



OzoNews

A fortnightly electronic news update on ozone and climate protection and the implementation of the Montreal Protocol brought to you by OzonAction

Volume XVIII

| 16 September 2018

Special Issue on the International Day for the Preservation of the Ozone Layer

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OzonAction wish you a successful celebration of the International Day for the Preservation of the Ozone Layer.

[OzonAction, International Ozone Day 2018](#)

1. UN Secretary General message for the International Ozone Day 2018



This has been a year of record-breaking heat around the world. It is also a pivotal time for climate action.

As we address this threat, we can draw inspiration from the Montreal Protocol, a shining example of how the world can come together for people and planet.

When science showed us that chlorofluorocarbons (CFCs) and other substances were tearing a hole in the ozone layer that protects all life on earth, the world responded with determination and foresight by banning them. Thanks to this global commitment, the ozone layer is expected to return to its 1980 levels by mid-century.

However, this work is not yet done.

The landmark Kigali Amendment, which enters into force on 1 January 2019, sets its sights on hydrofluorocarbons (HFCs), powerful climate-warming gases still used in cooling systems.

So far, 46 countries have ratified this new instrument; I call on all others to follow suit and show their commitment to a healthier planet. I expect countries to demonstrate significant progress in implementing the Kigali Amendment at the Climate Summit I am convening in September 2019.

For over three decades, the Montreal Protocol has done much more than shrink the ozone hole; it has shown us how environmental governance can respond to science, and how countries can come together to address a shared vulnerability.

I call for that same spirit of common cause and, especially, greater leadership as we strive to implement the Paris Agreement on climate change and mobilize the ambitious climate action we so urgently need at this time.

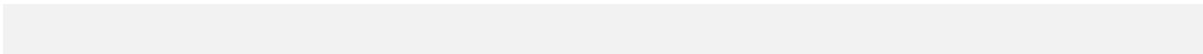
[The United Nations Environment Programme, September 2018](#)

2. UN Environment Executive director message for the International Ozone Day 2018

UN Environment Executive Director's Message for the International Ozone Day 2018.

Click image/link to [watch video](#)

[The United Nations Environment Programme, September 2018](#)



3. Let's carry on to achieve collectively our common goal: restoring the ozone layer

Message from Ms. Shamila Nair-Bedouelle, Head of OzonAction, UN Environment, Law Division, to the National Ozone Officers, on the occasion of the upcoming International day for the preservation of the ozone layer.

Dear National Ozone Officers,

The International Day for the Preservation of the Ozone Layer on 16 September is fast approaching, and you are likely pondering over suitable awareness activities for this important event. This year's theme and tagline is: Keep Cool and carry on! The Montreal Protocol. How can we interpret this theme and apply it? Certainly, we need to keep cool and protect ourselves from the harmful UV rays penetrating the vulnerable ozone layer, while at the same time we need to carry on in our efforts towards implementation of the Montreal Protocol.

At the Inter-Regional Thematic and Network meeting last January, you all clearly demonstrated your dedication and commitment towards the Montreal Protocol mandate. We urge you to carry on, relentlessly until we collectively achieve our common goal of restoring the stratospheric ozone layer to its original state for the betterment of our planet.

For Ozone Day events and awareness raising purposes please find below some OzonAction material/products/tools which you may use:

1. The Path from Kigali: HFC Phase-Down Timeline

This user-friendly poster produced by OzonAction will help to keep you on track of key HFC phase-down dates.

2. 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. The booklet is available in English, French, Russian and Spanish.

3. OzonAction Mobile Apps

The mobile apps are designed to build your capacity and ease your work in Montreal Protocol implementation. Download the mobile apps onto your smartphones and help others too!

4. Cold Chain Technology Briefs

The International Institute of Refrigeration partnered with UN Environment OzonAction to introduce a comprehensive set of Technology Briefs about the different Cold Chain sectors with the aim to assisting National Ozone Units (NOUs) and local stakeholders the different segments, technology trends and issues related to each sector.

5. Global Montreal Protocol Customs Enforcement Award

UN Environment OzonAction, in cooperation with the World Customs Organization and the Ozone Secretariat, launched the global Montreal Protocol award for customs and enforcement officers in January 2018. The award aims to provide recognition and encouragement to customs and enforcement officers and their respective organizations for successful prevention of illegal or unwanted trade of HCFCs / HFCs. This also includes equipment or products containing or relying on the use of HCFCs / HFCs. The deadline for submissions for this award is 31 December 2018.

6. Women in the Refrigeration and Air-conditioning Sector

OzonAction launched a global initiative to raise awareness of the opportunities available to women and to highlight the particular experiences and examples of women working in the refrigeration and air-conditioning



(RAC) sector, explaining their motivations, training and education, the challenges they may have faced, their experience and day-to-day details of their working lives and to recognise their successes. We encourage women working in the RAC sector in your respective regions to submit short 'stories'. The deadline for story submission has been extended to 6 September 2018.

7. Refrigerants Literacy e-Learning Course

The course is mainly designed for non-specialist in HVAC&R operation and servicing, i.e. NOUs, policy makers, procurement officers, buildings owners, facility managers, etc.

For more information on all the above, please visit the [2018 OzonAction Ozone day website](#). Also, in the right-hand column of this webpage you will find links to last year's Ozone Day webpage and to those of the previous years'. Please feel free to browse through them for useful information and ideas. If there is anything specific you require, please contact the nearest OzonAction CAP Regional Office.

We would appreciate very much to receive your Ozone Day planned activities/reports for posting on the OzonAction website. Please send this information through your respective regional OzonAction CAP office or to Ms [Jo Chona](#). Sharing such information is very encouraging, not only to us, but to the whole Montreal Protocol community.

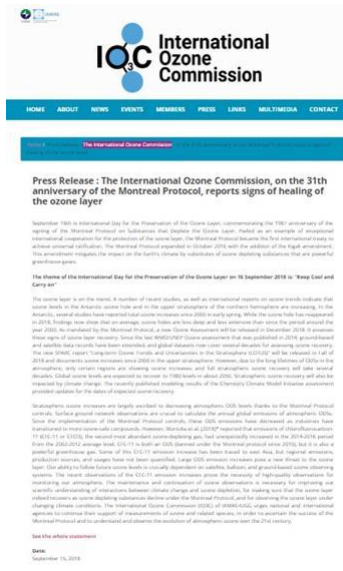
If you require assistance or any specific awareness material for your celebrations, please do not hesitate to contact me or your nearest regional OzonAction CAP office.

I wish to take this opportunity to thank you for your excellent work and look forward to our continued collaboration in protecting our environment.

Yours sincerely,

Shamila Nair-Bedouelle,
Head of OzonAction
UN Environment, Law Division

4. The International Ozone Commission, on the 31st anniversary of the Montreal Protocol, reports signs of healing of the ozone layer



September 16th is International Day for the Preservation of the Ozone Layer, commemorating the 1987 anniversary of the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. Hailed as an example of exceptional international cooperation for the protection of the ozone layer, the Montreal Protocol became the first international treaty to achieve universal ratification. The Montreal Protocol expanded in October 2016 with the addition of the Kigali amendment. This amendment mitigates the impact on the Earth's climate by substitutes of ozone depleting substances that are powerful greenhouse gases.

The theme of the International Day for the Preservation of the Ozone Layer on 16 September 2018 is: "Keep Cool and Carry on"

The ozone layer is on the mend. A number of recent studies, as well as international reports on ozone trends indicate that ozone levels in the Antarctic ozone hole and in the upper stratosphere of the northern hemisphere are increasing.

In the Antarctic, several studies have reported total ozone increases since 2000 in early spring. While the ozone hole has reappeared in 2018, findings now show that on average, ozone holes are less deep and less extensive than since the period around the year 2000.

As mandated by the Montreal Protocol, a new Ozone Assessment will be released in December 2018. It assesses these signs of ozone layer recovery. Since the last WMO/UNEP Ozone assessment that was published in 2014, ground-based and satellite data records have been extended, and global datasets now cover several decades for assessing ozone recovery. The new SPARC report "Long-term Ozone Trends and

Uncertainties in the Stratosphere (LOTUS)” will be released in Fall of 2018 and documents ozone increases since 2000 in the upper stratosphere. However, due to the long lifetimes of ODSs in the atmosphere, only certain regions are showing ozone increases, and full stratospheric ozone recovery will take several decades. Global ozone levels are expected to recover to 1980 levels in about 2050.

Stratospheric ozone recovery will also be impacted by climate change. The recently published modeling results of the Chemistry Climate Model Initiative assessment provided updates for the dates of expected ozone recovery.

Stratospheric ozone increases are largely ascribed to decreasing atmospheric ODS levels thanks to the Montreal Protocol controls. Surface ground network observations are crucial to calculate the annual global emissions of atmospheric ODSs. Since the implementation of the Montreal Protocol controls, these ODS emissions have decreased as industries have transitioned to more ozone-safe compounds.

However, Montzka et al. [2018]* reported that emissions of chlorofluorocarbon-11 (CFC-11 or CFC13), the second most abundant ozone-depleting gas, had unexpectedly increased in the 2014-2016 period from the 2002-2012 average level. CFC-11 is both an ODS (banned under the Montreal protocol since 2010), but it is also a powerful greenhouse gas. Some of this CFC-11 emission increase has been traced to east Asia, but regional emissions, production sources, and usages have not been quantified. Large ODS emission increases pose a new threat to the ozone layer.

Our ability to follow future ozone levels is crucially dependent on satellite, balloon, and ground-based ozone observing systems. The recent observations of the CFC-11 emission increases prove the necessity of high-quality observations for monitoring our atmosphere. The maintenance and continuation of ozone observations is necessary for improving our scientific understanding of interactions between climate change and ozone depletion, for making sure that the ozone layer indeed recovers as ozone depleting substances decline under the Montreal Protocol, and for observing the ozone layer under changing climate conditions. The International Ozone Commission (IO3C) of IAMS-IUGG urges national and international agencies to continue their support of measurements of ozone and related species, in order to ascertain the success of the Montreal Protocol and to understand and observe the evolution of atmospheric ozone over the 21st century.

*Montzka, S. A., G. S. Dutton, P. Yu, E. Ray, R. W. Portmann, J. S. Daniel, L. Kuijpers, B. D. Hall, D. Mondeel, C. Siso, J. D. Nance, M. Rigby, A. J. Manning, L. Hu, F. Moore, B. R. Miller, and J. W. Elkins (2018), An unexpected and persistent increase in global emissions of ozone-depleting CFC-11, *Nature*, 557, 413–417, doi:10.1038/s41586-018-0106-2.

[The International Ozone Commission, September 2018](#)

5. Be cool and save the ozone layer

Be cool and save the ozone layer, a new video on the occasion of the International Ozone Day 2018.

[UN Environment, Ozone Secretariat, September 2018](#)



6. Africa needs to cool down – urgently



As the world's warmest continent and home to six out of the 10 hottest places in the world, Africa needs cooling more than most.

We aren't just talking about the relief of an air-conditioned home on a sizzling summer day or the convenience of a cold drink from the refrigerator. In many cases, cooling is a matter of life and death.

According to a July 2018 report, *Chilling Prospects: Providing Sustainable Cooling for All*, globally, 1.1-billion people don't have cooling facilities and are considered at immediate risk. Nowhere is the problem more acute than in Africa, where 470-million people in rural areas don't have refrigeration to ensure food and medicines are safe, and 630-million people in crowded cities have little or no cooling to protect them against intensifying heatwaves.

African nations need to do more than just catch up, they must lead. On a warming planet, it won't be enough to simply adopt existing cooling technologies. African businesses and policymakers must set an example for the world in adopting sustainable policies and energy-efficient cooling technologies.

In 2016, African nations showed exactly this kind of leadership in supporting the Kigali Amendment to the Montreal Protocol — a global agreement to regulate substances used in cooling and heating that warm the planet.

In the 1980s, scientists proved that chlorofluorocarbons (CFCs) and other substances used in refrigeration and air conditioners were damaging the ozone layer and letting dangerous ultraviolet radiation flood through. Under the 1987 Montreal Protocol, nations slashed the use of these substances. The ozone layer is now healing and is on pace to return to 1980 levels by mid-century, with many associated benefits — including up to two million cases of skin cancer avoided annually by 2030.

By protecting the ozone layer, we have also greatly reduced the damage that UV-B radiation causes to plant species and ecosystems.

Since many ozone-depleting substances also warm our planet, the Montreal Protocol removed an estimated 135-billion tonnes of carbon-equivalent emissions between 1990 and 2010.

The Kigali Amendment now takes these measures to the next level by also tackling the realities of climate change. It addresses the critical question: How do we keep cool on a warming planet?

The climate threat in cooling comes from hydrofluorocarbons (HFCs), which replaced CFCs. Although ozone-friendly, HFCs are powerful climate warming gases. Nations that ratify the Kigali Amendment are committing to cutting the production and consumption of HFCs by more than 80% over the next 30 years and replacing them with environmentally friendly alternatives.

Their actions can avoid up to 0.5°C of global warming by the end of the century while continuing to protect the ozone layer. This will support the Paris Climate Agreement, which aims to limit global warming this century to less than 2°C compared with pre-industrial levels, with a more ambitious 1.5°C as a target.

African nations have been leaders on the Kigali process from the start. Beyond providing the namesake for the amendment, Rwanda was an early champion of the process, and its African Union partner, Mali, was the first country to ratify the subsequent amendment. To date, the Kigali Amendment boasts 44 ratifying countries, 11 African nations among them, and will enter into force on January 1 2019.

Economically, the Kigali Amendment creates new opportunities for Africa when it comes to sustainable refrigeration and air conditioning. By building partnerships, the Kigali Amendment will assist African countries to develop the technical know-how needed to prioritise sectors and technologies that do not use HFCs. The UN Environment Programme's Ozon Action is teaming up with the European Partnership for Energy and the Environment to develop pilot projects in Gabon, Mali and Senegal to get this process started.

HFCs aren't the only problem, though. Cooling needs power. If this power comes from fossil-fuel sources, it contributes to climate change, which in turn increases global temperatures and the need for cooling. Energy efficiency can help to reduce warming as the industry adjusts its technology to replace HFCs. African countries spearheaded efforts to ensure the Kigali Amendment would promote energy efficiency.

The simple fact is that we need cooling systems. But we also need to make sure that the price we pay for growth in the sector is sustainable. September 16 marks World Ozone Day, when everyone is urged to "keep cool and carry on" by celebrating the work so far, continuing to protect the ozone layer and accelerating action to curb climate change.

With leadership from African nations, the Kigali Amendment can help ensure equitable access to cooling for everybody without warming our planet further. And this, fundamentally, means saving lives.

Opinion by Tina Birmbili, executive secretary of the UN's ozone secretariat.

[Mail & Guardian, 12 September 2018](#)

Europe & Central Asia



7. The ozone hole is forming again

Video Release Copernicus (CAMS) on the International Day for the Preservation of the Ozone Layer, 16th of September 2018

Every winter, the ozone layer in the Earth's atmosphere is compromised by the forming of the ozone hole in the Antarctic region. Chemical substances are to blame: Halocarbons (CFCs, HCFCs and halons) were long used for a wide range of products from refrigerators to aerosol cans, triggering ozone depletion in the atmosphere. Even though these ozone depleting substances have been banned in most parts of the world since the 1990s, the ozone hole keeps forming every year. This endangers the climate situation of our planet, as it allows the entry of potentially harmful ultraviolet radiation.

The Copernicus Atmosphere Monitoring Service (CAMS), implemented by ECMWF, monitors and forecasts the amount of ozone in the atmosphere on a daily basis and keeps an eye on the annual formation of the ozone hole above the Antarctic.

On this year's International Day for the Preservation of the Ozone Layer on September 16th, CAMS will release an exclusive video which explains the role of the ozone layer, the formation of the ozone hole and reveals how atmospheric ozone is monitored to ensure the future wellbeing of our planet.

More information and graphics regarding the ozone hole available [here](#)

8. Protection de la couche d'ozone - Rapport annuel du Fonds Français pour l'Environnement Mondial

[...] Premier traité environnemental à atteindre la ratification universelle, le Protocole de Montréal est doté d'un Fonds multilatéral destiné à aider les pays en développement à atteindre dans les délais fixés les objectifs de réduction des produits chimiques réglementés par ce traité. 45 pays contribuent à ce Fonds, la France constituant le quatrième pays donateur le plus important après les États-Unis, le Japon et l'Allemagne.

De manière bilatérale, la France peut administrer jusqu'à 20% de sa contribution au Fonds, après approbation par le comité exécutif du Fonds des projets qu'elle soutient. Cette contribution bilatérale française est en partie gérée par le FFEM. La part bilatérale des contributions françaises a été mobilisée en 2017 pour poursuivre des activités liées à l'activité ozone notamment au Kenya, au Laos et en Tunisie.

Le Fonds multilatéral est abondé tous les trois ans depuis 1991. À la fin de l'année 2017, une nouvelle réunion des donateurs a permis de fixer les contributions budgétaires pour la période 2018-2020 à un total de US\$ 540 millions, dont US\$ 36,7 millions seront alloués par la France, un montant en augmentation par rapport à la période 2015-2017 (US\$ 34 millions). [...]

Extrait du Rapport Annuel 2017 du Fonds Français pour l'Environnement Mondial (FFEM), voir page 35.

[Fonds Français pour l'Environnement Mondial \(FFEM\), Rapport Annuel 2017](#)



9. French ecology minister resignation: A threat to the HFC tax?

French Ecology Minister Nicolas Hulot resigned on 28 August. How will this affect the future of France's proposed HFC tax?

Nicolas Hulot resigned from his position as France's minister for the ecological and inclusive transition on live radio on 28 August 2018. What impact will this have on France's proposed HFC tax?

Hulot, a former TV presenter and green activist, said he had resigned because he felt "on his own" in the government, and expressed his frustration with industrial lobbies.

In July 2017, Nicolas Hulot announced government plans to introduce a tax on HFCs. To come into effect according to schedule in January 2019, the tax must be approved by the National Assembly as part of the adoption of the 2019 Finance Bill.

Does Hulot's resignation compromise the future of the tax and its mechanism for supporting alternative technologies?

"The HFC tax project was an initiative carried personally by Mr. Nicolas Hulot. Following his resignation, the context is indeed likely to change," said a source at the Ministry of the Ecological Transition and Solidarity.



In an interview with French radio station Europe 1 on 28 August 2018, Matthieu Orphelin, a member of parliament (MP) from the ruling LRM party who had declared himself confident the HFC tax would be adopted during July's ATMOSphere France 2018 conference, said it was imperative "for everyone to get back together".

Orphelin expressed hope that Hulot's resignation would be an "electric shock" encouraging the parliamentary majority and all stakeholders, "to live up to what's at stake". Regarding the government's record, Orphelin is more nuanced than his former minister: "There are a lot of subjects where things have progressed," said the MP, citing in particular the carbon tax of which the HFC tax would be part.

Beyond the tax, it is important for the natural refrigerant industry to continue to support the implementation of the mechanism to support alternative technologies.

"This year, the F-Gas Regulation requires a very significant reduction [in the use of HFCs], and [HFC] prices have already grown up to tenfold in just one year. The price signal is therefore already much stronger than the amount of the proposed tax. European countries that had put in place an HFC tax before the entry into force of the EU F-Gas Regulation, however, did see a positive impact," Didier Coulomb, director-general of the International Institute of Refrigeration, told this website.

The adoption of this financial mechanism is therefore crucial to accelerating the market for natural refrigerants in France.

It remains to be seen whether France's new minister of the ecological and inclusive transition, François de Rugy, will 'live up to what's at stake'.

[r744, 5 September 2018, By: Marie Battesti](#)

Latin America and Caribbean

10. El plan que entrega incentivos para sustituir neveras nocivas al medioambiente

Uno de los factores que lesionan la capa de ozono son los gases refrigerantes que expulsan las neveras con más años de antigüedad y que aún son utilizadas por la población.

Para contrarrestar esta situación, el Ministerio del Medio Ambiente junto con la Asociación Nacional de Empresarios de Colombia, Andi, promueven actualmente la campaña 'Entrégala y Ahorra', a través de la cual buscan lograr en menos de cinco años la sustitución de más de un millón de neveras que tengan 10 o más años de uso, en los hogares de estratos 1, 2 y 3.

La campaña 'Entrégala y Ahorra' estimula a sustituir estas neveras otorgando un beneficio tributario a quienes opten por cambiar su viejo electrodoméstico.

En este sentido, explica Andrés Santana, ingeniero ambiental y director de la corporación Red Verde, "los usuarios van a poder tener una reducción del IVA de 14 puntos, esto significa van a pagar solo el 5 % de IVA en lugar del 19 %, cuando vuelvan a comprar su nevera nueva de uso doméstico", afirma.

Esta campaña hace parte del Programa Nacional de Sustitución de Neveras, a través del cual se logró aprobar en diciembre de 2017, el Decreto 2143, que establece el procedimiento para la aplicación de la llamada tarifa diferencial que permite pagar el 5% del IVA para la adquisición de neveras amigables con el medio ambiente.

El principal objetivo esta medida del IVA diferencial es promover la sustitución y entrega de más de un millón de neveras poco amigables con el planeta para que sean gestionadas de forma ambientalmente adecuada.



La sustitución de un refrigerador viejo por uno nuevo que sea amigable con el medio ambiente tendrá como resultado un ahorro anual de emisiones de 180 Kg de CO₂ y 3.58 toneladas de CO₂, equivalentes a los 20 años que puede durar en promedio una nevera en un hogar colombiano.

Esto significa que la reducción anual de emisiones debido a la sustitución de un refrigerador doméstico, equivaldría a evitar las emisiones de un automóvil compacto en un viaje de ida y vuelta de Bogotá a Medellín. Según el Ministerio del Medio Ambiente estos beneficios ecológicos de esta medida aportarán al cumplimiento de los compromisos de Colombia frente al Protocolo de Montreal y a la Conferencia 21 de las Naciones Unidas sobre el Cambio Climático, COP 21.

Gestión de neveras

El proceso de gestión ambiental consiste en que cada nevera, con 10 o más años de uso, que sea entregada por los usuarios, es llevada a las instalaciones de una empresa con licencia ambiental, especializada en el manejo de residuos de aparatos eléctricos y electrónicos.

Allí, se separan todos los materiales que son susceptibles de ser reciclados para convertirlos en materias primas. De igual forma, los elementos no aprovechables, como algunos gases refrigerantes, espumas de poliuretano y aceites, se extraen de manera segura y se les da un tratamiento adecuado, evitando que generen impactos negativos para el planeta.

Cómo acceder al beneficio

Quienes quieran obtener una reducción del IVA de 14 puntos, es decir, pagar solo el 5 % del IVA en la compra de su nevera nueva, deben cumplir con varios requisitos establecidos en la campaña 'Entrégala y Ahorra':

1. Pertener a un hogar de estrato 1, 2 o 3 y demostrarlo en el momento de la compra de la nevera nueva presentando un recibo de servicios públicos.
2. Entregar la nevera vieja de cualquier marca a uno de los fabricantes o a un tercero autorizado para actuar en su nombre, en este caso la corporación Red Verde, quien expedirá un certificado de recepción de la nevera usada.
3. Adquirir durante el 2018 una nevera que tenga un precio máximo de venta al público de 1.183.669 pesos, incluyendo el IVA, y que el electrodoméstico esté clasificado en los rangos de energía A, B o C que se encuentran en la etiqueta de eficiencia energética de cada refrigerador del mercado.

[El País, 9 Septiembre 2018](#)

North America

11. California legislature approves bill reducing super-polluting HFCs in major cooling systems

The California Legislature today approved the California Cooling Act, which will lead to the replacement of super-polluting hydrofluorocarbons with climate friendlier coolants in new refrigerators, air conditioners, and other products, and in supermarkets and other large buildings. The bill sent to Gov. Jerry Brown also will help keep in place federal standards phasing down harmful HFCs under challenge in Washington.

The following is a statement from David Doniger, Senior Strategic Director of the Climate & Clean Energy Program at the Natural Resources Defense Council:

"California is demonstrating, once again, commendable leadership in the fight against climate change. This bill will curb super-polluting HFCs in some of the largest refrigerating systems, and it fills a gap left by an adverse federal court decision that blocked Environmental Protection Agency rules to



phase down HFCs—a decision now on appeal to the Supreme Court. This smart move will help our climate, health and economy.”

[The Natural Resources Defense Council \(NRDC\), 30 August 2018](#)

12. Let's worry more about refrigerant leaks, less about metrics



[...] When [Joanna Turpin] first started writing about the HVACR industry more than 25 years ago, the term used to describe the harmful effects of refrigerant emissions in the atmosphere was ODP. After scientists discovered the hole in the ozone layer, they determined that it was caused by the chlorine in chemical compounds like CFCs, which were widely used in aerosols and refrigerants. They needed a measurement to describe the amount of ozone depletion caused by various substances, thus the term ODP was born.

Specifically, ODP is the measure of the impact on ozone of a chemical compared to the impact of a similar amount of R-11, which is a CFC. With its three atoms of chlorine per molecule, R-11 was used as the baseline, because it was considered to be the most harmful to the ozone layer; therefore, it was given the highest designation of 1 ODP. Other CFCs and HCFCs were given ODPs ranging from 0.01 to 1, depending on the amount of chlorine they contained. So, for example, R-22 — an HCFC — has only one chlorine atom per molecule, so its ODP is 0.05, which means its potential to destroy ozone was calculated to be 5 percent that of R-11.

ODPs were a very important measurement in the Montreal Protocol, the international treaty that led to the complete phaseout of CFCs and other ozone-depleting chemicals. With CFCs and HCFCs being phased out, HFC refrigerants were developed to take their place in air conditioning and refrigeration equipment. HFCs have zero ODP because they do not contain chlorine. However, scientists started becoming concerned that HFC emissions might be contributing to global warming, so the new GWP measurement was created.

GWP measures the total amount of energy that a gas absorbs over a particular period of time (usually 100 years) when compared to CO₂. CO₂ is used as the baseline and has the lowest designation of 1 GWP. The higher the GWP, the more likely it is to contribute to global warming. So, for example, the commonly used HFC refrigerant R-410A has a GWP of 2,088, which means it can cause 2,088 times as much global warming as an equal amount of CO₂ over 100 years.

Calculating GWP is nowhere near as straightforward as ODP, and I must admit that I don't entirely understand the methodology, as it involves concepts like “radiative forcing” and “pulse emissions,” combined with various “time horizons.” (For anyone interested in learning more about how GWP values were initially calculated, check out page 385 of the Intergovernmental Panel on Climate Change (IPCC) report, *Climate Change 2001: The Scientific Basis*.)

While the GWP values calculated by the IPCC are widely accepted in the HVACR industry and elsewhere, critics contend that they don't mean much. They cite the 100-year metric as being an arbitrary value and point to the IPCC's own statement in the aforementioned report that says, “Some of the GWPs have larger uncertainties than that of others, particularly for those gases where detailed laboratory data on lifetimes are not yet available ... The direct GWPs for those species whose lifetimes are well characterized are estimated to be accurate within ± 35 percent, but the indirect GWPs are less certain.”

Critics of GWP offer an alternative method that can be used to assess the potential harmful effects of refrigerant emissions on the environment — the global temperature change potential (GTP), which the IPCC defines as being the change in global mean surface temperature at a chosen point in time in response to an emission pulse relative to that of CO₂. This metric has its own critics, who say that the uncertainty in absolute GTP is ± 90 percent at 100 years.

It seems like there is still a lot of uncertainty surrounding the best way to calculate a refrigerant's potential harm to the environment. So I would like to make my own suggestion: Let's spend less time arguing over these types of metrics and more time on designing and installing air conditioning and refrigeration systems that don't leak in the first place.

13. Budgeting ozone-depleting emissions from coastal tidal marshes



Brackish wetlands and their salt-tolerant vegetation are significant methyl halide emitters. The natural emissions add chlorine and bromine to the stratosphere, which break down ozone.

Coastal wetlands have recently been lauded for their carbon sequestration capacity, but many also emit compounds with deleterious atmospheric effects. For example, brackish tidal marshes—where fresh and salt water mix—release significant amounts of methyl chloride and methyl bromide into the atmosphere. (Compounds derived from a methyl group and halogens, including methyl chloride and bromide, are collectively referred to as methyl halides.) Both compounds contribute to stratospheric ozone destruction because they carry substantial quantities of chlorine and bromine into the stratosphere, where they catalyze ozone loss reactions.

Tidal marshes are known to be terrestrial methyl halide hot spots. The estimated magnitude of their emissions is highly variable, however, and reported fluxes vary by 2 to 3 orders of magnitude. This uncertainty is one reason why the global methyl halide budgets remain out of balance, despite decades of research. A missing source exists, and it is not evident if tidal marshes can account for the imbalance.

To more accurately account for terrestrial methyl halide emissions, Deventer et al. conducted the first ecosystem-scale evaluation of these emissions from a tidal marsh. The researchers employed a nonintrusive technique known as relaxed eddy accumulation to measure the exchange of gases between the Suisun Marsh—the largest surviving tidal marsh in the San Francisco Estuary in California—and the atmosphere. The innovative method allowed the researchers to measure multiple ground cover types, including vegetation, bare soil, and open water. They also used static flux chambers and soil cores to monitor smaller spatial scales and more accurately estimate emissions from specific ground cover. The study spanned a 14-month period in 2016 and 2017.

The results show that the marsh is constantly emitting methyl chloride and methyl bromide throughout the year, but the emission rates varied seasonally. Warm summer months drove more emissions than cool winters, with the highest emissions occurring in June. The seasonality of the results suggests that methyl halide emissions track ambient air temperature and the vegetative growth cycle. A warming climate portends larger methyl halide releases, which may be accentuated during heat waves.

The small-scale measurements revealed that emissions were not equal across plant types. The invasive halophyte pepperweed (*Lepidium latifolium*) occupied large, densely packed patches across the marsh and belched more methyl halides into the atmosphere than its native neighbors. To date, pepperweed is the third-strongest emitting wetland species identified outside of the tropics. Its high invasion potential and recent rapid expansion could increase methyl halide emissions from salt-tolerant wetlands in the future.

Using previous estimates of total global tidal marsh area, the study authors statistically upscaled their results to project methyl halide emissions around the world. This numerical model estimates that tidal marshes contribute up to 1.3% and 5.0% of global methyl chloride and methyl bromide emissions, respectively.

The study indicates that, cumulatively, brackish marshes are minor sources of stratospheric chlorine but notable sources of stratospheric bromine. The novel experimental technique provides a framework for future emissions estimates and helps to reduce the variability of terrestrial methyl halide estimates.

[EOS, Earth & Space Science News, 6 September 2018, By: Aaron Sidder](#)

14. Reduction of 40% of carbon emissions - "green alternatives" for automobile conditioners cooling gases in the UAE



لغازات تبريد مكيفات السيارات "خفض 40 % من الانبعاثات الكربونية - "بدائل خضراء

في الإمارات

تحدياً بينياً جديداً على مستوى العالم، فعلى "الفريون" تعتبر الغازات المستخدمة لتبريد مكيفات السيارات، أو كما تعرف في الأوساط العلمية باسم غاز الصعيد المحلي، تنبأت بعض التقارير الجديدة بأن نسبة السيارات في الإمارات سوف ترتفع إلى قرابة 3 ملايين سيارة بحلول عام 2020، الأمر الذي يطرح العديد من التساؤلات حول حلول خضراء لتقليل نفثي هذه الغازات في الهواء لما لها من تأثير على رفع نسبة الأمراض والتحسسية، كما يمتد خطرها إلى تآكل طبقة الأوزون

وفي إطار تعزيز الاستدامة البيئية، توظف الإمارات جهودها بشكل دؤوب في تحويل لاقتصاد الوطني إلى اقتصاد أخضر، لتقليل نفثي هذا الغاز في الهواء، والبحث عن بدائل صديقة للبيئة من أهمها الاستراتيجية الوطنية للتنمية الخضراء، ضمن تضافر مؤسسي لتحقيق الاستدامة حيث تعمل على خفض الانبعاثات %الكربونية الناجمة عن المركبات بنسبة قد تصل إلى 40

[...]

[AlBayan, 2 September 2018, By: Mona Khalifeh](#)

Featured



OZONE SECRETARIAT

"Keep Cool and Carry On", Theme for World Ozone Day 2018

The theme is accompanied by the tagline: **The Montreal Protocol**

The theme for this year's World Ozone Day is a motivational rallying call urging all of us to carry on with the exemplary work of protecting the ozone layer and the climate under the Montreal Protocol.

The theme has two connotations – that our work of protecting the ozone layer also protects climate and that the Montreal Protocol is a “cool” treaty, as exemplified by its outstanding success.

Ozone Secretariat is inviting people to join in keeping our planet cool and celebrating the Montreal Protocol's success in protecting the ozone layer and its contribution to combating climate warming by phasing out nearly 100% of controlled ozone-depleting substances that are also potent global-warming gases.

The Montreal Protocol is poised to contribute even more to the fight against global warming through the Kigali Amendment, which will enter into force on 1 January 2019.

The theme and tagline of this year's World Ozone Day in all the six official UN languages are posted on our [website](#) for wider dissemination.

To support your World Ozone Day communication activities, the Secretariat has developed two posters in all the six official UN languages. Please download them from our [website](#) for dissemination in your commemorative activities.

As in previous years, the United Nations Secretary-General's message for World Ozone Day and other materials will be shared prior to the day for further dissemination.

UN Environment, [Ozone Secretariat](#), May 2018



- [40th Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol](#), 11-14 July 2018, Vienna, Austria

The documents for the forthcoming 40th meeting of the Open-ended Working Group of the Parties to the Montreal Protocol (11 to 14 July 2018, Vienna), and the associated workshop on energy efficiency opportunities while phasing-down hydrofluorocarbons (9 and 10 July 2018) are available on the meeting portal and mobile app.

Read/download OEWG40 [Summary](#)
[OEWG-40 Daily coverage by IISD](#)

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

[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

- [Adjusted Prorated 2018-2020 business plan of the Multilateral Fund \(16 August 2018\)](#)
- [81st meeting of the Executive Committee](#), Montreal, Canada, 18 to 22 June 2018
- [Reports of projects demonstrating alternatives to HCFC technologies \(updated 81st meeting\)](#)
- [2018 Executive Committee Primer](#)

[Learn more](#)



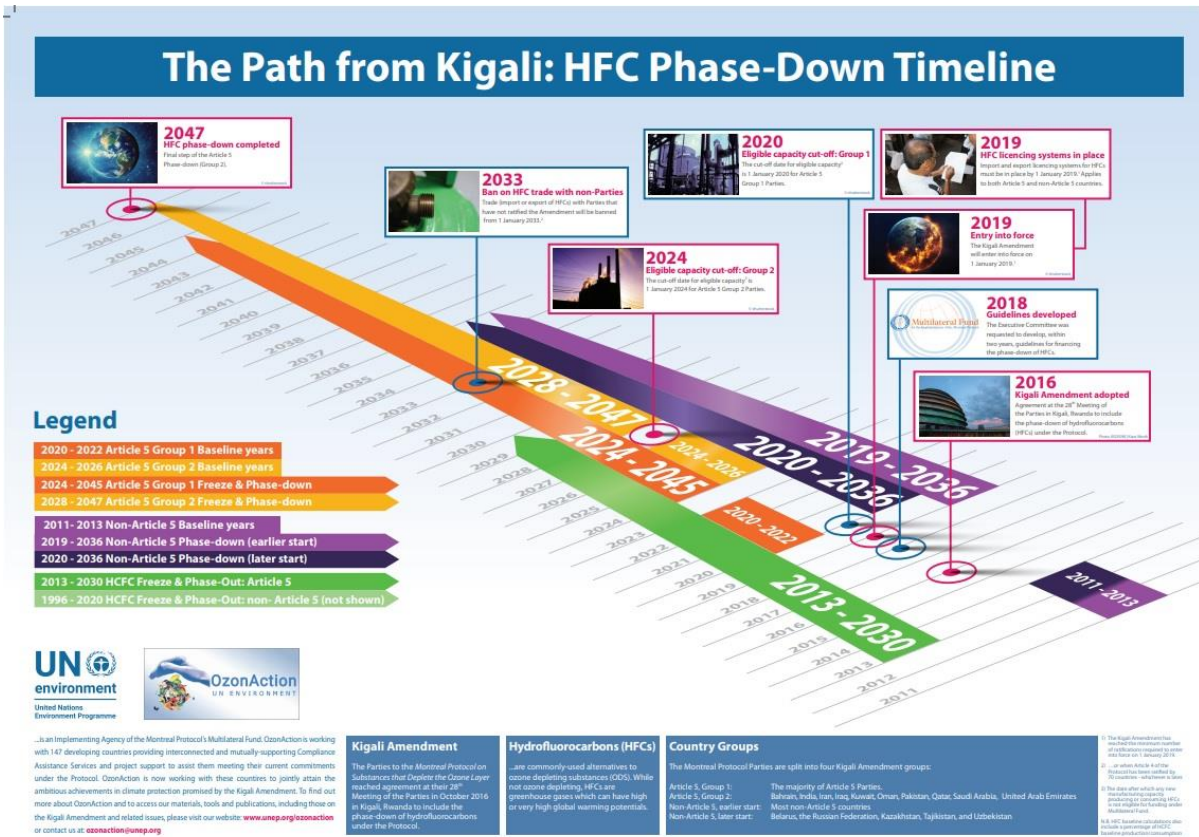
OZONACTION



To assist countries in planning and organising their **Ozone Day activities on 16 September**, OzonAction prepared a list of material which may be downloaded and used in raising awareness to the general public and to the Montreal Protocol family.

OzonAction is keen on highlighting your country's activities on the occasion of the **2018 International Ozone Day celebrations**. Please send us the related information/photos to [email](#).

Take this opportunity to share your innovative and inspiring events with the world!



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

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



NEW >>> UN Environment-ASHRAE Factsheet [Update on New Refrigerants Designations and Safety Classifications](#)

OzonAction Series of [19 Fact Sheets](#) related to the Kigali Amendment.

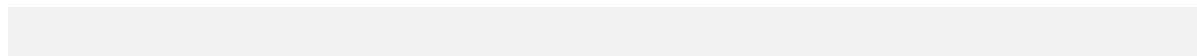
[HS codes for HCFCs and certain other Ozone Depleting Substances ODS](#) (post Kigali update).

[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 hydrofluoro-carbons (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 - 50,000 download 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.

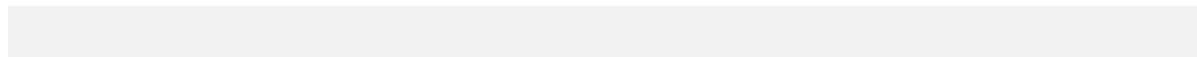
This application, consisting of short instructional videos on techniques, safety and best practice, serves as a complementary training tool for refrigeration and air-conditioning (RAC) sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training.

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)





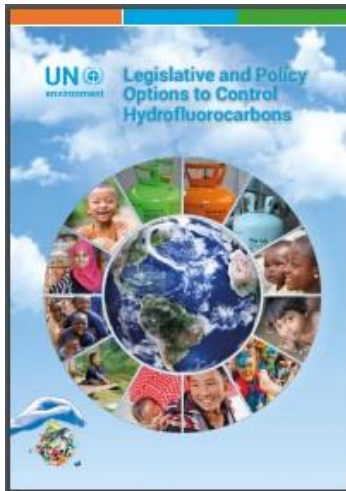
OzonApp eDocs+ launched in Android Play Store and Apple Store.

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.

OzonApp eDocs+ 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.

Events

2018

- [8th International Conference on Magnetic Refrigeration at Room Temperature \(Thermag VIII\)](#), 16-20 September 2018, Darmstadt, Germany
- [FREE Natural Refrigerant Workshop - Mapping the Future of Refrigerants](#). Join the NASRC and Efficiency Vermont for a FREE workshop that will provide an in-depth overview of natural refrigerant options and how the industry's "mega-trends" will influence those options in new and existing stores. 3 October 2018, 9AM - 5PM / Burlington, Vermont. Register [here](#)
- [Healthcare ColDays](#), 15 November 2018, Lyon, France,

See other [IIR upcoming events](#)

2019

[25th IIR International Congress of Refrigeration](#) - From August 24-30, 2019, Montreal (Canada), birthplace of the 1987 Montreal Protocol, will host the 25th IIR International Congress of Refrigeration – ICR 2019.

The international meeting will provide, among others, the ideal platform to take stock of the historic Kigali Amendment to the Montreal Protocol, which will enter into force in January 2019, bringing about a global phase-down of hydrofluorocarbons (HFCs).

Covering all fields of refrigeration, ICR 2019 is expected to surpass the success of previous congresses, and will be a unique opportunity for researchers and engineers from all over the world to meet, exchange and publish the results of their research. With nearly 1,000 abstracts received, the 25th event in the series is set to welcome its largest audience to date.

The congress will be organised under the theme "Refrigeration for Human Health and Future Prosperity" and will focus on the current global issues at the centre of international concern, including food security, health, energy saving and energy efficiency, the reduction of global warming and the protection of the ozone layer.

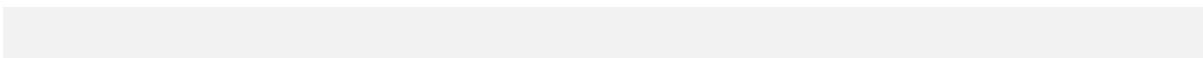
Click [here](#) for more information / [International Institute of Refrigeration](#)

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.

Lead Author:
 Michaela I. Hegglin
 Coauthors:
 David W. Fahey, Mack McFarland, Stephen A. Montzka, Eric R. Nash



[Primer on Hydrofluorocarbons \(HFCs\)](#) - IGSD -11 January 2018

Summary:
 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.

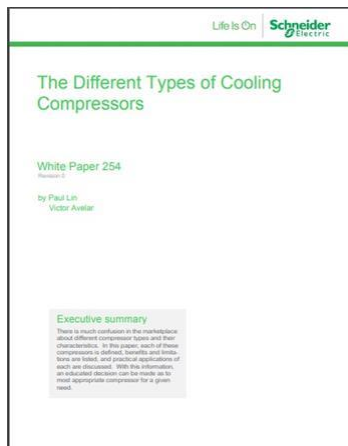


The [IIR International Dictionary of Refrigeration](#) Available in 11 languages, the complete version of the International Institute of Refrigeration (IIR) International Dictionary of Refrigeration is now freely accessible online. The IIR International Dictionary of Refrigeration offers researchers,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



"The Different Types of Cooling Compressors", A new free-to-download white paper launched by Schneider Electric.

Introduction: There is much confusion in the marketplace about different compressor types and their characteristics. In this paper, each of these compressors is defined, benefits and limitations are listed, and practical applications of each are discussed.

With this information, an educated decision can be made as to most appropriate compressor for a given need.

Conclusion: Various compressor types are appropriate for different uses, and no single compressor type is ideal for all applications. The intent of this paper is to contrast the benefits and limitations of the various compressor types on the market today.

Significant differences in compressor designs offer theoretical and practical benefits for different purposes. Nevertheless, the compressor is just one of four basic components of an air conditioner. The compressor type, cooling

system configuration (e.g. condenser, evaporator), control, etc. will determine the ultimate performance achieved in a particular application.

For more information on the types of cooling systems, see *White Paper 59*, [The Different Technologies for Cooling Data Centers](#).

Miscellaneous



I am in the Montreal Protocol Who's Who... Why Aren't You?

The United Nations Environment, OzoneAction, in collaboration with Marco Gonzalez and Stephen O. Andersen are updating and expanding the "Montreal Protocol Who's Who" as part of the 30th Anniversary of the Montreal Protocol celebration.

The new website was launched during the 29th 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 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



New International Journal of Refrigeration service for IIR members -

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

- Immediate and permanent access to the latest research and to IJR archive
- Access the latest articles as soon as they become available online.
- Browse, search and read each one of the nearly 4,500 papers since Volume 1, Issue 1.
- Unlimited access to seminal contributions to the field of refrigeration dating back to 1978.
- Keep up-to-date with subscriptions to customized e-alerts on New Volumes,

Topics and saved Searches.

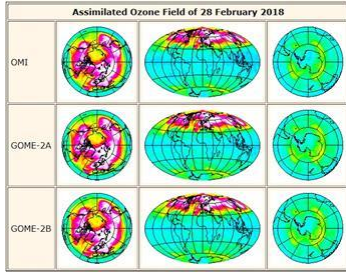
Enhanced content and functions

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- 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



[TEMIS -- Near-real time global ozone field](#). The in near-real time delivered total ozone columns, derived from satellite observations, are input to a data assimilation program which provides global ozone fields for today and a forecast for the coming days.



[The International Institute of Refrigeration supports World Refrigeration Day](#) - As the only independent intergovernmental organisation in the field of refrigeration, the International Institute of Refrigeration (IIR) joins associations and companies worldwide to support the initiative of an official World Refrigeration Day on 26 June every year. The annual World Refrigeration Day, to be launched on 26 June 2019, aims to raise awareness among the wider public about the importance of refrigeration technologies in everyday life.

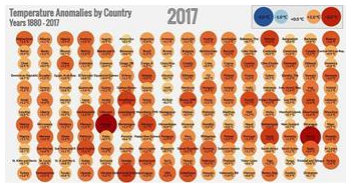
Refrigeration is essentially a question of temperature and, as such, it only seems natural to celebrate the field on the birthday of the pioneer at the origin of the international unit of temperature, Lord Kelvin (Sir William Thomson) – born 26 June 1824.

With increasing global stakes at hand, over the past years refrigeration has come to take a leading role at the heart of international affairs.

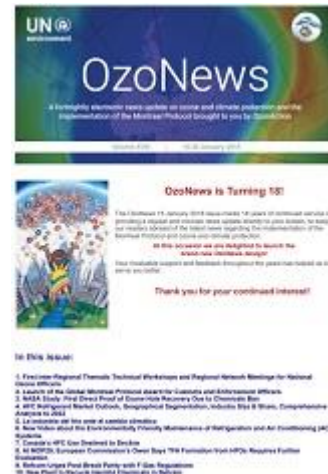
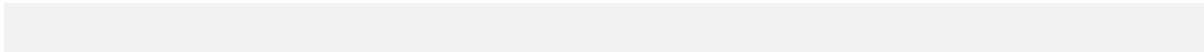
The inauguration of a World Refrigeration Day would not only be an ideal way to recognise the many historical achievements of the industry, but also a means to anticipate and overcome together the challenges we face. ... Click [here](#) for more information.



[The World Meteorological Organization \(WMO\) 2019 Calendar Competition](#)
WMO is holding a photo competition for its 2019 calendar. The theme is “**The Sun, the Earth and the Weather**” – which is also the theme of World Meteorological Day on 23 March 2019. [Learn more](#)

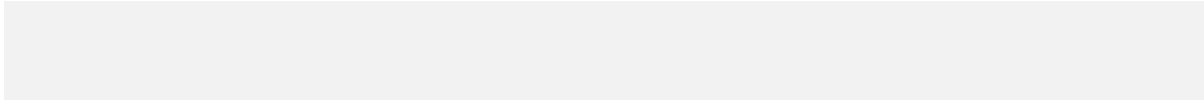


[Finnish researcher's animation shows climate warming at startling speed.](#) Global climate change is showing no signs of slowing down anywhere in the world, according to special researcher Antti Lipponen from the Finnish Meteorological Institute. In just over half a minute, the animation shows global high and low temperatures over the period 1880 to 2017.



[Current and previous OzoNews Issues, are available from OzonAction website](#)

[Download a PDF](#)



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Prepared by: Samira Korban-de Gobert, OzonAction

Reviewed by: Shamila Nair-Bedouelle, Head OzonAction Branch, and Ezra Clark, OzonAction

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