-Events at the 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol, Montreal, Canada, 20-24 November 2017

The Side Events at the 29<sup>th</sup> Meeting of the Parties were organised by UN Environment [OzonAction](#) in collaboration with other partners: ASHRAE, EPEE, and the Government of India.

These side-events were organized as part of UN Environment OzonAction clearinghouse services under the Article 10 of the Montreal Protocol. These covered the following themes: partnerships, new technological issues, scientific information and others.

- [Responsible Use of Refrigerants in Developing Economies Celebrating 10 Years of Partnership](#)

ASHRAE and UN Environment signed a cooperation agreement in 2007 aiming to achieve several environmental and technical goals within the mandate of both organisations including, but not limited to, the goals of reducing refrigerant emissions; maximising climate benefits in selecting alternative refrigerants, building the capacities of different HVAC&R stakeholders and facilitating the transfer and adoption of suitable technologies in developing countries.

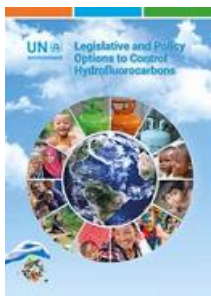
A decade of partnering between ASHRAE –UN Environment is translated into a success story that is easily demonstrated through a number of successful jointly developed events and products.. This cooperation has been strategically developed to best serve the needs of developing countries in terms of complying with the Montreal Protocol while advancing refrigeration & air-conditioning technologies and practices. The recent joint work plan for 2017-2018 is structured around the theme “Working beyond Low-GWP Refrigerants” which reflects the international movement to reduce dependency on high-GWP technologies, in particular with the adoption of the Kigali Amendment to the Montreal Protocol.

This session shed light on the joint efforts by ASHRAE and UN Environment to address the needs of developing economies in relation to sound management of refrigerants through production of state-of-art tools and products that can be used by NOUs and local stakeholders in capacity building and management programs of refrigerants.

- [Side-event: Launch of Publication: Legislative & Policy Options to Control Hydrofluorocarbons, Monday, 20 November 2017](#)



The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached an historic agreement on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs) according to an agreed schedule. To achieve this goal, the countries that belong to this multilateral environmental agreement should develop, enact and enforce different legislative and policy measures to facilitate a smooth HFC phase-down process.



This booklet provides developing countries with a suite of different options that they may wish to consider, including both mandatory and voluntary approaches. The options include monitoring and controlling trade (import quotas and exemption from quotas), mandatory reporting by HFC importers and exporters, as well as different types of bans and restrictions concerning HFCs and products and equipment containing or relying on HFCs. Other parts describe HFC use restrictions, record keeping on HFCs and HFC-containing products and equipment, HFC emission control measures and capacity-building and awareness-raising options. The options are not meant to be prescriptive but rather to provide a menu of options that countries may pick and choose from depending on their national circumstances.

This guide complements the previous OzonAction publication, HCFC Policy & Legislative Options: A Guide for Developing Countries (2010).

- [Side-event: Kuwait-Bahrain HFCs Outlook, Tuesday, 21 November, 2017 - Visualising Scenarios for Envisaging Actions](#)

Over the last few years, EPEE developed a special tool to analyse the European market response in relation to the application of the EU F-Gas regulation. The so called “GAPOMETER” turned out to be a very useful analytical model providing forecasts of future HFC demand in multi-national and multi-sectoral markets such as in Europe. The tool provided important insights into how a challenging HFC phase-down can be achieved. It attracted the attention of UN Environment and some A5 parties since being presented for the first time in margins of MOP-27.

Bahrain and Kuwait, while implementing the ODS Alternatives Survey projects, attempted to build forecasts for the HFCs consuming sectors, especially with the adoption of the Kigali Amendment. However, this turned out to be a quite complicated task given the diversity of applications in each subsector and the wider range of alternatives being offered, especially given the uncertainty about which and when an alternative would be available for high-ambient temperature (HAT) countries in the upcoming years.

The HFCs Outlook model is an attempt by Bahrain and Kuwait to build different realistic scenarios for the use of HFCs in conjunction with the phase-out of HCFCs, primarily over the next decade, for different type of uses and applications. The model that is built in cooperation with UN Environment and EPEE, went into the details of each market subsector in terms of collecting historical data for the bank of equipment over the last 20 years, building estimates of consumption and drawing different scenarios for technology selection over the next 10 years. The process, of building the comprehensive “HFC Outlook Model” required rigorous data collection and validation at country level and a significant amount of software development.

- [Side-event: India - An Integrated Approach to Cooling: Maximizing Climate Benefits under the Kigali Amendment, Thursday, 23 November 2017](#)



Cooling is an essential part for economic growth and the cooling demand is increasing in Article 5 countries. This will result in increased emissions both due to refrigerant and energy use. It is a widely known fact that about 90 % of the total emissions of RACHP equipment is because of energy consumption.

The Kigali Amendment to the Montreal Protocol for phase-down of Hydrofluorocarbons (HFC) has significant climate benefits and has for the first time provided an opportunity for maintaining and/or enhancing energy efficiency within the realm of the protocol.

Dovetailing maintaining and/or enhancing energy efficiency of RACHP equipment with refrigerant transition under HFC phasedown will enhance the overall climate benefit. Integrated actions have a higher impact than either of the actions taken in isolation. It is thus the need of the hour to have an integrated vision towards cooling encompassing *inter alia* reducing cooling demand, refrigerant transition, enhancing energy efficiency, and better technology options.

▶ UN Environment, [OzonAction Meeting Portal](#), November 2017



## 6. The Montreal Protocol: triumph by treaty

By Mario Molina, Nobel Prize Laureate in Chemistry and Durwood Zaelke, President, Institute for Governance and Sustainable Development

Ozone depletion was the first human threat to the global atmosphere to be recognized. It was also the first to be addressed by the international community. The results have been truly remarkable. The Montreal Protocol on Substances that Deplete the Ozone Layer, which celebrates its 30th anniversary this year, can claim to be one of the most successful international treaties ever struck.

It has fulfilled its original objective by putting the stratospheric ozone layer on the road to recovery. But its effects have not stopped there: it has also done more than any other measure to date to combat climate change. And it has achieved all this through a united, indeed unanimous, world community. The Montreal Protocol is the first and only treaty ever to have been ratified by every nation on Earth. This has happened not just once, but six times over, including the underlying framework convention, the protocol, and its four amendments.

The ozone layer is healing, and is likely to recover in several decades. But that is only part of the Protocol's impact.

In 1974, one of us (Mario Molina) and Sherwood Rowland published the results of a scientific study that concluded that chlorofluorocarbons – then widely used mainly as refrigerants and propellants – were migrating to the upper atmosphere and affecting the ozone layer which shields terrestrial life, including humans, from deadly ultraviolet radiation. If such depletion had continued there would have been catastrophic global consequences, with many millions of people contracting skin cancer and widespread damage to crops.

Many originally disputed our conclusion, but the science was later confirmed by strong experimental evidence. Consumers in Europe and North America acted quickly and boycotted the use of spray cans using chlorofluorocarbons as propellants for such products as deodorants and hair spray: at the time, every household, on average, used 15 spray cans. The chemical industry, which had initially questioned the science, began to develop replacement chemicals that were less harmful to the ozone layer. A handful of national laws were passed, and UN Environment brokered an international framework treaty, the Vienna Convention for the Protection of the Ozone Layer, in 1985.

Just months after the Convention was agreed, a scientific paper was published revealing a “hole” in the ozone layer above Antarctica so great that the scientists who found it originally thought their instruments must be faulty. The development of the Montreal Protocol to the Convention was further catalyzed by this unexpected discovery - similarly confirmed by measurements and scientific evidence that also found chlorofluorocarbons and related chemicals to be responsible.

The Protocol, also agreed under UN Environment's auspices, aimed at starting, then strengthening, protective action. Initially its parties agreed to cut chlorofluorocarbons by 50 per cent over 12 years, but they swiftly accelerated the reduction to 75 per cent by 1998, and then 100 per cent by 1992. Success has continued to breed success. Over its 30-year history, the treaty has succeeded in reducing nearly 100 ozone-depleting chemicals by nearly 100 per cent.

The Montreal Protocol's Kigali Amendment and associated energy efficiency efforts are at the leading edge of the triple-headed climate strategy that is needed to meet the Paris goals...

The ozone layer is healing, and is likely to recover in several decades. But that is only part of the Protocol's impact. The same chemicals that attacked the ozone layer are also greenhouse gases. So, phasing them out has made a great contribution to slowing global warming.

That contribution increased markedly last year when the nations that are party to the convention agreed in Kigali, Rwanda, to amend the Protocol to phase down the use of hydrofluorocarbons, which were introduced as ozone-friendly alternatives to damaging chemicals, but are also one of the six main sets of pollutants causing global warming. Their use has been growing rapidly and, molecule-for-molecule, they are up to 4,000 times more powerful than carbon dioxide in promoting climate change.

The phasedown will reduce use of the chemicals by 80 per cent, cut emissions equivalent to 80 billion tonnes or more of carbon dioxide by 2050, and avoid up to a half degree Celsius of warming by 2100. That is a significant contribution

to the goal of the 2015 Paris Agreement, to keep the increase in average world temperatures to well below two degrees Celsius, aiming for 1.5 degrees Celsius above their pre-industrial level, with no net emissions of greenhouse gases beyond mid-century.

The amendment was achieved after an eight-year campaign initiated by the Federated States of Micronesia, Mauritius, and Morocco. The amendment also eases the world's path away from fossil fuels by promoting improvement in the energy efficiency of the air conditioners, refrigerators, and other products switching out of HFCs. This would be perfectly practicable: when replacing other damaging refrigerants in the past, manufacturers achieved just such gains in efficiency.

Improvements in efficiency would also bring many other advantages, including reduced air pollution and improved public health. Consumers also would save money – and be better able to afford cooling – since energy use typically makes up 90 per cent of more of the lifecycle impacts of an air conditioner. National economies would also gain. Just a 30 per cent increase in the efficiency of India's units, for example, could save enough electricity to avoid having to build 140 medium sized plants to meet peak demand by 2030. In China, moving to climate-friendly refrigerants, and boosting the energy efficiency of cooling, could together save as much energy as would be produced by eight Three Gorges hydroelectric dams.

The Montreal Protocol's Kigali Amendment and associated energy efficiency efforts are at the leading edge of the triple-headed climate strategy that is needed to meet the Paris goals, as laid out in the recent report *Well Below 2 Degrees: Fast Action Policies to Protect People and the Planet from Extreme Climate Change*, published by the Committee to Prevent Extreme Climate Change, which we co-chair with Professor V. Ramanathan. This requires cutting both carbon dioxide and short-lived climate pollutants, including HFCs, black carbon, and methane, while also learning how to accelerate the removal of carbon dioxide already in the atmosphere.

We are rightly celebrating the achievements of the planet-saving Montreal Protocol this year. The most important tribute would be to redouble the efforts being made under it worldwide, including fast ratification and fast implementation of the Kigali Amendment, along with energy efficiency measures to double the climate benefits.

This article will be published in the December issue of [Our Planet](#).

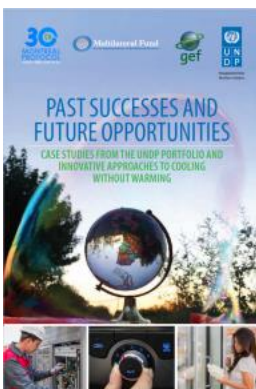
Pollution is the theme of the third [UN Environment Assembly](#), which is meeting in Nairobi from 4-6 December. [Sign the pledge](#) and help us #BeatPollution around the world.

The 11<sup>th</sup> Conference of the Parties to the Vienna Convention (COP 11) and the 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol (MOP 29), are meeting from 20-24 November in Montreal, Canada. More information is available [here](#).

Following ratification by the 20<sup>th</sup> party on 17 November 2017, the Kigali Amendment is [now due to enter force](#) on 1 January 2019.

▶ [Ozone Secretariat](#), UN Environment, 27 November 2017

## 7. Past Successes and Future Opportunities: Case studies from the UNDP portfolio and innovative approaches to cooling without warming the planet



**Summary** - The brochure, launched on the occasion of the 30<sup>th</sup> Anniversary of the Montreal Protocol covers examples of UNDP's work in protecting the global ozone layer, advancing sustainable cooling solutions for and tackling climate change, and highlighting linkages to the Sustainable Development Goals. Through the joint efforts of our project counterparts in recipient countries, as well as close coordination with MLF and GEF Secretariats, UNDP's cumulative portfolio of 2,496 projects and sector programmes in 120 countries amounting to \$829.6 million has already eliminated 70,321 ODP tonnes per annum, generated cumulative climate benefits of 6.48 billion tonnes of CO<sub>2</sub> eq. emissions, and catalyzed innovative solutions for environment-friendly alternatives as this report shows.

Since 1991, UNDP's Montreal Protocol programme has proudly partnered with developing countries, supporting them to meet their obligations under the Protocol to protect and regenerate the ozone layer while improving energy efficiency. This report highlights select cases of this work, ranging from successful examples of technological innovation, to training and certification, as well as how South-South cooperation has helped advance this critical agenda.

▶ [UNDP](#), 22 November 2017



**CLIMATE &  
CLEAN AIR  
COALITION**  
TO REDUCE SHORT-LIVED  
CLIMATE POLLUTANTS

## 8. Fighting air pollution can help achieve global development and climate goals

Activities to reduce short-lived climate pollutants can help development according to a paper in Science and Climate Change by Coalition Scientific Advisory Panel members called 'Short-lived climate pollutant mitigation and the Sustainable Development Goals'

An [article](#) released today in Nature Climate Change shows how measures to reduce short-lived climate pollutants (SLCPs) can help countries simultaneously achieve their domestic priorities and international commitments to the Sustainable Development Goals (SDGs) and the Paris Climate Agreement.

Short-lived climate pollutants, which include methane, black carbon, tropospheric ozone, and hydrofluorocarbons (HFCs), are powerful climate forcers and some are also dangerous air pollutants that significantly contribute to premature death and chronic illness globally, while also harming the environment. Their short lifespan in the atmosphere (from weeks to decades) means actions to reduce them provide quick results for air quality, the climate, and development.

Reducing short-lived climate pollutants globally could avoid as much as 0.6°C of additional warming by 2050, contributing directly to [Sustainable Development Goal \(SDG\) 13](#) on mitigating climate change. In combination with rapid decarbonization of the global economy, fast action on SLCPs provides the best chance of keeping global temperatures well-below 2°C.

Measures that address methane and black carbon also benefit [SDG 3](#) on good health by improving indoor and outdoor air quality. Methane measures also support [SDG 2](#) on zero hunger by improving agricultural production as a result of reduced tropospheric ozone. Reducing HFC emissions can also support SDG 2 by improving the efficiency of refrigeration.

“Faced with the imperative of achieving climate change and development goals within resource constraints, countries are looking for strategies that minimize potential trade-offs and conflicts while maximizing synergies,” said lead author Professor Andy Haines, from the London School of Hygiene & Tropical Medicine. “Many short-lived climate pollutant mitigation measures provide multiple near-term SDG benefits, which can generate an appetite for even greater action.”

In one specific example, the authors describe how providing affordable, clean household energy can improve household incomes ([SDG 1.1](#)) educational outcomes ([SDG 4](#)), access to modern energy ([SDG 7.1](#)), physical security and opportunities for women ([SDG 5.2 & 5.5](#)) and contribute to the development of sustainable cities and housing ([SDG 11.1 & 11.6](#)). At the same time clean household energy technologies reduce exposure to household air pollution ([SDG 3.2, 3.4 & 3.9](#)), and contribute to reduced climate warming ([SDG 13](#)), and deforestation ([SDG 15](#)).

“Governments have committed to achieving climate change mitigation goals, and they’ve committed to SDGs, but there’s often limited awareness of how those two are really linked.” said co-author and Professor of Climate Sciences at Duke University, Drew Shindell. “The pathway that we take to achieve our long-term targets must pass through our near-term goals, and in this context action to address short-lived climate pollutants are critically important.”

The paper comes at a particularly important moment as, global Environment Ministers gather in Nairobi, Kenya next week for the [third UN Environment Assembly \(UNEA 3\)](#) under the overarching theme of stopping pollution. And next year countries will meet again for the 2018 [Talanoa Dialogue](#) (formerly known as the facilitative dialogue) to assess progress and raise ambition to achieve the long-term climate targets of the Paris Agreement.

“From a climate perspective, the global community only has two more chances to come together to find the common ambition necessary to achieve the long-term goals of the Paris Agreement, and those are the 2018 Talanoa Dialogue and the second round of Nationally Determined Contributions in 2020,” said Nathan Borgford-Parnell, co-author and Science Affairs Consultant with the Climate and Clean Air Coalition. “Additional specific efforts to reduce carbon emissions is critical, but what if, in 2018, the ambition the world is looking for isn’t only to be found in pledges to reduce carbon emissions? What if the extra ambition we’re all searching for is in the millions of lives saved by addressing air pollution?”

To capitalize on the inherent synergies between air pollution reduction and SDGs, it will be important to quantify the multiple benefits of short-lived climate pollutant mitigation policies, while addressing potential trade-offs. The Climate and Clean Air Coalition, through its [seven sectoral and four cross-cutting initiatives](#) is working to provide guidance and institutional support to develop and implement strategies to quickly reduce black carbon, methane and HFC emissions.

“The Coalition is working with countries to develop national plans for action that reduce short-lived climate pollutant emissions. Countries are interested in taking action because this promotes development,” said Johan Kuylenstierna, co-author and Policy Director of the Stockholm Environment Institute in York. “As part of this we are supporting countries with tools and methodologies that provide quantitative estimates of health, crop yield and climate benefits of mitigation.

Benefits that align with many SDGs. The [LEAP-IBC tool](#) that we are launching shortly at UNEA 3, is one such tool they are using to estimate emissions and benefits.”

► [CCAC Secretariat](#), 29 November 2017

## 9. EPA Strategises to Rid Ghana of Ozone Depletion Substances

The Environmental Protection Agency (EPA) is seeking the support of the Customs Division of the Ghana Revenue Authority (GRA) to rid the country of ozone depleting substances (ODS).



The move will enable the customs division to effectively monitor and prevent ODS from entering the country through its borders.

Some of the ODSs include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride, hydrobromofluorocarbons, chlorobromomethane, and methyl chloroform.

A sensitisation workshop was organised at the Peduase Valley Resort for customs officers to help them to be conversant with the use of a refrigerant identifier to improve the ODS qualitative monitoring and control capabilities.

Attended by senior customs officers at the various entry points in the country, the workshop also created a platform for interaction between officials from the EPA and the customs officers. They were taken through topics such as the “Ozone depletion phenomenon,” “International and national response,” “Licensing and permission procedures”, “climate change, causes and effects and linkages to ozone depletion”, and the “role of customs officers and other key stakeholders.”

Addressing the participants to officially open the workshop, the Executive Director of the EPA, Mr Peter Abum Sarkodie, recalled that Ghana became a party to the Vienna Convention for the Protection of the Ozone Layer in 1988. He said apart from that, Ghana was party to the 1989 Montreal Protocol on substances that deplete the ozone layer, “and subsequently signed all other related amendments namely; the London, Copenhagen, Montreal and Beijing amendments.”

Mr Sarkodie explained that the signing of those protocol and amendments signified that Ghana had committed itself to the process as well as the efforts of 197 countries globally to restore the depleted ozone layer. He said under the provisions of the protocol, the country had an obligation to control the consumption of all ozone depleting substances at the national level, “and to achieve this, the monitoring and control role of customs is key.”

The UNDP Deputy Country Director for Operations, Mr Mulugeta Abebe, explained that the Montreal Protocol was designed to reduce the production and consumption of ozone depleting substances to reduce their abundance in the atmosphere. He said this year marked the 30<sup>th</sup> anniversary of the protocol and since its ratification in 1989, “Ghana has been and continues to be a model implementer, a country that other African countries learn from in terms of implementation and innovative programmes.” He acknowledged the crucial role of the customs officers in the implementation, monitoring and control of ODSs in the country and pledged the continuous support in the implementation of trade controls of ODSs.

In a related development, the EPA with support from the UNDP, presented six refrigerant identifiers to the customs division for distribution and use at selected active customs border posts to enable customs officers to isolate bad refrigerants from good ones.

The refrigerants, valued at \$30,000, would be used by the customs officers to effectively monitor the various entrances into the country to prevent entry of ODSs.

The Assistant Commissioner of the Customs Division of the GRA, Mr Bob Senyallah, received the items and reaffirmed the commitment of the customs officers to play their roles effectively in ensuring that Ghana met the international standards and all her international obligations.

He said the refrigerants identifiers would help the Customs to be more effective in the monitoring and control of the kind of refrigerants that entered the country. Mr Senyallah thanked the EPA and the UNDP for the items and added that his division appreciated the donation. He also gave an assurance that with the sensitisation and the equipment, Ghana would live up to expectation.

► [Daily Graphic](#), 9 October 2017



## 10. Spain Warns of Critical Gas Shortage

The Spanish refrigeration association AEFYT has warned of a “critical” refrigerant shortage and appealed to the Spanish government to reduce the country’s tax on HFCs.

The association has warned that R404A and R507A could disappear next year as a result of the “abnormal situation” created by the European F-gas regulations.

“The situation, which is already serious at this time, will become critical soon,” said AEFYT president Roberto Solsona. “The increase in the cost of operations and the shortage of refrigerants affects key economic sectors such as the hotel and restaurant industry and food distribution, among others.”

Last week three of Germany’s leading air conditioning and refrigeration associations demanded meetings with its government over refrigerant shortages, warning of the potential for “a failure of refrigeration and air conditioning systems in the food trade, as well as in hospitals and blood banks.”

AEFYT maintains that the situation is exacerbated in Spain due to the imposition of a tax on HFCs. It has previously demanded a reduction in the tax, claiming that it has fuelled a black market and left the industry uncompetitive. It also lodged a complaint with the European Commission claiming that the Spanish government’s tax infringes free market principles. To alleviate the effects of these practices, AEFYT has proposed a cut in the current HFC tax and a reduction in the price of recovered refrigerant – which is currently set at 85% of the tax imposed on virgin refrigerant – to 50% of the tax rate.

The association claims the allocation of quotas has caused an “anomalous scenario” regarding the availability of refrigerant gases in the market. “This situation will be worsened in 2018,” it says “when the European market shares will experience a new cut of 37% until the end of 2020.”

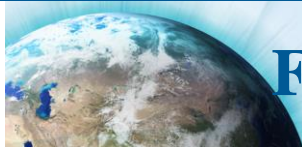
As a result, the AEFYT says it is detecting an increase in “legal and technical irregularities” such as in the “uncontrolled and inadequate” reuse of refrigerants from dismantled facilities and almost no destruction, recycling or regeneration of refrigerants.

“AEFYT and other European associations have long warned that, despite the efforts of the industry, the state of the art of technology is not in a position to meet legislative requirements and faces a possible shortage,” the association says in a statement.

It maintains that not all refrigerants marketed today have a direct substitute of lower GWP. In addition, it argues, the uses and applications of the new “mildly flammable” A2L refrigerants are restricted.

In addition, AEFYT is detecting an increase in what it describes as legal and technical irregularities such as the “uncontrolled and inadequate” reuse of refrigerants from dismantled facilities and almost no destruction, recycling or regeneration of refrigerants. “This results in a decrease in the energy efficiency of systems with the consequent increase in indirect CO<sub>2</sub> emissions and possible safety problems,” it says.

▶ [CoolingPost](#), 29 Nov 2017, By: Neil Everitt



# FEATURED

## OZONE SECRETARIAT

- ▶ Vienna Convention and Montreal Protocol Meetings: A Primer - [Read/Download](#)
- ▶ [29<sup>th</sup> Meeting of the Parties to the Montreal Protocol](#)
- ▶ [28<sup>th</sup> Meeting of the Parties to the Montreal Protocol](#)
- ▶ Final text of the Kigali Amendment to the Montreal Protocol available in all the six official UN languages ([A](#) [C](#) [E](#) [F](#) [R](#) [S](#))
- ▶ OEWG 39: The 39<sup>th</sup> Session of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, preceded by the 58<sup>th</sup> meeting of the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, held on 9 July and a workshop on safety standards relevant to the use of low-GWP alternatives to HFCs, held on 10 July 2017.
  - [Draft report of the thirty-ninth meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer - Addendum](#)
  - [Draft report of the thirty-ninth meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer](#)
- ▶ Click [here](#) for further information.

– Browse through the Ozone Secretariat “[In Focus](#)” to learn about latest updates.

– Click [here](#) for Montreal Protocol Meetings Dates and Venues

**The UN Environment Assessment Panels** have been the pillars of the ozone protection regime since the very beginning of the implementation of the Montreal Protocol. Through provision of independent technical and scientific assessments and information, the Panels have helped the Parties reach informed decisions that have made the Montreal Protocol a world-recognized success.

UNEP initiated the process of setting up the assessment panels in 1988, pursuant to Article 6 of the Montreal Protocol, to assess the scientific issues of ozone depletion, environmental effects of ozone depletion, and the status of alternative substances and technologies and their economic implications.

Four panels, namely the panels for Scientific, Environmental Effects, Technology, and Economic Assessments were formally established and approved at the First Meeting of the Parties to the Montreal Protocol in 1989 where their first set of Terms of Reference were adopted. Shortly after the Second Meeting of the Parties in 1990, the Panels for Technical Assessment and the Panel for Economic Assessment were merged into one Panel called the Technology and Economic Assessment Panel (TEAP), which together with the Scientific Assessment Panel (SAP) and the Environmental Effects Assessment Panel (EEAP) make up the three assessment panels active today.

In accordance with Article 6 of the Montreal Protocol and subsequent decisions of the Parties, the three panels carry out a periodic assessment at least every 4 years. The first assessment reports were published in 1989 and since then major periodic assessments have been published by all three panels in 1991, 1994, 1998, 2002, 2006 and 2010. For each periodic assessment, the key findings of the panels are synthesized into a short report. The full SAP assessment report for 2014 was published in December 2014, while the EEAP assessment report for 2014 was published in January 2015.

### PROGRESS & QUADRENNIAL ASSESSMENT REPORTS

- [EEAP](#)
- [SAP](#)

### SYNTHESIS REPORTS

- [2014 assessments](#)
- [2010 assessments](#)

- [TEAP](#)

- [2006 assessments](#)

[Assessment Panels List of Meetings](#)

## THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL



- [Report and other Documents for the 80<sup>th</sup> meeting of the Executive Committee](#)
- [Agenda for the 80<sup>th</sup> meeting of the Executive Committee](#)
- [Report of the 79<sup>th</sup> meeting of the Executive Committee](#)

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## OZONACTION

UN Environment, [OzonAction](#) highlights



A tri-annual newsletter by UN Environment, OzonAction under the Multilateral Fund for the Implementation of the Montreal Protocol.



Issue #1



Issue #2





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

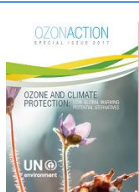
The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached agreement at their 28<sup>th</sup> Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs). The UN Environment, OzonAction developed a video to find out from renowned international 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](#)



**Ozone and Climate Protection: Low-Global Warming Potential Alternatives** - [OzonAction Special Issue 2017](#)

## OzonAction Factsheets:



[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 28<sup>th</sup> 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).



**OzonAction Factsheet:** [Refrigerant Blends: Calculating Global Warming Potentials](#) (post-Kigali update)



**OzonAction Factsheet:** [Global Warming Potential \(GWP\) of Refrigerants: Why are Particular Values Used?](#) (post-Kigali update).



**OzonAction Factsheet:** [Tools Commonly used by Refrigeration and Air-Conditioning Technicians](#)

Get the new **RAC Technician Video App**

Watch our short instructional videos on refrigeration & air-conditioning techniques, safety and best practices on your mobile device

Available in English, French, Spanish, and German

Download for free from Google Play Store & Apple Store/iTunes or scan this QR code

Available on the **App Store** and **ANDROID APP ON Google play**

**OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series** - 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. Additional videos will be added regularly.

Please share with your RAC associations, technicians and other interested stakeholders... **Over 11, 200 installations to date!**

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**OzonApp eDocs+** launched in Android Play Store and Apple Store. This new application launched by OzonAction on February 12, includes publications, videos, fact sheets and other awareness materials to help National Ozone Units (NOUs) and other stakeholders to build their capacity to implement the Montreal Protocol in a sustainable manner and at the same time to derive climate benefits. Now available in the [Android Play Store](#) and Apple Store/iTunes.



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

**OzonAction News Drops** - UNEP OzonAction is presenting a series of short video "News Drops" which focus on ozone layer protection, climate change and the importance of continuing ozone observations.



### Regional News Drops

The Regional Networks of National Ozone Units (NOUs) under the Multilateral Fund are a path-breaking mechanism for North-South and South-South cooperation. Networking provides a platform for NOUs from Article 5 countries to exchange experiences, develop their skills and tap the expertise of their peers in both developing and developed countries. Conducted at the regional level, the Networking activity builds the Ozone Officers' skills for implementing and managing their national ODS phase-out activities. During 2016 these videos were filmed at the regional network meetings around the world.

The NOUs were asked about their success stories, alternative refrigerants selected and their personal messages for national ozone celebrations...

Click [here](#) to access the News Drops

#### OzonAction Recent Publications:



**[Lower-GWP Alternatives in Commercial and Transport Refrigeration: An expanded compilation of propane, CO<sub>2</sub>, ammonia and HFO case studies](#)** - This booklet presents an expanded compilation of case studies on lower-GWP alternatives in commercial and transport refrigeration and provides an update to the first set of case studies which was published in 2014 by UNEP DTIE OzonAction/CCAC (Low GWP Alternatives in Commercial Refrigeration: Propane, CO<sub>2</sub> and HFO Case Studies).



**[NATIONAL CERTIFICATION SCHEMES FOR RAC SERVICING TECHNICIANS](#)** - This publication aims to provide introductory information for institutions in developing countries to better understand the issue of certification in the field of refrigeration and air conditioning, to assist in the creation of such certification and training schemes and to demonstrate to service technicians and enterprises why it is in their interest to participate.



**[THE MONTREAL PROTOCOL AND HUMAN HEALTH](#)** - This booklet summarizes how the successful implementation of the Montreal Protocol has protected human health. It describes how ozone depletion would have led to increases in UV radiation and, based on current understanding of the mechanisms by which UV affects biological processes, how that would have led to a dramatic increase in skin cancers, cataracts and affected human health in other ways. It also covers recent progress in understanding the 'World Avoided' – that is the world we would have lived in without a successful Montreal Protocol.



**[FINANCING THE CLIMATE CO-BENEFITS OF THE HCFC PHASE-OUT](#)** - A guide for Low Volume Consuming Countries - Hydrochlorofluorocarbons (HCFCs) are being phased out worldwide under the Montreal Protocol on Substances that Deplete the Ozone Layer. The Parties to this treaty encouraged countries to promote the selection of alternatives to HCFCs that minimise environmental impacts, in particular impacts on climate. The Protocol's Multilateral Fund encourages developing countries to explore potential financial incentives and opportunities for additional resources to maximise the environmental benefits from HCFC Phase out Management Plans (HPMPs). This booklet explains how Ozone Officers in low volume consuming countries can explore such opportunities for climate co-benefits. [English](#) | [French](#) | [Spanish](#)



**[SAFE USE OF HCFC ALTERNATIVES IN REFRIGERATION AND AIR CONDITIONING](#)** - An Overview for Developing Countries - Many of the alternative refrigerants to hydrochlorofluorocarbons (HCFCs) have particular characteristics in terms of toxicity, flammability and high pressure which are different from those used previously. It is therefore important that the refrigeration and air-conditioning industry adapts to both the technical and safety issues concerning these refrigerants. This publication provides an overview of the alternatives, their general characteristics and their application in the context of the safety issues. It provides guidance for National Ozone Units (NOUs) and other interested parties in developing countries on how they can advise and assist their national stakeholders in the selection and implementation of alternative refrigerants.



**[PHASING-OUT HCFCs IN SMALL AND MEDIUM-SIZED ENTERPRISES](#)** - This booklet aims to assist foam enterprises, especially SMEs, to better understand policies on HCFC phase-out, access to assistance from the Multilateral Fund for the Implementation of the Montreal Protocol and access alternative technologies in different foam applications taking into account challenges in converting to alternative technology. It also discusses some tips on how to identify enterprises that may use HCFCs and verify the HCFCs consumption of enterprises.



**INTERNATIONAL STANDARDS IN REFRIGERATION AND AIR-CONDITIONING** - This guide provides an introduction and simple overview of the issues related to international standards in the refrigeration and air-conditioning sector and how they can be useful in the context of the phase-out of hydrochlorofluorocarbons (HCFCs) in developing countries as required by the Montreal Protocol on Substances that Deplete the Ozone Layer.



## EVENTS

2017

**EUREKA<sup>2017</sup>**

**EUREKA 2017: Heating, Cooling & Ventilation: Sustainable technologies for a better life,**

11-12 December 2017, Berlin, Germany

2018



**The HVAC & Refrigeration Show,** 23 - 25 January 2018, London, United Kingdom

*A/Ccess* is the theme of the MACS 2018 Training Event and Trade Show to be held 14-18 February 2018, at the Caribe Royale Hotel and Convention Center, USA



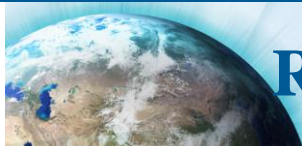
**AIRAH Refrigeration 2018,** 26 – 27 March 2018, Sydney, Australia



1<sup>st</sup> IIR International Conference on the Application of HFO Refrigerants  
2nd - 5th September 2018

**1<sup>st</sup> IIR International Conference on the Application of HFO Refrigerants.**

2-5 September 2018, Austin Court Conference Centre, Birmingham, United Kingdom



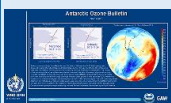
## READING



**Twenty Questions and Answers About the Ozone Layer,** presents complex science in a straightforward manner. It complements the **2014 Scientific Assessment Report of Ozone Depletion** by WMO and the U.N. Environment Programme.



**UNEP and USEPA: Promoting ozone and climate-friendly technologies in public procurement - a scoping study of Asia Pacific**



**WMO Antarctic Ozone 2016 Bulletins** - Containing information on the state of the ozone layer in the Antarctic at roughly two week intervals from August to November. The bulletins are based on data provided by WMO Members which operate ozone monitoring stations in the southern hemisphere and satellites to observe ozone globally.



The **EU F-Gas Regulation Handbook,** Keeping Ahead of the Curve as Europe Phases Down HFCs - a free online resource for climate media and other concerned parties, published by the London-based Environmental Investigation Agency (EIA).

[Alternative Refrigerant Evaluation for High-Ambient-Temperature Environments: R-22 and R-410A Alternatives for Mini-Split Air Conditioners](#)

[AREA Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants](#) - AREA has updated its Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants.

[Free guide to F-gas changes](#) The European contractors association AREA has produced a timely guide to the F-gas regulations which clarifies the new rules, their impact and their practical application...[Read more](#)

The recent [Alternatives to HCFCs/HFCs in developing countries](#) with a focus on high ambient temperatures" study carried out by Öko-Recherche for the European Commission stresses that the refrigerant and blowing agent demand is expected to triple by 2030 in developing countries as a result of economic growth. A sector by sector analysis shows that a climate-friendly replacement for current and future of HCFCs and high GWP HFCs is possible in most applications ...

[Primer on Hydrofluorocarbons](#), Fast action under the Montreal Protocol can limit growth of HFCs, prevent up to 100 billion tonnes of CO<sub>2</sub>-eq emissions by 2050, and avoid up to 0.5°C of warming by 2100. IGSD, January 2014, Lead authors: Durwood Zaelke, Nathan Borgford-Parnell, and Danielle Fest Grabiell. Contributing authors: Stephen O. Andersen, Xiaopu Sun, Dennis Clare, Yuzhe Peng Ling, and Alex Milgroom.

[Flammable Refrigerants Safety Guide](#), AIRAH - Many of the refrigerants traditionally used in refrigeration and air conditioning systems in Australia have been non-flammable, non-toxic, synthetic greenhouse gases (SGGs) that have a high global warming potential (GWP). These were typically synthetic refrigerants including CFCs, HCFCs and HFCs. Due to the growing national and international concern regarding the resulting atmospheric effects of SGGs, the use of alternative low GWP refrigerants is increasing. ...

[Recent Trends in Global Emissions of Hydrochlorofluorocarbons and Hydrofluorocarbons: Reflecting on the 2007 Adjustments to the Montreal Protocol](#). S. A. Montzka \*†, M. McFarland ‡, S. O. Andersen §, B. R. Miller †||, D. W. Fahey †, B. D. Hall †, L. Hu †||, C. Siso †||, and J. W. Elkins †† Earth System Research Laboratory, National Oceanic and Atmospheric Administration, Boulder, Colorado 80305, United States ‡ DuPont Chemicals & Fluoroproducts, Wilmington, Delaware 19805, United States § Institute for Governance & Sustainable Development, Washington, D.C. 20007, United States|| Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, United States.

[Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems](#)- ASHRAE

A first edition, the IIR guide "[CO<sub>2</sub> as a Refrigerant](#)" highlights the application of carbon dioxide in supermarkets, industrial freezers, refrigerated transport, and cold stores as well as ice rinks, chillers, air conditioning systems, data centers and heat pumps. This guide is for design and development engineers needing instruction and inspiration as well as non-technical experts seeking background information on a specific topic. Publication, IIR Technical Guide, 2014.

FREE [HVAC Optimisation Guide released](#) by AIRAH and the NSW Office of Environment & Heritage outlines 20 HVAC optimisation strategies and how they can be applied to the vast majority of commercial systems, both in older and modern buildings...



Industrial Refrigeration Equipment Market (Refrigeration systems, Coil and Condensers, Thermal panels and Parts) - Latin America Industr Analysis, Size, Share, Growth, Trends and Forecast 2013 - 2019



## [Latin America Industrial Refrigeration Equipment Market Benefits from Region Flourishing Food and Beverage Production and Processing Market – Trends and forecast 2013-2019.](#)

## [Solvents & Bio Solvents Market Outlook - Global Trends, Forecast, and Opportunity Assessment \(2014-2022\)](#)

## [Chlorofluorocarbon Market: Global Industry Analysis and Forecast 2015 to 2021](#)

[Getting The World Off the Chemical Treadmill: A per capita convergence framework for an ambitious phase-down of HFCs under the Montreal Protocol](#), By: Umang Jalan, Research Associate, Climate Change Programme, Centre for Science and Environment

[The Importance of Ambition in the 2016 HFC Phase-Down Agreement](#). Download the full report from EIA, [here](#)

[Update on the Illegal Trade in Ozone-Depleting Substances](#) – The Environmental Investigation Agency (EIA) briefing to the 38<sup>th</sup> meeting of the Open-Ended Working Group of Parties to the Montreal Protocol, in Vienna, Austria, from July 18-21, 2016.

[F-Gas Regulation shaking up the HVAC&R industry](#). Commissioned by the Greens in the European Parliament, the study provides qualitative and quantitative analysis of the early impacts of the EU F-Gas Regulation on the European industry and evaluates its influences on other countries and regions in designing their own policies to curb HFCs.

"[The Road to Competence in Future Green Technologies](#)", the International Special Issue 2016-2017 of Centro Studi Galileo. Read/Download [pdf version](#) | [E-book](#)

The [2016 editions of ASHRAE's major refrigerants-related standards](#) have been published as a package with 30 new refrigerants and refrigerant blends added.

[Quest for climate-friendly refrigerants finds complicated choices](#), National Institute of Standards and Technology (NIST), 17 February 2017, Summary: Researchers have just completed a multiyear study to identify the 'best' candidates for future use as air conditioning refrigerants that will have the lowest impact on the climate.

The second issue of [The Natural Voice magazine](#), entitled 'Mainstreaming Natural Refrigerants' showcases examples of installations using natural refrigerants around the world, including in the Gambia, Jordan, South Africa, China, Thailand, Tanzania and Saudi Arabia.

[Industria & Formazione, no. 2/17](#), Preview of the journal Industry & Training in refrigeration and air conditioning, technical refrigeration and air-conditioning, Centro Studi di Galileo # 406 Technological innovations in cooling and air conditioning with special focus on the F-Gas new regulations, new refrigerants, components and systems, food storage and cold sector. Vol. XLI - No. 2-2017.

Refrigeration: An increasingly strategic issue for data centres - [Cooling data centres: A major economic challenge](#) Today, data centres play a key role in many businesses as information technology is becoming an increasingly strategic factor. Cooling can present a major economic challenge for data centres. If cooling is implemented incorrectly or is inadequate, the amount of energy required to cool a data centre can equal or exceed that used to operate the equipment. Larger data centres can use a staggering amount of energy just to ensure the day-to-day running of electronic equipment. As a result, these data centres can produce a

great deal of heat, which require large-scale cooling systems in order to maintain efficient and continual operation... Browse through a selection of [articles and papers](#), by [iifir](#)

[shecco](#) GUIDE to Natural Refrigerants Training in Europe shows that training is readily available. [Read on r744](#)

[40 Years of Global Environmental Assessments: A Retrospective Analysis](#), J. Jabbour and C. Flachsland. Environmental Science & Policy

FactSheet - [Hazards during the Repair and Maintenance of Refrigeration Systems on Vessels](#).

[High-performance insulation materials market](#), June 2017

[EIA Applauds Bipartisan Effort to Tackle Super Pollutants, Including HFCs](#). Environmental Investigation Agency, 8 June 2017

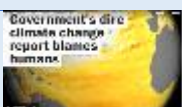
[The Environmental Investigation Agency \(EIA\)](#), recently launched report: [Chilling Facts VII](#) , [Chilling Facts I-VI](#) reports available [here](#)

ASHRAE Releases New Edition of [Principles of Heating, Ventilating and Air Conditioning](#). - Eighth edition of textbook updated based on the 2017 ASHRAE Handbook - The textbook is ASHRAE's recommended text for HVAC instruction and presents the fundamental concepts for HVAC systems and design.

[The Australian Institute of Refrigeration, Air Conditioning and Heating outlines the Future of HVAC in a Net-Zero World](#)

["Absorption Chillers Market: Global Industry Analysis and Forecast, 2017-2025,"](#)... The demand for thermally-driven chillers in multiple industrial verticals is poised to grow in the immediate future. Considering the rising demand for electrical chillers in commercial, residential as well as industrial settings, the adoption of absorption chillers will gain traction at considerable rate. By consuming lesser energy than conventional electrical chillers, absorption chillers will also garner surplus demand for not using ozone-depleting chlorofluorocarbons (CFC) for chilling purposes. Persistence Market Research's latest report delivers key insights for the future of global [absorption chillers market](#), excerpts from which highlight that by the end of 2025, more than US\$ 2 Bn worth of absorption chillers will be sold throughout the globe...

[Thousands of scientists issue bleak 'second notice' to humanity](#), The Washington Post, Speaking of Science, 13 November 2017, By: Sarah Kaplan





# MISCELLANEOUS



**[UNEA-3 Preparatory Meeting Opens in Nairobi](#)** - 29 November 2017: The third session of the Open-Ended Committee of Permanent Representatives to the UN Environment Programme (OECPR-3) is underway in Nairobi, Kenya, ahead of the third meeting of the UN Environment Assembly (UNEA-3). In addition to finalizing draft resolutions for adoption at UNEA-3, OECPR-3 will review progress in implementing previous UNEA decisions and consider items and proposals pertaining to the UNEA-3 ministerial outcome document and its theme, 'Towards a Pollution-Free Planet.'



**[UN knowledge platform launches live-tracking tools to review progress towards SDGs](#)**, UN Environment's dynamic online platform designed for sharing contextualized data...



New ***International Journal of Refrigeration*** service for IIR members - As of January 2017, not only will IIR members continue to receive the hard copy of the journal but IIR membership will now also give members access to 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:

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**[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](mailto:info@area-eur.be)



The Mobile Air Conditioning Society (MACS) Worldwide has released the **[MACS Mobile A/C Diagnostics app](#)** powered by Shiftmobility® for use on all mobile devices. The MACS app includes comprehensive mobile A/C and engine cooling system specifications for cars and light duty trucks from 1960-present; A library of heavy duty vehicle specifications donated by MACS member companies; access to MACS training calendar and website, archived MACS ***ACTION™*** magazines and ***Service Reports***, MACS mobile A/C diagnostic checklists and a MACS member supplier directory. The MACS app is available only to MACS members in good standing. Each membership will receive one free download; and additional member downloads are \$60 each annually. The MACS app can be downloaded from the Google play or iTunes store



US GreenChill Webinar: **[Supermarket Experiences Managing Refrigeration Systems in Small-Format Stores](#)**

Date: Tuesday, December 5, 2017 | Time: 2:00 pm to 3:00pm (Eastern time)

Description: Amber Hardy and Brad Birchfield from Aldi will discuss Aldi's experiences with natural refrigerants and what factors led the company to its current portfolio. They will also discuss Aldi's strategy for natural refrigerants, as well as the benefits and the obstacles. Ed Stanek, of ABC Refrigeration & Air Conditioning, and Jason Babin, of Hillphoenix, will also join as technical experts.



**To join the webinar:** 1. Visit the webinar access page: [Supermarket Experiences Managing Refrigeration Systems in Small-Format Stores](#). 2. Select "Enter as a Guest". It is important that you select the option to enter as a guest. 3. Enter your name. 4. Click "Enter Room". 5. Click "OK".

**For audio:** 1. Call the toll free call-in number: 1-866-299-3188 (706-758-1822 from outside the U.S.) 2. Use Conference Code: 202 343 9185#

**Bali volcano: NASA makes SHOCK warning - Mount Agung will cool ENTIRE PLANET** [...] "If these conditions are met, the eruption cools the surface/troposphere and warms the stratosphere, the opposite of both patterns associated with CO<sub>2</sub> increases. But both are very short-lived (~years)." Volcanoes emit carbon dioxide, which traps heat, but they also spray out ash particles and gases such as sulfur dioxide, which form compounds that reflect sunlight, and therefore cooling the planet [...]



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