OzonAction

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UN environment

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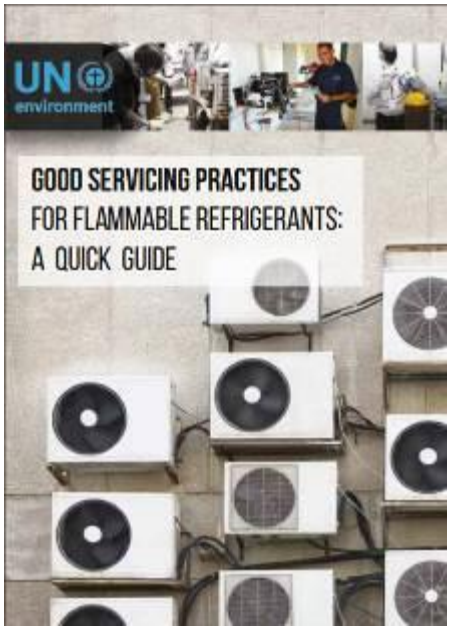
In this issue

UN environment

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

Special Announcement



NEW

OzonAction just launched:

"Good Servicing Practices, Flammable Refrigerants: A Quick Guide"

The aim of this practical guide book is to provide refrigeration and air-conditioning servicing technicians with a quick reference to the key safety classifications and technical properties of commercially available flammable refrigerants.

Additionally, it provides important safety guidance for the installation and servicing of room air-conditioners.

The guide book small format allows it to be easily carried for reference by working technicians.

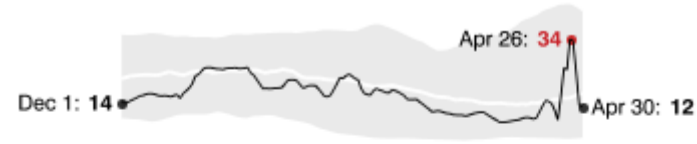
➡ Read/download

GLOBAL

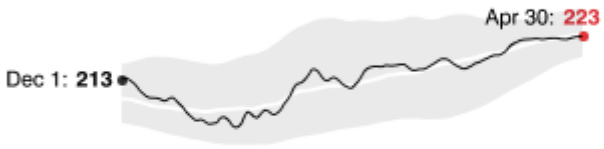
1. Latest Status of Arctic Ozone - Ozone Hole Watch

The latest false-color view of total ozone over the Arctic pole. The purple and blue colors are where there is the least ozone, and the yellows and reds are where there is more ozone.

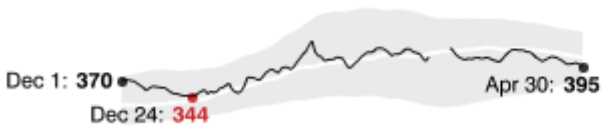
2016/2017 Season



Polar vortex area (millions of km²)



Polar cap temperature (K)



Polar cap ozone (Dobson Units)

The graphs above show the progress of this season's polar vortex. The gray shading indicates the highest and lowest values measured since 1979. The red numbers are the maximum or minimum values. The polar vortex guides the distribution of ozone and temperature in the Arctic stratosphere.

The data for the polar vortex area, the polar cap temperature, and the polar cap ozone are available.

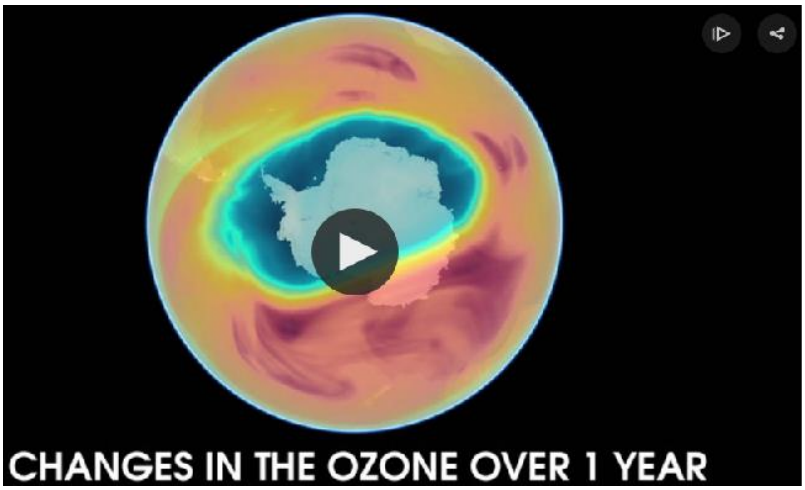
- National Aeronautics and Space Administration (NASA), Goddard Space Flight Center, 7 August 2017

2. Watch this Beautiful Visualization of the Ozone Layer over the Southern Pole

This beautiful swirling video tracks the movement of the ozone layer as it passes over the Southern Pole during an entire year. The data, collected by Europe's Copernicus Atmosphere Monitoring Service, shows how the hole in the ozone layer grows and shrinks over the year as the gas billows around the southern hemisphere.

The ozone layer, which sits around 25 kilometers (15.5 miles) above the Earth's surface, is critical for the existence of life on this planet, as it absorbs most of the UV radiation from the Sun hitting us. This is why when in 1985 it was realized that our production of chlorofluorocarbons (CFCs) was depleting the ozone layer over Antarctica, the world agreed on a global ban of CFCs, which were frequently used in cooling systems like refrigerators.

Since then, the hole discovered whirling above Antarctica has started to close, but it is still there as is evident by the beautiful video below. It is particularly evident when the amount of ozone in the southern hemisphere is compared with the thickness of the layer in the northern. While there is some thinning over the north pole, it is by no means as dramatic as over the southern.



Video: THE HOLE IN THE OZONE LAYER IS STILL THERE, BUT IT IS GETTING SMALLER. EUMETSAT/YOUTUBE

The colorful visualization uses data collected by EUMETSAT, a global operational satellite agency based in Europe that tracks the environment, weather, and climate around the world. It's thought that as the hole in the ozone layer, which is really more of a thinning, slowly heals itself, the damage will shrink to routinely under 20 million square kilometers (8 million square miles) by 2040.

The ozone layer is made up of a molecule known as ozone, which is formed when solar ultraviolet radiation – or just plain old sunlight – hits oxygen molecules floating free in the atmosphere. The UV radiation breaks apart one oxygen molecule to form two oxygen atoms, each of which then go on to react with other oxygen molecules to form ozone (O_3). This process occurs in an equilibrium of production and decomposition, until we started interfering.

It seems, then, that humans can influence global systems to achieve a positive result, despite what many might argue otherwise.

- IFL Science, 10 August 2017, By: Josh Davis

3. Managing Ozone Depleting Substances Banks

The use of ozone depleting substances (ODS) as refrigerants and foam blowing agents in the past has led to the accumulation of large amounts of ODS, e.g. in old refrigerators, insulation foam or cylinders. The emissions from these banks contribute not only to ozone layer depletion but also to climate change: Globally, the annual emissions from ODS banks amount to 1.5 $GtCO_2eq$ – emissions that could be avoided. If countries establish good ODS bank management, they may effectively prevent the uncontrolled leakage or release of ODS to the atmosphere.

A global roadmap published by GIZ Proklima now introduces the four key processes to establish good practices in ODS bank management. In addition, four thematic guidelines each treat a core issue of ODS bank management from conducting an inventory to the transboundary movement of disused ODS:

1. A suitable set of laws and regulations such as a venting ban and mandatory recovery of ODS for destruction, recycling or reclamation is essential. Ideally, operators of equipment are obligated to conduct leak checking,

adhere to national standards and comply with monitoring schemes. The related technicians' training and certification should be mandatory. This process is detailed in the Guideline on policy measures for the management and destruction of ODS.

2. A sustainable financing mechanism for appliances containing ODS includes extended producer responsibility (EPR) schemes, where the producers or importers of equipment are responsible for handling the waste components.

3. A functioning recycling and destruction infrastructure is based on a sufficient number of recycling and reclaim facilities. This prevents the accumulation of large amounts of disused ODS which would have to be destroyed. The Guideline to conduct an ODS bank inventory guides users in the quantification of the amount of ODS available in a country. Only if more than 10 tonnes of ODS are available for destruction per year, the use of local destruction facilities makes sense economically. Export of smaller amounts follow the established procedure under the Basel convention which is the subject of the Guideline on transboundary movement of ODS.

4. An effective collection mechanism is based on a sector plan which defines the responsibility of all involved players. If an informal sector exists, it should be incorporated into the mechanism. Both old equipment and refrigerants should be accepted without charge by manufacturers, retailers or collection points. This process is detailed in the Guideline to establish a collection system for equipment containing ODS. Equipment replacement programmes must ensure that the returned old equipment is subject to proper waste management.

The new publications provide essential knowledge and convincing arguments decision makers need to establish good practices in ODS bank management. They address decision makers in environmental ministries, national ozone officers and other interested parties concerned with the correct handling of ozone depleting substances in the public or private sector as well as civil society.

- All publications are available for download here
- Contact: Nicole Annette Müller, GIZ-Proklima

4. Global Methyl Bromide Market Analysis 2017-2022

Worldwide **Methyl Bromide Market 2017** presents a widespread and fundamental study of Methyl Bromide industry along with the analysis of subjective aspects which will provide key business insights to the readers. Global Methyl Bromide Market 2017 research report offers the analytical view of the industry by studying different factors like Methyl Bromide market growth, consumption volume, market trends and Methyl Bromide industry cost structures during the forecast period from 2017 to 2022.

Methyl Bromide market studies the competitive landscape view of the industry. The Methyl Bromide report also includes development plans and policies along with manufacturing processes. The major regions involved in Methyl Bromide Market are (United States, EU, China, and Japan). […]

The Methyl Bromide report does the thorough study of the key industry players to understand their business strategies, annual revenue, company profile and their contribution to the global Methyl Bromide market share. Diverse factors of the Methyl Bromide industry like the supply chain scenario, industry standards, import/export details are also mentioned in Global Methyl Bromide Market 2017 report. […]

Furthermore, distinct aspects of Methyl Bromide market like the technological development, economic factors, opportunities and threats to the growth of Methyl Bromide market are covered in depth in this report. The performance of Methyl Bromide market during 2017 to 2022 is being forecasted in this report.

In conclusion, Global Methyl Bromide market 2017 report presents the descriptive analysis of the parent market based on elite players, present, past and futuristic data which will serve as a profitable guide for all the Methyl Bromide industry competitors.

- RegistrarDaily, 10 August 2017

AFRICA

5. Counting on Kigali to Keep it Cool

[…] Africa's greatest challenges may lie in its cities, and that's where the heat wave impacts continue to grow. Some of that risk can be managed with passive cooling strategies in urban structures, but when market analysts talk about air conditioning, they talk about "hot spots" and heat. It's what's driving sales in China; it's why southern Europe's demand is up, it is why India and Africa are poised for growth in the sector.

Rachel Kyte, CEO of the United Nations Sustainable Energy for All initiative, pointed out last week – amid all the heat warnings – that cooling isn't a luxury good when people are suffering and dying. "It is a fundamental component of modern life — from cold supply chains for fresh food, to safe storage for life-saving vaccines and medicines, to cooler, safer work and educational environments that can elevate productivity," she wrote in a Time Ideas column. We need to provide more access to cooling, and that means more access to electricity.

It also means safer technologies so that air conditioning and refrigerants aren't an even bigger climate problem, and those solutions rely on moving away from dangerous hydrofluorocarbons (HFCs) and their key role in global warming. Widely praised as among the greatest win-wins in the fight against climate change, the HFC phaseout [down] is a goal of last year's Kigali amendment to the Montreal Protocol and will go into effect on January 1, 2019, once ratified by at least 20 nations. So far they include Rwanda and Mali, the Marshall Islands and Micronesia. The European Union announced its intent to ratify in July, and with its member nations is expected to ensure that the Kigali amendment will guide the cooler-planet effort.

To that end, Kyte's organization recently launched Cooling for All, and will convene its first panel on the sidelines of the UN General Assembly and Climate Week NYC next month. They'll seek to align better cooling solutions with efficient energy technologies and the overarching sustainability development goals (SDGs). That's because in the global-warming future, cooling won't be a convenience, or a luxury, or the mark of middle-class lives in China, Europe or the U.S. It will literally mean the difference between life and death in a hot world. […]

- Africa Times, 7 August 2017, By: Laureen Fagan

ASIA PACIFIC

6. Effective Technologies for Conversion of HFC-23

Bangkok, 11 July 2017 – In the margins of the 39th Open-Ended Working Group (OEWG) of the Montreal Protocol, held in Bangkok, Thailand, UNDP organized a side event devoted to presentation of technologies for conversion of HFC-23.

Under the Kigali Amendment the Parties to the Montreal Protocol shall report HFC-23 emissions and ensure that HFC-23 emissions generated from production facilities producing HCFCs or HFCs are destroyed to the extent possible using technology approved by the Parties. During her introductory remarks Ms. Xiaofang Zhou, Director of the Montreal Protocol Unit at UNDP, pointed out that HFC-23 emission control has been and will remain a hot topic in the global action in response to the climate change. However, while a lot of efforts have been put into destruction, it is important to consider a sustainable and cost-effective solutions to address this issue. Converting

HFC-23 emissions to environmentally safe and valuable chemicals would be an innovative solution. The Parties to the Montreal Protocol agreed that the costs of destroying HFC-23 from the off-gas, or by collecting and converting it to other environmentally safe chemicals, should be funded by the Multilateral Fund (MLF) to meet the obligations of Article 5 Parties.

Mr. Lew Steinberg from Midwest Refrigerants-USA presented their technology aimed at creation and recovery of organic halides from HFC-23 by the chemical Reaction of Hydrogen (H_2) and Carbon Dioxide (CO_2). This technology, already included in the list of approved ODS destruction technologies by TEAP in 2011, has a two-year history of pilot plant operation and computer modeling to prove the technology on a commercial scale. The company has completed engineering of a plant for commercial operations, which is ready for construction. The science has been combined with a business model for the HCFC-22 producers, so that the project will eliminate the HFC-23, delivering valuable outputs that are competitively saleable in the marketplace, which should incentivize the HCFC-22 producers to put their efforts behind it. The presentation can be downloaded here

Prof. Quan Hengdao presented a method of using HFC-23 as a raw material to make CF3I by vapor phase catalytic process. The synthesis routes of making CF3I were studied a lot and the traditional methods were difficult to be industrialized. The new method by reacting HFC-23 with I_2 and O_2 has the advantage of continuous flow, low by-product and cheaper raw materials. A venture cooperated with us is starting a plant in China to produce. It is a good ways to convert the HFC-23 to an environmental friendly chemical. The presentation can be downloaded here

Dr. Han Wenfeng presented three potential processes for the conversion of HFC-23 to valued added and environmentally benign chemicals developed at Zhejiang University of Technology: - Conversion to HCFC-22; - Conversion to vinyl difluoride, a monomer for the synthesis of poly(vinylidene fluoride), PVDF and other fluoroelastomers; and - Pyrolysis of CHF3 at high temperatures. The presentation can be downloaded here.

- Contact: Ajiniyaz Reimov, Montreal Protocol / Chemicals Unit, The United Nations Development Programme (UNDP)

7. Climate Action: Global Transition Away from HFCs

In India and the world, governments, businesses, and environmental groups continue to make steady progress toward phasing down the use of harmful climate-damaging hydrofluorocarbons (HFCs) in air conditioners, as shown in the recent Bangkok talks. While the recent decision of the DC Circuit Court to limit the Environmental Protection Agency's regulations on HFCs may temporarily slow progress in the United States, governments and companies across India and around the world are moving forward in implementing the Kigali Amendment and ensuring that HFCs, like their ozone-depleting predecessors, become a thing of the past.

Recently, the U.S. Court of Appeals for the District of Columbia Circuit (one of the courts below the U.S. Supreme Court and the court that is charged with reviewing many EPA Clean Air Act rules) issued a divided decision to EPA's efforts to cut emissions of HFCs in the United States. The case is called Mexichem Fluor, Inc. v. EPA.

Air conditioner units in India. NRDC

HFCs are refrigerants commonly used in air conditioners that are used in cars, homes and offices, as well as other cooling systems. HFCs are incredibly potent greenhouse gases; their global warming potential (GWP) is thousands of times that of carbon dioxide. This means that emitting a kilogram of an HFC contributes to climate change as much as a ton or more of carbon dioxide.

While they only account for a small portion of greenhouse gas emissions now, HFCs are the fastest-growing class of greenhouse gases. The demand for cooling and air conditioning use is likely to skyrocket in India and other developing countries. However, chemical companies and manufacturers are working on replacing HFCs with more climate-friendly alternative refrigerants. The Kigali Amendment to the Montreal Protocol, agreed to by countries around the world last fall, has established targets and funding for countries to phase down and replace HFCs.

India was key in the Kigali Agreement, and it is moving forward in reducing HFCs now as part of the global transition under the Montreal Protocol. India will freeze HFC use at 2024 levels, starting reductions in 2028. Air conditioning companies in India are replacing the older refrigerant, R-22, which both harms the ozone layer and has high global warming potential, with either R-410A, R-32 or R-290, of which R-410A has the highest global warming potential (GWP).

Recently, six of India's largest air conditioner manufacturers announced plans to leapfrog to the lower-GWP refrigerant HFC, R-32, instead of R-410A. The Indian market, like the European and Chinese markets, is also moving toward the hydrocarbon refrigerant R-290, which has the lowest GWP and is more energy efficient.

Companies in India and researchers are actively working on expansion of R-290 use as the refrigerant can cause safety concerns when applied to larger charge sizes. Replacing R-22 with R-410A – the high global warming potential refrigerant that developed countries chose a decade ago when making their transition – would solve one problem by creating another. The move to leapfrog beyond R-410A to more climate-friendly and energy efficient refrigerants, such as R-32 and R-290, helps put India on track to reduce the global warming impact of refrigerants used in air conditioning under the Montreal Protocol.

Countries around the world are also making progress in phasing down HFCs. An international push is critical to combating climate change, since the benefits of the planned reduction in HFC use flowing from the Kigali Amendment are huge—up to half a degree reduction in the increase in global temperatures. This represents a significant contribution towards achieving the goal of the Paris Agreement to limit future warming below 1.5-2.0˚C. The Kigali Amendment is a major global climate success; it shows that nations can work together to curb climate change, and that people across the globe can have affordable, climate-friendly air conditioning. What is more, worldwide progress towards the goals of the Kigali Amendment is continuing unabated despite the seeming setback of the U.S. court decision.

In India, for example, the national government has plans to develop a National Cooling Action Plan. A primary focus worldwide is enabling manufacturers who are currently making a transition from the use of ozone-depleting HCFCs to "leapfrog" HFCs and move right to ozone-friendly, climate-friendly alternatives. NRDC and our partners have been interviewing dozens of manufacturers over the last year to help determine what would enable them to transition to cleaner technologies faster. Another significant area of progress is updating safety standards and codes; many alternatives to HFCs are climate-friendly but flammable, and product design standards will need to be improved to ensure safe use of these refrigerants. At the Bangkok Talks, representatives of international and national safety standards committees presented plans and timelines for updating standards accordingly.

Replacing HFCs with climate-friendly refrigerants is a crucial part of combating climate change. While the DC Circuit Court decision may slow immediate U.S. implementation, it is fortunate that companies, environmental groups, and governments in India and around the world continuing with a global phase down.

Note: This updated post includes discussion on R-290 and links to our earlier post on energy efficient and climate-friendly refrigerants.

- The Natural Resources Defense Council (NRDC), 10August 2017, By: Anjali Jaiswal, Co-Authored by Henry Ruehl

WEST ASIA

8. The Perils of Black Market Refrigerants: Special Report

The rise of counterfeit refrigerants

Although it is notoriously difficult to put hard figures on the problem, historically, counterfeit refrigerants have been just as large a problem in the Middle East as in the rest of the world. This was demonstrated in 2013 by the seizure of almost 3,500 cylinders of counterfeit refrigerant by Saudi Arabian authorities. Similarly, in 2011, 6,000 cylinders The rise of counterfeit refrigerants

Although it is notoriously difficult to put hard figures on the problem, historically, counterfeit refrigerants have been just as large a problem in the Middle East as in the rest of the world. This was demonstrated in 2013 by the seizure of almost 3,500 cylinders of counterfeit refrigerant by Saudi Arabian authorities. Similarly, in 2011, 6,000 cylinders of dangerous toxic and flammable chemicals, labelled as refrigerants, were seized in the UAE.In 2015, a survey revealed that eight out of 10 residents of the UAE would prefer to use brand-name refrigerants in order to minimise the risks posed by counterfeits. The same survey also revealed the worry and threat posed by counterfeit refrigerants, as 73% of people are aware that counterfeit refrigerants can cause serious and costly equipment failure. Furthermore, 71% believe that refrigerants can be toxic and 67% know that they can be flammable.

Chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) refrigerants have been used in refrigeration and air conditioning systems. However, when their ozone depleting potential came to light, the Montreal Protocol was established to limit the environmental impact.

The phase down of these popular refrigerants led to the development and introduction of a new generation of substances, the hydrofluorocarbons (HFCs). Whilst HFCs have zero ozone depleting potential, many are perceived to have high global warming potential (GWP). The industry is now moving away from higher GWP refrigerants on a global basis with a new international agreement: the Kigali amendment to the Montreal Protocol, which will now see an HFC phase down in some countries from 2019. This agreement supplements measures already in place in both Europe, the US and Japan.

In the move away from higher GWP refrigerants, companies are looking to alternatives including hydrofluorolefins (HFOs) and non-halogenated 'natural' refrigerants. Although the newly developed refrigerants can have a lower direct global warming impact and zero ozone depleting potential, they present other concerns to system operators in characteristics, cost and safety.

Because counterfeit refrigerants are not made to the same exacting specifications as the genuine branded products, they could be contaminated, diluted or even a completely different substance from what is advertised. Unlike when buying from a reputable supplier, there is no guarantee that the refrigerant will meet that specification or Air Conditioning, Heating and Refrigeration Institute (AHRI) standard 700, which details the acceptable purities and compositions of refrigerants. A refrigerant that does not match specification can negatively impact the equipment in the system and can become a health and safety hazard.

System damage and performance

The most common result of using a counterfeit refrigerant is decreased system performance. This can be either because the refrigerant is not compatible with the system or because it has different characteristics to the ones expected, for example, different operating pressure. However, contaminated refrigerants can cause a range of issues including increased energy consumption, reduced equipment operating life, system failure and even dramatic incidents such as fires and explosions, which can result in injuries or death.

Introducing a refrigerant of poor quality or of an incompatible type to the system can also lead to equipment damage resulting in unwanted maintenance costs or downtime.

Safety

One major safety problem is that some counterfeit refrigerants have been found to contain a flammable compound, methyl chloride, which reacts with the aluminium in HVAC systems to generate reactive, toxic compounds which can burn violently when exposed to air.

An example of such an incident happened in 2011, where refrigerated shipping containers exploded in Vietnam and Brazil, subsequently killing three dockworkers. This was a result of methyl chloride contamination in the refrigerant, which was used in up to 8,000 containers.

Environmental implications

Counterfeit refrigerant is often smuggled between countries and operates outside the purview of environmental and other legislation. The reported incidents of methyl chloride contamination have been associated with counterfeit R134a refrigerant. However, R134a has also been contaminated with banned refrigerants such as R22. Not only can this have legal consequences such as severe fines, but buying refrigerant containing ozone-depleting substances is also undermining regulations designed to protect the environment.

Even when the identity of the refrigerant is the same as that of the branded product, the supply of black market material also acts to undermine the environmental regulations; there is little point in having controls on what can be placed on the market by authorised suppliers when there is little or no control on the supply of under-the-counter products. If the environmental regulations are to work in the way they were envisaged, refrigerant importers need to be licensed in the same way that they were to control the use of CFCs and HCFCs. Policing of refrigerant import and placing on the market will help ensure that that the end-user will source refrigerant from reputable suppliers who abide by the rules.

As discussed, counterfeit or poor quality refrigerant can also lead to decreased system efficiency, which increases the power consumption. In addition to greater running costs, the majority of a refrigeration system's carbon footprint comes from its power consumption and anything that acts to decrease efficiency is clearly bad news for the environment.

Detection methods

Fraudulent suppliers often plagiarise the packaging of reputable brands, which means the appearance of the packet is not enough to ensure the purchase of a genuine product. Although it's not always possible to detect a counterfeit

refrigerant from its packaging, it is possible to test a purchased product. One such refrigerant test is halide torch testing, which can be used to check for chlorinated compounds.

Equipment capable of detecting the unsafe refrigerant methyl chloride at low quantities has been available since 2012. This equipment can also be used to test for other contaminants including CFCs and hydrocarbons. Companies should use a combination of detection methods to safeguard the system from multiple contaminants. However, AHRI does not recommend pressure testing alone as a method of counterfeit detection, since a contaminant refrigerant blend could have similar pressures to the in-specification products but still result in unsatisfactory performance.

Tackling the issue

One of the biggest challenges of tackling the counterfeit refrigerant problem is that imitation products are marketed and sold in copied packaging, meaning that an inexperienced purchaser may easily be fooled. To avoid this, buyers should work together with original refrigerant manufacturers to understand how to differentiate between reliable original refrigerants and potentially dangerous imitations.

AHRI has published a white paper that explains four steps to avoiding counterfeit refrigerants. These include knowing your supplier, verifying refrigerant in cylinder, checking refrigerant before repairing or servicing and isolating contaminated systems. Following these steps helps purchasers and system operators protect themselves from the problems associated with counterfeit refrigerants.

At the end of the day, the best way that end users can be certain that they are purchasing a genuine product is to buy from a reputable supplier. By purchasing from a trusted supplier, you can ensure you don't unwittingly end up with the equivalent of a knock-off handbag.

Construction Week Online, 1 August 2017, By: Rajiv Ravindran Pillai

9. Ministry of Environment Begins to Receive the Work of the Competition « slogan of the celebration of World Ozone Day 2017 » (Egypt)

9 - البيئة" تبدأ تسلم أعمال مسابقة "شعار الاحتفال باليوم العالمي الأوزون

تبدأ وزارة البيئة من خلال وحدة الأوزون، اليوم الأحد، تسلم الأعمال الفنية المتقدمة لمسابقة رسم شعار الاحتفال باليوم العالمي للحفاظ على طبقة الأوزون لعام 2017 تحت شعار (رعاية جميع أنواع الحياة على كوكبنا) الذي تحتفل به دول العالم سنويا، وذلك عن طريق إرسال الأعمال الفنية على عنوان جهاز شئون البيئة أو تسلم باليد في مكتب خدمة المواطنين.

أكد الدكتور خالد فهمي، وزير البيئة، أن المشاركة في المسابقة تتطلب قيام المتسابق برسم لوحة لشعار الاحتفال، ويحق للمتسابق الاشتراك بعملين على الأكثر، مضيفًا أن المسابقة تنظم على مرحلتين عمريتين، من 10 إلى 16 سنة، ومن 17 إلى 35 سنة، ويتم إرسال الأعمال الفنية على عنوان جهاز شئون البيئة أو تسلم باليد فى مكتب خدمة المواطنين في مواعيد العمل الرسمية، اعتبارًا من اليوم وحتى الخميس 24 أغسطس.

وستقيم لجنة تضم عضوين من أساتذة التربية الفنية وعضو من جهاز شئون البيئة، الأعمال الفنية المقدمة للمسابقة، وتختار أفضل 10 أعمال فنية، وتخصص جوائز مالية لأفضل ثلاثة أعمال فنية عن كل مرحلة عمرية، لتكريم الفائزين في احتفالية يوم الأوزون العالمي.

Albawaba, 6 August 2017

LATIN AMERICA AND CARIBBEAN

10. Intensifican jornadas por la protección de la capa de ozono (Cuba)

Hoy comenzarán en el Parque Zoológico Nacional, en La Habana, las actividades por el Día Mundial para la protección de la Capa de Ozono, que se celebra oficialmente el 16 de septiembre.

Tales acciones están dedicadas a las niñas y niños que visiten esa instalación durante el verano, informó a la ACN el Centro de Gestión de la Información y Desarrollo de la Energía (CUBAENERGIA), y continuarán, del 16 al 19, en el Pabellón de la

Ciencia del recinto ferial de EXPCOCUBA; el 23 en el Museo Nacional de Ciencias Naturales; y el 30 en el Acuario Nacional.

Las jornadas concluirán con el acto central por las efemérides, el 15 de septiembre, en el Memorial José Martí, donde se darán a conocer los ganadores del concurso Protegiendo la Capa de Ozono.

En marzo último la Oficina Técnica del Ozono (OTOZ) invitó a niños y adolescentes cubanos a participar en su concurso anual, para la protección de esa especie de sombrilla que preserva al planeta contra las radiaciones nocivas del Sol.

Pueden intervenir en las categorías de hasta 10 años y de 11 a 18 años, según las bases del certamen en los géneros de literatura (en las modalidades de poesía, cuento y ensayo, entre otras), y de artes plásticas (en dibujo, pintura, técnica mixta, grabado y escultura, principalmente).

Cuba es signataria del Convenio de Viena para la Protección de la Capa de Ozono (1985) y del Protocolo de Montreal (1987), relacionado con la eliminación de la producción y el consumo de productos químicos industriales dañinos al medio ambiente.

Uno de los resultados de la OTOZ consiste en la abolición del Bromuro de Metilo, en particular en cultivos protegidos como el tabaco, y de los clorofluorocarbonos en la refrigeración doméstica, alcanzado con tanta masividad por los planes que poseen los organismos estatales, según expertos.

La capa en cuestión está ubicada en el anillo exterior de la Tierra entre 15 y 50 kilómetros de la estratosfera, y sirve de escudo al planeta contra las emanaciones solares, que dañan el sistema inmunológico, la vista, la piel, y en general la vida de los seres humanos.

- Tele Cubanacán, 09 Agosto 2017, Por: Lino Luben Pérez

NORTH AMERICA

11. Cornell Scientists Make Breakthrough in How Fertilizer Creates Ozone-Killing Gas

Research 'corrects 40 years of understanding,' author says

Cornell scientists have made a breakthrough in their understanding of fertilizer chemistry, and its role in worsening the effects of climate change.

The new research, published last month in the Proceedings of the National Academy of Sciences, flips on its head decades of understanding of how the ammonia contained in agricultural fertilizer can be converted into nitric oxide and nitrous oxide.

Though used in medical and dentistry procedures, nitrous oxide can severely deplete the ozone layer. In 2015, nitrous oxide accounted for about five percent of greenhouse gas emissions, according to the Environmental Protection Agency. While carbon dioxide accounts for about 82 percent, nitrous oxide has 300 times the warming potential.

"We've found a hole in the nitrogen cycle pipeline," said Jonathan Caranto, a postdoctoral researcher in chemistry and co-author of the report. "As there is nitrous oxide escaping out of the soil into the atmosphere, we now know where the holes are."

"In this pathway, nitrous oxide is made from nitric oxide," he said. "That's the immediate precursor. If you know where the nitric oxide is coming from, you can make a good guess about nitrous oxide being released."

Their findings "correct 40 years of misunderstanding" of how ammonia is metabolized by organisms that feed on fertilizer, said Kyle Lancaster, an assistant professor of chemistry and co-author of the report.

"As we're pumping more and more nitrogen-based fertilizer into the ground, these organisms are encountering a smorgasbord of food," he said.

"If we want to think about rational ways to apply fertilizer," he said, we "need to have a good model for now nitrogen flows through the environment. And if you don't know what the fundamental connections are ... you're not going to have a good, systematic way of fertilizing without imposing a tremendous environmental burden."

Though Lancaster said the discovery is only the first step in a much longer road to a "rational approach to fertilization," it could provide a road map for other scientific developments. Fertilizer has increasingly become a target in the fight against climate change, helping proliferate the use of so-called "precision farming" techniques that optimize crop yields and fertilizer usage. Other researchers have eyed changes in plant breeding to reduce their need for nitrogen-based fertilizer at all.

Since coming into use after World War II, such artificial fertilizers have helped propel a revolution in the global farming industry. But those chemicals can come at a cost, leaking into the air or in some cases running off into waterways, where they deplete oxygen levels and, in turn, create "dead zones" that destroy ocean habitats. In the Gulf of Mexico, for example, such a zone is expected to grow to roughly 10,000 square miles — about the size of Vermont.

In the Chesapeake Bay, meanwhile, a similar zone was expected to grow to the size of 3.2 million Olympic-sized swimming pools this summer, the National Oceanic and Atmospheric Administration reported in June. Such zones are likely to grow as runoffs, spurred by heavier rainfalls — also an effect of climate change — increase nitrogen levels in water by as much as 20 percent by the end of the century, according to another paper released last month.

"When we think about climate change, we are used to thinking about water quantity — drought, flooding, extreme rainfall and things along those lines," Anna Michalak, of the Carnegie Institution for Science, told the New York Times. "Climate change is just as tightly linked to issues related to water quality, and it's not enough for the water to just be there. It has to be sustainable."

- Times Union, 3 August 2017, By: Robert Downen

12. Work to Destroy Methyl Bromide Under Way

Methyl bromide has long been the viable fumigant to protect U.S. agriculture from certain insect pests that may ride on imported produce.

At a few locations along the Delaware River seaports, methyl bromide fumigates Chilean grapes. Despite years of research there has been no replacement for methyl bromide, which, while very effective it is highly regulated under various state and federal air quality standards.

Work to destroy methyl bromide before it is released into the atmosphere is under way this year in Philadelphia.

Western Fumigation, based in Lester, PA, is collaborating with Spencer Walse, a research chemist with the USDA Agricultural Research Service to recapture and destroy aerated methyl bromide after the fumigation process. Walse leads a research team of researchers, who represent a range of university researchers and industry consultants, according to Miriam Borja-Fisher, senior business development manager for Western. Walse's work, originally funded by a government grant, has been under way for five years.

Walse works from Parlier, CA, at the San Joaquin Valley Agricultural Sciences Center.

Holt Logistics is the host of the scrubbing research at its Gloucester Marine Terminal in Gloucester City, NJ.

Kurt Reichert, director of fumigation for Western, indicated that this research, which began in February, will run through this calendar year. The ongoing research is constantly tweaking a new technology that captures the methyl bromide after the fumigation process. "It's an attempt to destroy as much methyl bromide as possible," said Reichert.

The Philadelphia port industry publication, *The Beacon*, noted, "With over 70 receivers bringing nearly 30 million cases of grapes from Chile and kiwi through Delaware River ports each season, safe and efficient handling of these cargos are paramount."

When the research data collection is complete, the findings will be "shared with the New Jersey Department of Environmental Protection, which is overseeing the project. Results will be presented publicly at the 2017 Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions," *The Beacon* reported.

Borja-Fisher said the research will be shared with the port community upon completion.

- The Produce News, 31 July 2017, By: Tad Thompson

13. High-GWP Refrigerants Losing Market Share

Nominal demand projected for air conditioning retrofits with HFC-134a

The U.S. Environmental Protection Agency (EPA) has granted new regulatory flexibility to retrofit stationary air conditioners with a refrigerant that is slated to be phased out for other cooling, refrigeration and foam blowing purposes. HFC-134a, a hydrofluorocarbon with global warming potential (GWP) 1,300 times greater than carbon dioxide, is rarely used in existing residential and commercial rooftop units, but a recent EPA ruling deems it a comparable environmental and human health risk to other refrigerants currently allowed for retrofits.

HVAC industry insiders affirm the EPA's latest decision addresses a tiny fraction of the market so it isn't as incongruous with concurrent initiatives to restrict high-GWP refrigerants as it may appear. Notably, HFC-134a is among refrigerants that will be disallowed in newly manufactured centrifugal and displacement chillers as of January 2024 and will be prohibited in the manufacture of household refrigerators/freezers or as a blowing agent even earlier next decade.

"R-134a is not the refrigerant of choice for residential/light commercial air conditioning applications, even for retrofits," says Karim Amrane, senior vice president, regulatory and international policy, with the U.S. Air-Conditioning, Heating and Refrigeration Institute (AHRI). "The predominant refrigerant in this end use is R-410A."

R-410A has a GWP of 2,088, but HFC-134a is not an interchangeable replacement. Rather, it owes its market share to its compatibility with the hydrochlorofluorocarbon (HCFC) refrigerant, R-22, which has a GWP of 1,760 and was used in a wide range of applications until the HCFC phase-out under the Montreal Protocol pushed it toward obsolescence.

Under the Montreal Protocol, the consumption of HCFCs in developed countries has been cut by more than 90 per cent since 1996, heading to a complete stoppage of production and/or imports in January 2020. After that, a marginal supply — 0.5 per cent of the 1996 volume of consumption — will be available until 2030 to service existing refrigeration and air conditioning equipment that's still operational. Currently, the newest equipment that relies on HCFC-based refrigerants would have been manufactured in 2010, which is still an early stage in the lifecycle of a chiller, but much more advanced for split and packaged air conditioning systems that typically last 15 to 20 years.

"There are plenty of them out there, but they are rapidly starting to disappear," observes Warren Heeley, president of the Heating, Refrigeration and Air Conditioning Institute (HRAI) of Canada.

Regulatory approach differs in Canada and the U.S.

Although the EPA's new allowance for HFC-134a in retrofits of residential/light commercial air conditioning would theoretically open the way for U.S.-based equipment owners to convert systems that are now using R-22, the business case for a switchover from HCFCs to a high-GWP HFC is dubious. Canadian equipment owners already had leeway to do the same thing, but after seeing what's happening with price trends for the shrinking supply of HCFCs, Heeley suggests they may be hesitant to switch to a substitute with a phase-down destiny.

Similarly, the impact analysis accompanying Canada's December 2016 amendment to its Ozone-depleting Substances and Halocarbon Alternatives Regulations indicates that the government intends to leverage to market forces to deploy its strategy. "The domestic air-conditioning industry would not be subject to product-specific controls under the proposed amendments. However, it is expected the end-use would be affected by the proposed bulk phase-down, as the decrease in the availability of refrigerants using HFCs is expected to cause manufacturers to transition to alternatives," it states.

Canada and the U.S. were both key sponsors of last year's Kigali amendment to the Montreal Protocol, which sets targets for a phase-down in production and use of HFCs, but they are taking somewhat differing regulatory routes to deliver on their promises. Canada has established GWP thresholds for various categories of uses, which will be lowered on a phased scheduled. To begin, there is a prohibition on manufacture and import of chillers using HFC refrigerants with a GWP greater than 700.

In contrast, the U.S. identifies and allows or disallows specific products through the EPA's Significant New Alternatives Policy (SNAP) program. Industry insiders hypothesize the EPA's latest decision arises from an equipment manufacturer's request.

"Generally, it would be a manufacturer of a niche product for which none of the other substitutes (acceptable refrigerants) make sense," explains Mark Menzer, director of public affairs with the HVAC/refrigeration supplier and engineering firm, Danfoss. "EPA then evaluates the request and we can assume that they determined, on balance, that the use of higher GWP refrigerants was the better choice from the standpoint of the environment and human health."

The July 21 ruling also lists R-458A, an HFC blend with a GWP of 1,650, as acceptable for retrofit of residential and light commercial air conditioners. In both cases, the EPA decision states "it does not pose greater overall environmental and human health risk than other available substitutes in the same end-use."

- REMI Network, Canadian Property Management, 3 August 2017, By: Barbara Carss

EUROPE & CENTRAL ASIA

14. New Laws to Get Tough on Non-Compliance (UK)

The Environment Agency (EA) could receive increased powers of prosecution following concerns of installations and refrigerant purchases by non-F-gas-certified companies.

Concerns over qualification and competence checks and a rise in non-compliant ID cards were topics raised by F-gas certification body Refcom during a recent meeting on key industry issues with representatives from DEFRA.

While suppliers and distributors have a legal responsibility to check the operative purchasing gases has original F-gas certificates or an ACRIB SKILLcard, Refcom says it is worried about the development of alternative ID methods claiming to be acceptable representation of a company's F-gas certification. Refcom maintains that DEFRA shares those concerns.

"In other areas, there are still reported cases of split systems being bought by non-qualified companies and installed illegally, often badly, so that legitimate Refcom registered companies have to go in after the installation and put right the many deficiencies in install quality," the group claims on its website.

Article 11(5) of the regulation aims to stop the sale of split systems that would then be installed by non-certified companies or personnel. End users are allowed to buy a pre-charged split system but they must provide evidence of who will carry out the installation and their registration number for the authorities to check.

"It is a legal requirement that the seller check this evidence," says Refcom, "although it is clear this is not always happening."

As a result of its revelations, Refcom maintains that new legislation is now being drafted to give the EA increased powers of prosecution against non-conforming companies and end users under increased domestic civil penalty laws.

- CoolingPost, 6 August 2017, By: Neil Everitt
- See also: New F-Gas qualifications launched by Logic Certification

FEATURED

OZONE SECRETARIAT

Reminder to submit comments on the proposed revised data reporting forms and guidelines and on the reporting of mixtures and blends containing HFCs, by 30 August 2017

The Ozone Secretariat refers to the above mentioned subject. In paragraph 31 of the report of the thirty-ninth meeting of the Open-ended Working Group of the Parties to the Montreal Protocol, held in Bangkok from 11 to 14 July 2017, it is recorded that a number of parties had wished to provide the Secretariat with additional or more comprehensive comments on the proposed revised data reporting forms and guidelines and on the reporting of mixtures and blends containing HFCs.

Kindly submit any comments on these issues, should you wish to do so, by 30 August 2017, which is the agreed deadline for parties to submit their comments in order to allow the Secretariat sufficient time to review the comments received and to make any necessary revisions to the data reporting forms before the Twenty Ninth Meeting of the Parties.

The Ozone Secretariat would like to thank the parties which have already submitted their suggestions and comments and we look forward to receiving any information your Government may wish to provide, by the end of August 2017.

The Ozone Secretariat, August 2017

- Vienna Convention and Montreal Protocol Meetings: A Primer - Read/Download
- - Twenty-Eighth Meeting of the Parties
- 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 39th Session of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, preceded by the 58th 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.

«Caring for All Life under the Sun" Theme and Logo for 30th Anniversary of the Montreal Protocol and International Ozone Day 2017

The 30th anniversary of the Montreal Protocol, which we are commemorating this year, and the International Day for the Preservation of the Ozone Layer to be marked on 16 September, will be celebrated under the theme:

Caring for All Life Under the Sun

The theme is complemented by a logo that illustrates the Montreal Protocol's focused and singular goal to protect all life on Earth.

The logo and theme celebrate the Montreal Protocol's critical role in caring for life on the planet over the past 30 years by preventing massive damage to human health and the environment from excessive ultraviolet radiation from the sun by phasing out nearly 99 per cent of close to 100 substances that deplete the ozone layer.

As a result of the unwavering commitment of the parties to the Montreal Protocol during the past three decades, the ozone layer is on track to recovery by mid-century. In addition, up to 2 million cases of skin cancer may be prevented each year by 2030.

The Montreal Protocol is also one of the prime contributors to the fight against climate change, as it averted more than 135 billion tonnes of carbon dioxide equivalent emissions from 1990 to 2010.

The Kigali Amendment to the Montreal Protocol, which was adopted in 2016, is expected to avoid up to 0.5° Celsius warming by the end of the century, while continuing to protect the ozone layer.

The logo and theme in all the six official UN languages are posted on the Ozone Secretariat website for wider dissemination, together with brand guidelines on their usage. Parties are also encouraged to download and use the email signature image of the logo and theme.

In the coming months, the Ozone Secretariat will conduct a communication campaign to celebrate the 30th anniversary and will provide the parties with more information about the campaign and related products to support commemorative activities. We would also be pleased to receive any information products for your planned commemorative activities for wide dissemination through our website.

As in previous years, we expect that the United Nations Secretary-General's message for International Ozone Day to be shared prior to the day for further dissemination.

Once again, the Ozone Secretariat will provide limited financial assistance to four developing countries to contribute towards organizing their national commemorative activities. The Secretariat invites the parties to submit their plans of celebration activities and requests for assistance by 31 May 2017. Kindly send them to the Secretariat at dan.tengo@unep.org and ozone.info@unep.org

- 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
- TEAP

Assessment Panels List of Meetings

SYNTHESIS REPORTS

- 2014 assessments
- 2010 assessments
- 2006 assessments

THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

79th meeting of the Executive Committee, Bangkok, 3-7 July 2017

Report of the 78th meeting of the Executive Committee

Adjusted business plan of the Multilateral Fund for 2017-2019 after the 77th meeting of the Executive Committee

Learn more

OZONACTION

UN Environment, OzonAction highlights

NEW

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 Store

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

Download on the App Store GET IT ON Google Play

OzonAction is pleased to share with you some awareness raising products that you can download and use for your activities to celebrate the

30th Anniversary of the Montreal Protocol on Substances that Deplete the Ozone Layer, and the International Ozone Protection Day, on 16 September.

Please visit OzonAction' 2017 Ozone Day website >>>

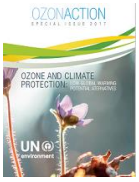
The Kigali Amendment to the Montreal Protocol - Opportunities and Next Steps - OzonAction Video

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



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 28th Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase-down hydrofluorocarbons (HFCs) continues the historic legacy of the Montreal Protocol. This factsheet summarises and highlights the main elements of the Amendment of particular interest to countries operating under Article 5 of the Protocol (Article 5 Parties).

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

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!**

Now available in the Android Play Store and Apple Store/iTunes.

Available on the App Store | ANDROID APP ON Google play

(*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. 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.

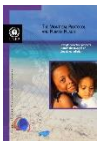
The NOUs were asked about their success stories, alternative refrigerants selected and their personal messages for national ozone celebrations…

Click here to access the News Drops

OzonAction Recent Publications:

Lower-GWP Alternatives in Commercial and Transport Refrigeration: An expanded compilation of propane, CO_2, 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_2 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.

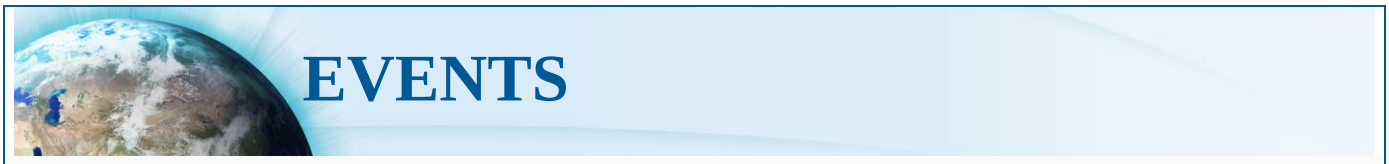
FINANCING THE CLIMATE CO-BENEFITS OF THE HCFC PHASE-OUT - A guide for Low Volume Consuming Countries - Hydrochlorofluorocarbons (HCFCs) are being phased out worldwide under the Montreal Protocol on Substances that Deplete the Ozone Layer. The Parties to this treaty encouraged countries to promote the 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.



2017

9th International Conference on Compressors and Coolants, 6-8 September 2017, Bratislava, Slovakia

ATMOsphere Asia 2017 taking place a day before the **Bangkok RHVAC trade show**, 7-9 September, which ranks among the world's best HVAC&R exhibitions and is the second largest in the Asia Pacific region.

FEBRAVA 2017 - **20th International Refrigeration, Airconditioning ,Ventilation, Heating and Air Treatment Fair** , 12 - 15 September 2017, Sao Paulo, Brazil

Future of HVAC 2017 – 13–14 September 2017, Sydney, NSW, Australia

EUREKA Italy, the first stop of the EUREKA roadshow, on 15 September 2017 in Mestre (Venice), Italy. EPEE and EVIA, the organisers of the annual EUREKA conference, are launching the "EUREKA roadshow", a series of national events to discuss the challenges the HVAC-R industry faces across EU Member States. Register here!

Symposium for the celebration of the Montreal Protocol 30th Anniversary - From the safeguard of the ozone layer to the protection of the earth climate, 19 - 20 September 2017, Paris, France

Le salon SIFA (salon interprofessionnel du froid et ses applications), organisé par La Rpf et le groupe LSA / Usine Nouvelle, aura lieu du 3 au 5 octobre 2017 au Dock Pullman de Paris, France. Le SIFA est un salon-congrès portant sur les enjeux réglementaires, économiques, techniques et

environnementaux relatifs au FROID dans les domaines du tertiaire, de la grande distribution, l'agroalimentaire et de l'industrie.

EUREKA 2017: Heating, Cooling & Ventilation: Sustainable technologies for a better life, 11-12 December 2017, Berlin, Germany

2018

1st IIR International Conference on the Application of HFO Refrigerants. 2-5 September 2018, Austin Court Conference Centre, Birmingham, United Kingdom

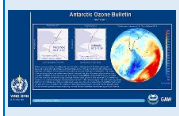
The HVAC & Refrigeration Show, 23 - 25 January 2018, London, United Kingdom

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

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

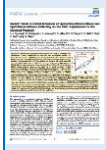
AREA Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants - AREA has updated its Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants.

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_2-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 Grabiel. 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. …

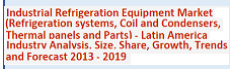


Recent Trends in Global Emissions of Hydrochlorofluorocarbons and Hydrofluorocarbons: Reflecting on the 2007 Adjustments to the Montreal Protocol. S. A. Montzka *†, M. McFarland ‡, S. O. Andersen §, B. R. Miller †∥, D. W. Fahey †, B. D. Hall †, L. Hu †∥, C. Siso †∥, and J. W. Elkins †† Earth System Research 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, Colorado 80309, United States

Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems- ASHRAE

A first edition, the IIR guide "CO_2 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…



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 38th 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 iifiir

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

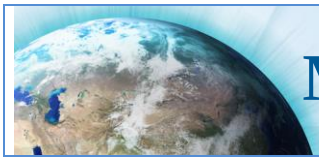
[The Environmental Investigation Agency (EIA)](), recently launched report: *[Chilling Facts VII]()* , *Chilling Facts I-VI* reports available [here]()

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]()

[The Dirtiest Contraband in Gibraltar](), El Pais, 8 August 2017

"[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…



MISCELLANEOUS

Announcement!

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 30th Anniversary of the Montreal Protocol - which was agreed as 16 September 1987.

The new website will be launched during the upcoming 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

Looking forward to receiving the 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 important contribution to the Montreal Protocol success and ozone layer protection.

- Contact : Samira Korban-de Gobert, UN Environnement, OzonAction

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

How will the heat pump market move towards natural refrigerants? Eric Delforge talks about the energy-efficient properties of natural refrigerants when used in heat pump applications.

Watch on r774's YouTube channel

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:

- 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.
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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

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

"It could be a high repair bill:" The air conditioning change that could impact your pocketbook, Fox6Now, 17 July 2017, By: Jenna Sachs

EPA-GreenChill Webinar: **Using Refrigeration Batteries to Manage Energy Use**,

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

Description: Amrit Robbins (President and Co-Founder of Axiom Exergy) and Tristam Coffin (Director of Sustainability & Facilities at Whole Foods Market) will discuss Axiom Exergy's first full-scale installation of its Refrigeration Battery platform at a Whole Foods Market in Northern California. The webinar will include an overview of the Refrigeration Battery technology, its value proposition for refrigerated facilities and the grid, and Axiom Exergy's vision for the future of refrigeration. We will also discuss the potential energy and climate impacts of the Refrigeration Battery platform.

To join the webinar: 1. Visit the webinar access page: Using Refrigeration Batteries to Manage Energy Use<http://epawebconferencing.acms.com/batteries/>. 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#

Learn more

First look of Kadvi Hawa launched by UNEP head Erik Solheim - New Delhi, Aug 10 (PTI) The poster of Nil Madhab Pandas film "Kadvi Hawa", which addresses the burning issue of climate change, was unveiled today by Erik Solheim, the general and executive director, United Nations Environment Programme.

The Montreal Protocol Who's who

See the latest nominations /

Nominate Ozone Layer Protection Champion

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