



OzoNews

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

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1. World Ozone Day 2019, Letter to National Ozone Officers

Dear National Ozone Officers,

World Ozone Day, September 16, is the UN celebratory day that marks the anniversary of the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. It is the birthday celebration for this landmark multilateral environmental agreement that continues to protect human health and the environment from the harmful effects of excessive UV radiation from the sun. Without the stratospheric ozone layer, life on Earth would be impossible. Thanks to over three decades of individual and collective actions taken by governments, scientists, industry, non-governmental institutions, and citizens in all 198 Parties, we have reduced cases of skin cancer, cataracts, and immunodeficiency in our populations; preserved or enhanced agricultural production; and reduced damage to wildlife and ecosystems. All of this contributes significantly to the Sustainable Development Goals, which have been agreed to by your government.

We thus have many reasons to be thankful for this treaty, which has protected us since its establishment in 1987. This is why **32 Years and Healing** has been selected by the Ozone Secretariat as the theme of this year's celebration. Now is a good time to reflect on what activities you would like to plan in your respective countries to celebrate this year's World Ozone Day. UNEP OzonAction is your partner and we encourage you to think creatively about how to involve the public and the key stakeholders in this year's event.

OzonAction is pleased to provide you with two exciting new documents produced by the Compliance Assistance Programme (CAP) that are suitable for use in your national celebrations. One is broad and inspirational, and the other is specific and practical, however both reflect different aspects of the Montreal Protocol's impact on our lives:

• **Women in the Refrigeration and Air-conditioning Industry - Personal Experiences and Achievements.** Refrigeration and air-conditioning are crucial for our health, nutrition, comfort and well-being. From prevention of food wastage to preservation of vaccines, from air-conditioning in hospitals to our homes, we increasingly rely on the advances that refrigeration has brought us. However, all around the world the sector has always been a largely male-dominated work environment. The fast-growing sector can offer a wide variety of interesting and fulfilling careers for women as well as men. UNEP OzonAction and UN Women have compiled a booklet to raise awareness of the opportunities available to women and to highlight the particular experiences and examples of women working in the sector and to recognise their successes. Being aware of these experiences and the opportunities available can encourage and inspire other women to consider similar careers and support girls to seek to follow a career path in this fast growing and important sector. *This inspirational document is suitable for wide outreach to the general public, to schools, training centers and those preparing for future careers.* [Download booklet](#)

• **HS Codes for HFCs - Advice for Countries in Advance of the 2022 HS Code Update.** The Kigali Amendment requires Parties to put into place an import and export licensing system for hydrofluorocarbons (HFCs) by 1st January 2019 (or two years later if required). To enable a licensing system to function effectively, it is important that the government is able to monitor and record imports and exports of each specific HFC individually. Import and export statistics are normally collected by customs officers using the international product nomenclature system – the Harmonized Commodity Description and Coding System, or Harmonized System (HS). However, until the HS is revised in 2022, all HFCs are contained in a single HS code which does not allow differentiation of the individual chemicals or of mixtures. This document outlines a proactive interim approach, recommended by the World Customs Organization (WCO), to establish additional digits in the existing national HS codes to identify specific HFCs. *This practical document is suitable for outreach to the customs agencies, customs officers in the field, and others involved in controlling trade in HFCs.* [Download document](#)



In addition to the above documents, OzonAction also has a wide range of existing information and awareness-raising materials that could also be used for your national celebrations. Please refer to the [Ozone Day webpage in the OzonAction website](#).

We would appreciate very much to receive information about your planned World Ozone Day activities or reports about what took place for posting on the OzonAction website. Please send this information to your Network's Montreal Protocol Coordinator or directly 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 Network's Montreal Protocol Coordinator.

We thank you for your ongoing commitment to compliance with the Montreal Protocol and your excellent work in implementing your national strategies and projects. On behalf of the entire OzonAction CAP team, I wish you great success in this year's World Ozone Day celebration!

Yours sincerely,

James S. Curlin
Acting Head of OzonAction
UN Environment, Law Division

[Ozone Day 2019 webpage in the OzonAction website](#).

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

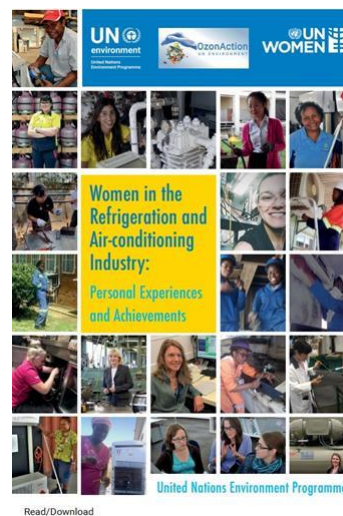
Refrigeration and air-conditioning is crucial for our health, nutrition, comfort and well-being. From prevention of food wastage to preservation of vaccines, from air conditioning in hospitals to our homes, we increasingly rely on the advances that refrigeration has brought us.

However, all around the world the sector has always been a largely male-dominated work environment. The fast-growing sector can offer a wide variety of interesting and fulfilling careers for women as well as men.

The United Nations Environment Programme's (UNEP), OzonAction, in cooperation with UN Women, has compiled this booklet to raise awareness of the opportunities available to women and to highlight the particular experiences and examples of women working in the sector and to recognise their successes. All of the professionals presented in the booklet are pioneers. They are role models whose stories should inspire a new generation of young women to enter the field and follow in their footsteps.

They are also making tremendous contributions to society. The appropriate implementation of refrigeration and air-conditioning technology can assist countries in achieving the United Nations Sustainable Development Goals (SDGs). Specifically, it contributes to achieving food security, improved nutrition and sustainable food systems (SDGs 2 and 12), ensuring healthy lives and promoting well-being (SDG 3), and promoting sustained, inclusive and sustainable economic growth (SDG 8). Making the transition from ozone depleting substances (ODS) and chemicals with high global warming potentials (GWPs) has already made a significant impact on combatting climate change (SDG 13). Encouraging women to pursue refrigeration and air conditioning careers and facilitating the process for them also contributes to gender equality and empowering women and girls (SDG 5).

The refrigeration and air conditioning (RAC) sector is crucial to all countries in successfully phasing out hydrochlorofluorocarbons (HCFCs) and, soon, slowing the use of hydrofluorocarbons (HFCs) under the Montreal Protocol on Substances that Deplete the Ozone Layer.



Through its role as an implementing agency of the Multilateral Fund, OzonAction assists developing countries in complying with their commitments under the Montreal Protocol, through a combination of compliance assistance services and national, regional and global projects.

[Download the publication](#)

The United Nations Environment Programme's (UNEP), OzonAction, August 2019

3. HS Codes for HFCs - Advice for countries in advance of the 2022 HS code update

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This practical document is suitable for outreach to the customs agencies, customs officers in the field, and others involved in controlling trade in HFCs.

Document prepared by the UN Environment Programme in cooperation with the World Customs Organization (WCO)

[Download the publication](#)

Contact: Dr. Ezra Clark, UNEP, OzonAction

UNEP, OzonAction, August 2019



4. Update on new refrigerants designations and safety classifications - factsheet

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

The United Nations Environment Programme (UNEP), represented by the OzonAction-Law Division, and ASHRAE have a Memorandum of Understanding to establish technical cooperation and mutual coordination toward providing professional technical services to the refrigeration and air-conditioning stakeholders (governmental, private, and public). The organizations work to ensure that up-to-date related technical information and standards are properly introduced and promoted.

Download the [Factsheet](#)

Contact:

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



5. Se rafraîchir durablement - Tribune par Inger Andersen, Directrice exécutive du programme des Nations unies pour l'environnement

Une nouvelle vague de chaleur touche l'Europe, les climatiseurs des villes sont à fond, et fabriquent ainsi de la chaleur : un cercle vicieux. Il existe d'autres solutions.

Tribune. Il faut nous attendre à ce que cette situation de canicule devienne de plus en plus familière.

La climatisation apporte un soulagement à court terme. Mais, à long terme, ce système revient à mettre de l'huile sur le feu. Au fur et à mesure que la planète se réchauffe et que la classe moyenne se développe à travers le monde, on estime que le nombre de climatiseurs utilisés passera de 1,6 milliard à 5,6 milliards à l'horizon 2050. La demande en énergie sera donc plus forte, davantage d'émissions de gaz à effet de serre responsables du réchauffement de la planète seront générées et, par conséquent, davantage de vagues de chaleur surviendront. Nous tournons en rond, prisonniers. Mais nous souhaitons tous échapper à la chaleur étouffante. Dans de nombreux endroits, le refroidissement est une question vitale. Près d'un tiers de la population mondiale souffre de températures dangereuses pendant plus de vingt jours par an. Les canicules provoquent 12 000 décès chaque année.

Pouvoir se rafraîchir est également indispensable à notre productivité. Une étude réalisée dans la revue scientifique *The Lancet* estime que les températures élevées de l'année 2017 ont causé la perte de 153 milliards d'heures de travail à travers le monde. On estime que la vague de chaleur de 2003 a entraîné la diminution de près de 0,2 % du PIB français, ce qui équivaut à une perte pouvant atteindre 30 milliards d'euros.

Le refroidissement est fondamental au développement durable. Nous devons assurer un accès équitable au refroidissement pour protéger les personnes de la chaleur extrême, maintenir les aliments au frais, conserver les vaccins, et bien plus encore.

Nous devons réfléchir aux différents moyens de nous rafraîchir.

La nature peut offrir des solutions, en particulier dans le cas des villes, où l'effet «îlot de chaleur urbain», c'est-à-dire lorsque le béton absorbe la chaleur du soleil et la rejette, contribue à augmenter les températures. En transformant nos jungles de béton en forêts urbaines, les villes seront plus fraîches, nous les rendront plus agréables à vivre, et cela nous permettra d'économiser l'énergie requise pour la climatisation. Pendant la



journée, les parcs urbains peuvent contribuer à réduire la température ambiante d'environ 1°C en moyenne. A Medellín, la deuxième plus grande ville de Colombie, un projet visant à transformer les bordures de 18 routes et 12 voies navigables en un paradis verdoyant a permis de faire baisser les températures de 2°C, selon le maire de la ville. La ville de Milan, qui a subi des coupures de courant en raison de la demande estivale en climatisation, prévoit de planter trois millions d'arbres à l'horizon 2050. Les toitures végétales ont également pour effet de réduire la consommation d'énergie de 10 à 15 %.

Cependant, les solutions basées sur la nature ne sont qu'une partie de la solution. La Cool Coalition, dirigée par le Programme des Nations Unies pour l'environnement, regroupe des gouvernements, des entreprises, des organisations de la société civile et internationale, et recommande une approche globale pour assurer la réduction des émissions du secteur du refroidissement. Les systèmes de rafraîchissement urbain sont une autre solution. A Paris, un réseau de refroidissement urbain remplace la climatisation dans de nombreux bureaux, magasins et hôtels, ainsi que dans des bâtiments emblématiques comme le Louvre, en pompant de l'eau froide de la ville.

Il est également essentiel d'améliorer l'efficacité des climatiseurs et des autres équipements de refroidissement. Selon l'Agence internationale de l'énergie, les rendre plus efficaces permettrait d'économiser jusqu'à 2 900 milliards de dollars (2 600 milliards d'euros) d'investissements, de carburant et de coûts d'exploitation. Il est possible d'améliorer leur efficacité en tirant parti de l'amendement de Kigali au protocole de Montréal, dans le cadre duquel les pays ont convenu de réduire l'utilisation de réfrigérants connus pour être de puissants gaz à effet de serre. Le remplacement de la plupart de ces gaz seuls pourrait éviter un réchauffement d'environ 0,4° C d'ici la fin du siècle.

Alors que les gouvernements, les nations et les entreprises se préparent au Sommet sur le climat organisé par le secrétaire général de l'ONU en septembre, nous devons tous faire preuve de plus de discernement quant à la façon dont nous nous rafraîchissons.

[Libération, 22 juillet 2019](#)

6. Why demand for cooling could make the world hotter

As records tumble across Europe in a second heatwave of the summer and as people across China and North America are also feeling the heat, we can literally sense how influential cooling is for our wellbeing, productivity and environment.

Cool buildings and vehicles, as well as cooling in industrial processes and "cold chains" that ensure our food and medicines are safe, are things we either take for granted or increasingly come to expect.

With demand for cooling expected to soar in major developing economies as the world becomes warmer and hundreds of millions of people become able to afford their first air conditioner, unmanaged cooling growth could cause a surge in greenhouse gas emissions and hamper our ability to manage global warming.

Yet solutions to this challenge do exist. Efficient and clean development of cooling can make a significant contribution towards respecting the 1.5C and 2C Paris temperature limits. Moreover, those limits can check the need for cooling, reducing the scale of the challenge it poses.

Cooling in a warming world

In a warming world, access to cooling is not a luxury: vulnerable populations depend on it for nutritious food, safe medicines, productivity and protection from extreme heat.

Some 470 million people in poor rural communities in hot climates lack access to electricity and therefore to conventional space cooling and refrigeration technologies. This includes "cold chains" for the transport of temperature-sensitive goods such as medicines, or getting food from farm to fork with minimal wastage. This lack of access to cooling can limit good health outcomes, agricultural productivity and opportunities for economic self-sufficiency.

Food loss and waste amounts to one third of all food produced for human consumption, placing avoidable pressures on land-use and associated greenhouse gas emissions. Smallholders lacking access to electricity



disproportionately suffer supply chain losses of food, which are at least twice as high as in the most efficient supply chains. Incomplete and broken cold chains are a key contributing factor to this loss.

Some 630 million people on the lowest incomes in the hottest cities – often in poor quality housing – may only have intermittent access to cooling services or struggle to afford them. This can compromise food safety and exacerbate vulnerability to heat stress from increasingly frequent and intense heatwaves brought about by human-induced climate change.

Energy system challenges

There are 1.6bn residential air conditioners in use today. Most households in hot countries have not yet purchased their first air conditioner (AC), and ownership could rise to 5.6bn by 2050.

Business-as-usual development of space cooling, with incremental improvements in energy efficiency standards, means that energy demand for it could triple by mid-century to 6,200 terawatt hours (TWh). This is the equivalent to over a quarter of today's global power consumption for all uses and could require power generation investment of some \$3.2tn.

On hot days, space cooling demand can place significant stress on power grids. Almost exactly two years ago during summer in Beijing, cooling for buildings contributed more than half of daily peak power demand.

Today's unmet cooling needs extend well beyond cooling buildings into cold chains, mobility and industry. Looking at this wider range of uses, while ensuring full access to cooling to protect vulnerable people from the effects of heat extremes and broken cold chains could mean energy demand as high as 15,500TWh in 2050 – two thirds of today's global power demand – even if aggressive energy efficiency and demand-response standards for cooling equipment were to be pursued.

Greenhouse gas emissions

Current, conventional cooling technologies, such as air-conditioning and refrigeration, rely on human-made refrigerants – usually fluorinated (F) gases, such as hydrochlorofluorocarbons (HCFCs) – that can be 10,000 times more potent than CO₂ in causing global warming.

Left unchecked, F-gases could account for nearly 20% of total greenhouse gas emissions by 2050. This is why the phase down of the current generation of F-gases under the Kigali Amendment to the Montreal Protocol – and its ratification by national governments – will have such important consequences for efforts to limit global warming.

Cooling's large and growing demand for electricity – in the major growth markets often generated with coal – means that it poses a serious challenge to reducing power sector emissions.

In 2017, the amount of residential AC load connected to the world's power grids – estimated at 100 gigawatts (GW) – exceeded that year's record addition of solar capacity, some 94GW. This suggests unmanaged cooling growth could play a significant part in keeping fossil-fueled sources of electricity on the system.

Systemic solutions

There are abundant solutions to managing cooling demand in a warming world, while allowing for increased access.

The most rapid option is the introduction and better enforcement of more stringent efficiency standards for equipment. Adopting standards equivalent to the most efficient AC available on the market today could halve 2050 energy demand for space cooling.

Finding ways to reduce reliance on "conventional" cooling is also likely to be needed if the world is to meet its climate goals, while ensuring access to cooling grows.

This could include a mix of "responsive" cooling equipment and cold storage to manage peak demand for electricity, as well as smarter building codes incorporating passive cooling design and cooler urban planning.

It also includes simple solutions such as more reflective "cool roofs" and shifting the delivery of cooling to district energy systems in cities and off-grid systems in remote areas.

Delivering these solutions will require regulation, finance and business models – for example "cooling as a service" – sensitive to national and local contexts and geared to meeting cooling requirements.

It will also mean including all those with a stake in the need for and provision of cooling services across environment, health, agriculture, productivity, innovation and trade.

The critical first step is to recognise the strategic significance of cooling, not only in relation to climate mitigation and resilience to warming, but also for security and prosperity.

Authors: Pedro Guertler, programme leader for heat, cooling and energy efficiency at independent climate thinktank E3G and leads its work for the Kigali Cooling Efficiency Program. Larissa Gross, E3G research manager for cooling.

Taiwan Environmental Information Center (TEIA), 8 August 2019

7. The worst wildfires can send smoke high enough to affect the ozone layer



For the first time, scientists have seen exactly how towering clouds that rise from intense wildfires launch smoke high into the atmosphere, where it can linger for months and mess with the protective ozone layer.

Cooler air closer to Earth's surface normally keeps smoke from rising too high. But as dozens of fires raged in western Canada and the U.S. Pacific Northwest in the summer of 2017, they created their own giant storm clouds called pyrocumulonimbus, or pyroCb, clouds. Within two months, these clouds had lofted smoke 12 to 23 kilometers up into the stratosphere, researchers report in the Aug. 9 *Science*. Solar radiation heating soot in the smoke helped it reach those soaring heights.

Using satellites, weather balloons and ground-based remote sensing, the team tracked the smoke over the Northern Hemisphere, measuring the levels of organics and black carbon, or soot. Smoke persisted in the stratosphere for about eight months, says Pengfei Yu, a climate scientist at Jinan University in Guangzhou, China.

Although smoke has been observed in the stratosphere before, this “mother of all pyroCbs” offered the first direct observation of a process called “self-lofting,” says coauthor Alan Robock, a climate scientist at Rutgers University in New Brunswick, N.J.

The observations confirmed what simulations had suggested would happen if large amounts of smoke were injected into the stratosphere via a nuclear war, the team says. “Nature did the experiment for us,” Robock says, confirming the “nuclear winter” scenario, in which smoke in the stratosphere from a city burning would have far-reaching and long-lasting climatic consequences, including blocking out sunlight and affecting ozone.

Understanding the fate of smoke particles at high altitude “is very important for climate research,” says Yafang Cheng, an atmospheric chemist at the Max Planck Institute for Chemistry in Mainz, Germany, whose research has shown that significant amounts of wildfire soot get into the stratosphere.

Importantly, Yu and his colleagues showed that “smoke in the stratosphere hangs around a long time,” says Loretta Mickley, an atmospheric chemist at Harvard University. The longer the smoke stays in the stratosphere, the more time that organics in the smoke layer have to absorb sunlight or reflect it back into space. When major volcanic eruptions have caused such solar reflection, she says, the dimming effect has led to crop failures and famines.

It's unlikely that wildfires could loft enough smoke to cause a hemispheric dimming effect. But the smoke can damage the ozone layer, which protects Earth from too much harmful ultraviolet radiation from the sun, in two different ways.

Most immediately, as ozone-poor smoke rises into the stratosphere, it pushes out ozone-rich air, causing a temporary loss of ozone in that area, Yu says. Using sensitive instruments aboard the CALIPSO satellite, Yu's team measured ozone losses up to 50 percent over parts of Canada during the 2017 fires.

In addition, chemical reactions with water vapor transported into the stratosphere by wildfire smoke that take place over time can also damage ozone. When water vapor breaks down, it releases reactive hydrogen oxide molecules called radicals that destroy ozone. “Although we can't say the observed ozone [loss from these fires] is due to chemistry,” the risk of ozone loss occurring rises if more smoke reaches into the stratosphere, Yu says.

How significant those ozone losses may be “is a big question mark right now, but is being actively studied,” says study coauthor Michael Fromm, a meteorologist at the Naval Research Laboratory in Washington, D.C. PyroCbs occur from three to six dozen times a year globally, Fromm says. But these fire clouds range in size, with the biggest and most intense ones requiring “a perfect storm” of hot, dry, windy conditions along with clusters of very hot fires in close proximity in order to reach the stratosphere, he says.

Given that climate change is increasing fire frequency and intensity in some places like the North American West (SN: 12/22/18, p. 18), we can probably expect to see more of these fire clouds reaching the stratosphere, Fromm says. But, he cautions, “we are still on the learning curve when it comes to understanding pyroCbs.”

Science News, 8 August 2019, By: Megan Sever

8. A synthetic view of the GWP of refrigerant fluids, versus their cooling capacity and flammability

The Kigali amendment to the Montreal Protocol and other regulations like the EU F-gas are controlling the use of some refrigerant fluids: elimination of the ODS's (Ozone Depleting substance) and restrictions on the use of HFC's. Alternative solutions include natural refrigerants, HFC's with lower GWP, new generation synthetic fluids such as HFO's, and blends of the above. Some of these are flammable to a certain extent. Some regulations are already in force, but the regulatory context is still evolving. Per the Kigali amendment, individual countries have flexibility to adjust the ways to meet their obligations. In EU, the F-gas should be updated within a few years. In US, regulations are different depending on the states. Standards and codes about flammable refrigerants are still being discussed.

There is also a growing awareness of the importance of energy consumption, resulting in more stringent energy efficiency regulations. All this generates some confusion. Therefore, it was felt useful to try to clarify some of the underlying issues.

In this paper, the main compounds used as refrigerants, pure or blended, are first presented, then the principles behind their blending to achieve desired properties, and eventually a synthetic view on the various solutions available, with emphasis on the trade-offs between the GWP of the fluid, their volumetric cooling capacity, the GWP and the energy efficiency.

To present the results, various fluids are spotted on a graph with the GWP on the vertical axis, and critical temperature on the horizontal axis. The reason for this choice is that the critical temperature TC is a good proxy to the volumetric capacity of a fluid. Ranking them by TC corresponds quite well with the ranking by volumetric capacity [...]

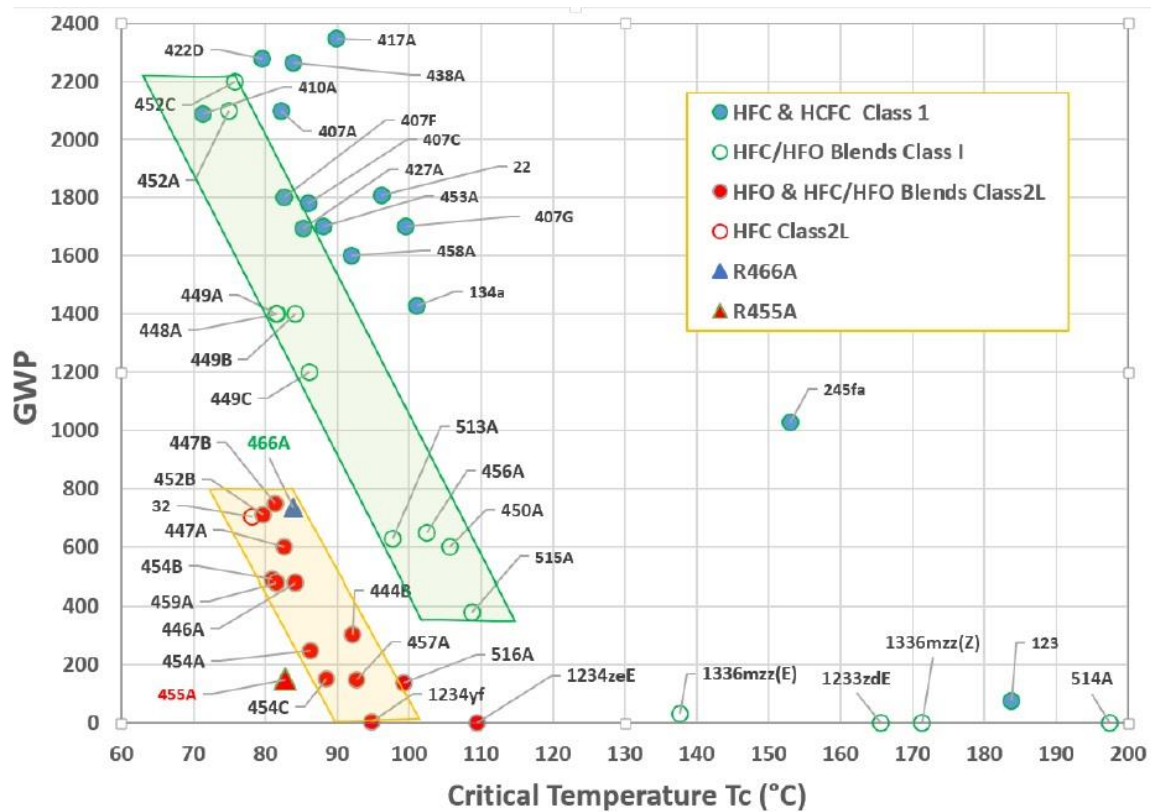


Figure 1: GWP versus Critical Temperature of fluids

It is known that high pressure fluids tend to have a higher GWP than low pressure ones, but lower GWP is feasible by including HFO's in the blends instead of blending HFC's only. Other components like CO₂ or CF₃I can also be added to reduce the flammability. The graph as presented shows the trade-offs between capacity, flammability and GWP. Incidentally, it also shows that it make little sense to try to define absolute categories of GWP such as "low", "medium", "high" etc, or use targets of "average" GWP values common to all applications. Whatever the limit chosen, it might be impossible to reach for some applications, or be pleaded as an excuse to using sub-optimal solutions in other cases.

Excerpt from the article authored by Paul de Larminat, in the *Industria & Formazione* (n. 6/19 in Italian language), pages 26-29- English text can be requested [here](#)

Industria & Formazione (n. 6/19 in Italian language), August 2019

9. Life cycle cost-benefit analysis of refrigerant replacement based on experience from a supermarket project - Study

Abstract

The Kigali Amendment to the Montreal protocol calls for the phase-down of hydrofluorocarbons (HFC).

With natural refrigerant gaining momentum worldwide, it is important to ascertain if the use of natural refrigerant reduce greenhouse gas emissions from refrigeration when the broader energy system in a cost-effective manner is considered.

This study employs a generic process chain analysis framework to examine the life cycle costs and benefits of refrigerant replacement.

The case study data are collected from a supermarket in China which has recently changed from a R22 system to a R134A-R744 system.

There are three key findings from this study. First, the values of the life cycle greenhouse gas abatement costs can be significantly influenced by the costs and emissions due to electricity usage.

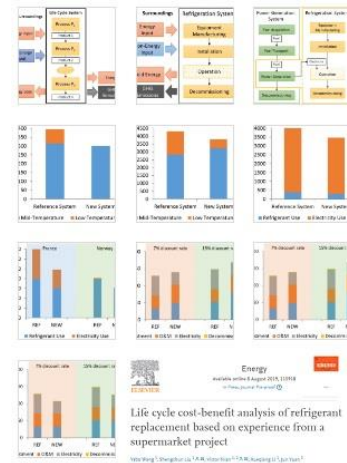
Under a 15% discount rate, the reference values of the greenhouse gas abatement cost are found to be 207.28 and 1.40 \$/t-CO_{2e} with and without the costs and emissions due to electricity use respectively.

Next, under the current state of technology development, cost reductions should be prioritised for natural refrigerant based system to become commercially attractive.

Last and most important, current natural refrigerant based systems can only be suitable replacement of aging systems and/or systems approaching obsolescence.

Authors: Yabo Wang, Shengchun Liu, Victor Nian, Xueqiang Li, Jun Yuan
 [Access to full article requires payment]

Science Direct, 8 August 2019



Asia Pacific

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

The International Solar Alliance (ISA) and the University of Birmingham are working together to help farmers in 'sun-rich' countries make the most of chilled food distribution systems powered by solar and solar-hybrid solutions.

Birmingham is the ISA's research partner on its Solar Cooling Initiative (I-SCI) which will help to spread the use of solar and solar-hybrid energy linked cold-chains and cooling systems for agricultural use in countries in the Tropics, such as India, Egypt and Brazil. For this initiative ISA is collaborating with India's National Centre for Cold-chain Development (NCCD) for domain expertise and knowledge support.

The two organisations will explore opportunities to drive forward ISA's agenda to research, plan and deliver such technologies in ISA member countries located between the Tropics of Cancer and Capricorn.



Director General ISA, H.E. Mr. Upendra Tripathy with Toby Peters, Professor in Cold Economy, University of Birmingham.

Agricultural economic growth in such countries depends upon connecting farmers with markets – cold chains are vital to transport perishable produce which can otherwise suffer up to 40% loss in the journey from farm to market.

Cold-chain connectivity and reduction in food loss would ensure that the given volume of production generates more revenue and increases farmers' economic wellbeing. However, cooling systems must be driven by sustainable technology if they are not increase the risk of climate change.

Launching the project, Director General ISA, H.E Mr. Upendra Tripathy says: "This initiative aims to enable millions of farmers by way of integrating cold-chains that work on solar fully or partially. The focus would be on farm-to-fork supply chains - reducing wastage and increasing farmers' income, leading to economic wellbeing.

"This project will align with the ISA's first programme 'Scaling Solar for Applications in the Agricultural Use'. It is noteworthy that 28 countries have joined this programme to install 270,000 solar water pumps for which ISA has launched a global aggregation and price discovery tender."

Professor Pawanexh Kohli, CEO of NCCD, explains: "I-SCI has brought immediate attention to how solar energy, which already powers the biological production from farms, can be used in key post-production activities. The initiative aims to address sustainability of farming as an enterprise as well as the sustainability aspects of the food delivery system. NCCD looks forward to working with ISA and the University of Birmingham to promulgate the knowledge and research to help this initiative fulfil its potential."

Cooling systems are typically energy intensive, use of solar powered technologies can add to energy efficiency and reduce environmental impacts. Introducing solar-derived energy hybrids would contribute to reducing global greenhouse gas emissions from food loss and waste – currently estimated at 4.4 giga ton eCO₂ each year. The I-SCI project provides a rare opportunity to simultaneously address three internationally agreed goals: the Paris Climate Agreement; the Kigali Amendment to the Montreal Protocol; and the UN's Sustainable Development Goals (SDGs).

Professor Toby Peters, Professor in Cold Economy, University of Birmingham, says: "Application of clean efficient cooling in cold-chains is vital for delivering sustainable food. It enhances the financial security of farmers, growers and fishers, as well as improving food quality, safety, nutritional content and value to consumers. It can also achieve this sustainably with minimum environmental and natural resource impact. Cold-chains can be an essential contributor to the United Nations Sustainable Development Goals and the Paris Agreement on Climate Change.

"But with rapid urbanisation, this presents a big challenge. How do you create the local and global, temperature controlled "field to fork" connectivity to feed 10bn people sustainably from hundreds of millions of small-scale farmers whose livelihoods and well-being are often dependent on only 1-2 hectares, as well as ensuring they are climate change adaptation ready and resilient.... all without using fossil fuels? Our work with the new International Solar Alliance Solar cooling initiative will set out to answer this big and urgent challenge."

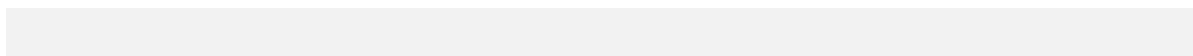
I-SCI will enable joint research into solar and solar-hybrid cooling and cold-chain solutions, solar energy storage and energy-efficient solar appliances. The National Centre for Cold-chain Development (NCCD) is the knowledge partner to this initiative. The University of Birmingham and NCCD are already collaborating on projects related to innovations in the cold-chain in India.

University of Birmingham Pro-Vice Chancellor (International), Robin Mason, comments: "Research in solar energy continues to be important for the University of Birmingham. We believe our partnership with the International Solar Alliance (ISA) will contribute significantly to the advancement of a number of initiatives, including clean cold, sustainable energy, energy storage and energy grids.

"The University and the ISA are natural allies and partners. Both support a United Nations mandate; both are working in support of numerous Sustainable Development Goals; and both are deeply committed to attaining sustainable energy security among countries in Asia and the global South.

"This partnership further affirms our University's deep and continued commitment to India. Our aim is to bring Birmingham and India closer together to deliver impactful research to tackle the energy and climate challenges of both the present and the future."

University of Birmingham, 13 August 2019



Europe & Central Asia

11. Measures on counteraction to illegal trade in ozone-depleting substances discussed in Ashgabat



A workshop for employees of the Turkmen State Customs Service was held in Ashgabat to raise their awareness in the field of regulating the import, export and transit of ozone depleting substances, Trend reports referring to the State Customs Service.

The event was organized by the Ozone Center at the Turkmen Ministry of Agriculture and Environmental Protection according to the project on the implementation of the Montreal Protocol, the phase-out plan for hydrochlorofluorocarbons (HCFCs).

At the workshop, the information on the methods of illegal trade in ozone depleting substances was given.

Turkmenistan has ratified all international agreements in this sphere. Some 99.95 percent of the main ozone depleting substances has been phased out of circulation in Turkmenistan since 1995. The Law on the Protection of the Ozone Layer was adopted in 2009, and legislative documents were developed for comprehensive control of import-export and consumption of ozone depleting substances.

Most of ozone depleting substances are gases that actively contribute to global warming. According to the experts, a decrease in emissions of ozone depleting substances has led to a great decrease in greenhouse gas emissions and, as a result, the climate change processes are constrained.

Trend News Agency, 2 August 2019, By: Huseyn Hasanov

12. NatRefs cited in Italy's first survey of HFC-alternative technologies



Italian contributions to the natural refrigerant industry include Epta's FTE CO₂ system and a strong expertise in R290 plug-in units.

In response to the Kigali Amendment to the Montreal Protocol, the Italian government has carried out its first national survey on environmentally friendly alternatives to HFCs in a number of industries, with CO₂ and R290 systems cited as major options.

The aim was to promote "made in Italy" technologies to the world, and to assist developing nations make the shift from HCFC's and HFCs to natural refrigerants, enabling them to comply with the Kigali requirements by using Italian made products and solutions.

The survey report – "[First National Census on HFC Italian Alternative Technologies](#)" – is the result of a collaboration between the Italian Ministry of Environment, Land and Sea (IMELS) and the Institute for Environmental Protection and Research (ISPRA), together with regional agencies for the protection of the environment.

It spans six sectors - refrigeration, air-conditioning, foams, fixed fire protection systems, aerosols and training. Most of the participating companies (11) are in the refrigeration sector. In the air conditioning and foam sectors, one company each responded; in fire protection, two companies; and in aerosols, none.

Contributions to refrigeration

The survey found that Italy has 17 companies offering technologies using HFC alternatives in the commercial refrigeration sector. [...]

The report states that the main Italian contribution to the development of new refrigeration technologies lies within appliance design and the manufacturing of natural solutions, including hydrocarbons and CO₂. It concludes that this expertise probably stems from the country's long tradition as a machine manufacturer and exporter.

One area singled out is the use of propane (R290) for plug-in units, both for single and multi-circuit solutions. [...]

The report also mentions Epta's Full Transcritical Efficiency (FTE) systems as an example of a patented Italian development that increases the efficiency of transcritical CO₂ systems, and opens up their use in warmer climates. This new option is made possible by decreasing the discharge temperature from FTE medium-temperature compressors by flooding the evaporators. The FTE solution "has allowed the use of the transcritical CO₂ booster at all latitudes of Europe, allowing high energy efficiency at any temperature and use for all store sizes," the report says.

The FTE systems also has installation and maintenance costs that are up to 30% lower than traditional systems, and an energy consumption that is 10% lower.

Propane chillers

Italy has a long tradition of using hydrocarbons in small self-contained air-conditioning units, [...]

Italian legislation on the use of flammable refrigerants in buildings does not address the use of A2Ls, defined as having low flammability. This presents a challenge for the sector when it comes to identifying suitable HFC alternatives in larger air-conditioning equipment, says the report. The HVAC sector has requested that international standards of flammability be implemented in Italy to improve this situation.

The report also details how production of air-conditioning equipment in Italy doesn't happen on a massive standardized scale. Manufacturers tend to specialize in small-scale production of customized solutions, with the production of heat pumps a driving element in the industry. Generally, the country produces end-user solutions, while buying its compressors abroad. [...]

The report also notes that Italian companies' commitment to research and development of new technologies "emerges as an outcome of the survey."

r744, 5 August 2019, By: Tine Stausholm

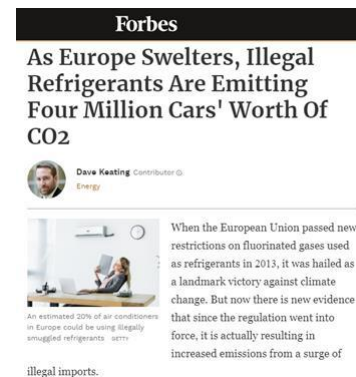
13. As Europe swelters, illegal refrigerants are emitting four million cars' worth of CO₂

When the European Union passed new restrictions on fluorinated gases used as refrigerants in 2013, it was hailed as a landmark victory against climate change. But now there is new evidence that since the regulation went into force, it is actually resulting in increased emissions from a surge of illegal imports.

Fluorinated (F) gases, used in refrigerators and air conditioners, have up to 1,000 times more greenhouse gas impact than the carbon dioxide (CO₂) emitted by cars and power stations. They were brought into use in the 1990s as a replacement for previously-used chlorofluorocarbons, banned under the Montreal Protocol because they were depleting the ozone layer. But it soon became evident that though they are better for the ozone, they are terrible for the climate.

The EU regulation, which took effect in 2015 and saw a strict import quota introduced last year, is designed to limit the use of the worst of these gases and encourage companies to switch to newer gases with lower global warming effects.

The appliance industry has said it is working on switching to new gases that have less of an impact on climate change. But they are also warning that since the market restriction was introduced, there has been a rapidly growing black market for illegally imported F-gases that violate the ban. They say these illegally smuggled



refrigerants now make up around 20% of the total EU refrigerants market – responsible for releasing up to 20 million metric tons of CO₂ per year. That's the same amount as the emissions of four million cars. [...]

Rorbes, 5 August 2019, By: Dave Keating

North America

14. US EPA Adjustments to the allowance system for controlling HCFC production and import, 2020-2029; and other updates

The EPA is proposing to allocate production and consumption allowances for specific hydrochlorofluorocarbons, a type of ozone-depleting substance, for the years 2020 through 2029. These hydrochlorofluorocarbons may be used to service certain equipment manufactured before 2020.

The EPA is also proposing to update other requirements under the program for controlling production and consumption of ozone-depleting substances, as well as proposing edits to the regulatory text for improved readability and clarity.

These updates include revising the labeling requirements for containers of specific hydrochlorofluorocarbons; prohibiting the conversion of hydrochlorofluorocarbon allowances allocated through this rulemaking into allowances for hydrochlorofluorocarbons that have already been phased out; requiring the use of an electronic reporting system for producers, importers, exporters, transformers, and destroyers of class I and class II ozone-depleting substances; revising and removing record keeping and reporting requirements; improving the process for petitioning to import used substances for reuse; creating a certification process for importing used and virgin substances for destruction; and restricting the sale of known illegally imported substances.

This notice further includes proposed clarifications to the certification requirements for methyl bromide quarantine and preshipment uses. The EPA is also proposing to add polyurethane foam systems containing ozone-depleting chlorofluorocarbons to the list of nonessential products.

Lastly, the agency is proposing to update the definition of “destruction” as used in the context of the production and consumption phaseout and remove obsolete provisions.

This document is published in the Federal Register on 08/14/2019 and available [online](#), and on [govinfo.gov](#)

[Proposed_Rule](#) | [Fact_Sheet](#)

The United States Environmental Protection Agency (US EPA), 14 August 2019



Featured

32 Years and Healing - Theme for World Ozone Day 2019



- [62nd Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol](#), 29 June 2019, Bangkok, Thailand
- [41st Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol](#), 1 - 5 July 2019, Bangkok, Thailand
- [63rd Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol](#), 2 November 2019, Rome, Italy
- [Bureau Meeting of the 30th Meeting of the Parties to the Montreal Protocol](#), 3 November 2019, Rome, Italy
- [31st Meeting of the Parties to the Montreal Protocol](#), 4 - 8 November 2019, Rome, Italy

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

[Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Status of Ratification](#)
15 October 2016 to [date](#)

The UN Environment Assessment Panels

The Assessment Panels have been vital components of ozone protection since the Montreal Protocol was first established. They support parties with scientific, technological and financial information in order to reach decisions about ozone layer protection and they play a critical role in ensuring the Protocol achieves its mandate.

The Assessment Panels were first agreed in 1988 to assess various direct and indirect impacts on the ozone layer. The original three panels are:

[The Technology and Economic Assessment Panel](#)

[The Scientific Assessment Panel](#)

[The Environmental Effects Assessment Panel](#)

In the past there were 4 main panels. The Panels for Technology and Economic Assessments were merged in 1990 into one Panel, now called the Technology and Economic Assessment Panel.

Why are the three current panels important to ozone layer protection? Each carries out assessment in its respective field. Every four years, the key findings of all panels are consolidated in a synthesis report.



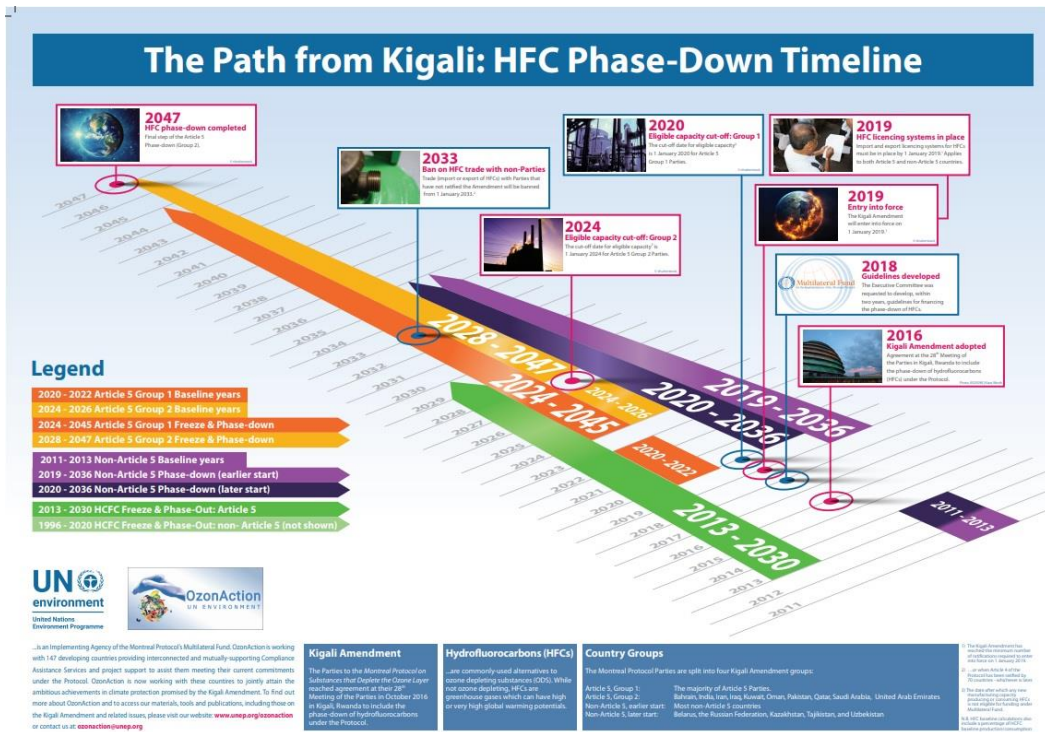
THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

- [Report of the 83rd meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, Montreal, Canada, 27-31 May 2019](#)
- [83rd meeting of the Executive Committee](#)
- [82nd meeting of the Executive Committee](#)

[Learn more](#)



OZONACTION



The Path from Kigali: HFC Phase-Down Timeline

This timeline, produced by OzonAction, highlights key hydrofluorocarbons (HFCs) phase-down dates.

Click [here](#) to download the timeline



Good Servicing: Flammable Refrigerants Quick Guide

This is the electronic and interactive version of the UN Environment OzonAction Quick Guide on Good Servicing Practices for Flammable Refrigerants. It offers easy reference to the key safety classification and technical properties of flammable refrigerants that are available in the market.

It also provides important safety guidance for the installation and servicing of room air-conditioners designed to use flammable refrigerants.

This interactive guide allows you to scroll and browse the text, jump to specific chapters or use the comprehensive dynamic index to locate specific keywords, figures and tables. The application also includes a refrigerant charge size calculator and a room size calculator for flammable refrigerants.

Available for free on the [Google play store](#) (Apple version coming soon).

Search for “UNEP Quick guide” or use the QR code



Refrigerant Identifier Video Series

Guidance on how to identify refrigerants using a refrigerant identifier.

This new OzonAction video series consists of short instructional videos showing how to use and maintain a refrigerant identifier.

The videos provide useful guidance on safety and best practice, understanding the difference between different identifier units, testing procedures and identification of results.

It is intended for use by Montreal Protocol National Ozone Officers, Customs and Enforcement Officers as well as technicians involved in the servicing and

maintenance of refrigeration and air conditioning systems.

The application features 10 short instructional videos on the following topics:

- Refrigerant cylinder types
- Types of identifiers
- Getting to know your identifier
- Safety and precautions
- Testing a sample – vapour (gas)
- Testing a sample – liquid
- Results
- Faults & error messages
- Maintaining the unit
- Software updates

Available for free on the Google play store (Apple version coming soon).

Search for “UNEP Refrigerant ID” or use the QR code

RAC Videos

Download on the App Store

GET IT ON Google Play

New videos available on the OzonAction RAC video application

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

50,000 downloads and counting!

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



GWP-ODP Calculator Smartphone Application

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

- Helps in understanding and reporting under the Montreal Protocol (and future commitments under the Kigali Amendment)
- The calculator will automatically perform the conversion between metric tonnes, ODP tonnes and/or CO₂-equivalent tonnes (or kg) and display the corresponding converted values
- The app includes both single component substances and refrigerant blends
- The components of a mixture and their relative proportions (metric, ODP,

CO₂-eq) are also displayed.

Available for **free** from the Apple IOS store and Google PlayStore. Search for “GWP ODP CALC” in the Playstore to install!

Download it Now!



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

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

OzonAction Smartphone Application WhatGas?

Available for **free** in the Google Play and Apple IOS Store

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



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

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

international scientific, health, technical, financial and national experts about background and significance of this Kigali amendment.

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

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

OzonAction Factsheets



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

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

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

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

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

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

Tools Commonly used by Refrigeration and Air-Conditioning Technicians.



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

OzonAction has launched an exciting new application which hosts series of short instructional videos on techniques, safety and best practice for refrigeration and air-conditioning technicians.

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

New videos on flammable refrigerants just added!

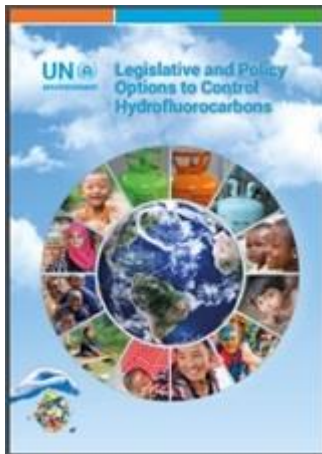
Please share with your RAC associations, technicians and other interested stakeholders...

OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series

Available in the [Android Play Store](#) and [Apple Store/iTunes](#).

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

Publications



Legislative and Policy Options to Control Hydrofluorocarbons

In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures.

This booklet contains a recommended set of legislative and policy options which the developing (Article 5) countries may wish to consider for implementation. It is intended to be a guide/tool for countries.



Latest issue of the Centro Studi Galileo - [Industria & Formazione](#). La rivista per il tecnico della refrigerazione e della climatizzazione, N. 6, 2019

Events

2019

- [25th IIR International Congress of Refrigeration](#) - 24-30 August 2019, Montreal, Canada

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

- [Refrigeration Week](#) - 16 - 20 September 2019. This year's event aims to prepare stakeholders for refrigerant change.

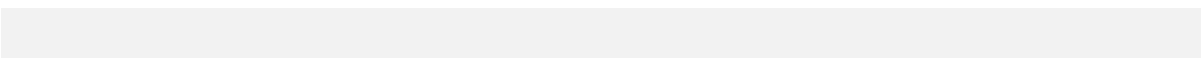
Please feel free to [share](#) with us relevant events to be featured.

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](#)





Impact of Standards on Hydrocarbon Refrigerants in Europe – Market research report. The market research report was realised for the EU-funded **LIFE FRONT** project. Amongst the main result of the market research:

- Current charge limits set in standards both restrict and obstruct the development of hydrocarbon technology
- Over 50% survey respondents already work with hydrocarbons to some extent
- Most of those planning to start working with hydrocarbons in the future will do that in 2019-2020 timeframe - revision of standards could have a major impact on the scale of this shift
- Large proportion of respondents indicated they manufacture equipment using multiple refrigeration circuits - allowing higher hydrocarbon charge limits per single refrigeration circuit would have a profound impact on cost and availability of larger units.



Tip of the Iceberg: Implications of Illegal CFC Production and Use. The Environmental Investigation Agency (EIA) recently released report urges Parties to the Montreal Protocol to address a number of remaining unanswered questions, in particular the absence of comprehensive data regarding the size of current banks of CFC-11 in PU foam and other products or equipment.



Cold Hard Facts 3 - Review of the Refrigeration and Air Conditioning Industry in Australia - The refrigeration and air conditioning industry is the largest user of synthetic greenhouse gases and ozone depleting substances in Australia. Cold Hard Facts 3 provides an economic and technological assessment of the refrigeration and air conditioning industry in Australia in 2016. The report includes an analysis of the size and economic value of the industry, the equipment and refrigerant gas bank, trends in gas imports and equipment, and direct and indirect emissions in this sector. [...] This study provides a broad view of the composition, size and value of the industry, and projections for its future. This will assist industry and policy makers with management of ozone depleting substances as they are phased out, and synthetic greenhouse gases, including hydrofluorocarbons (HFCs) which are being phased down from January 2018.

Miscellaneous



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

The United Nations Environment, OzonAction, in collaboration with Marco Gonzalez and Stephen O. Andersen are updating and expanding the “**Montreal Protocol Who's Who**”.

We are pleased to invite you to submit your nomination*, and/or nominate Ozone Layer Champion(s). **The short profile should reflect the nominee's valuable work related to the Montreal Protocol and ozone layer protection.**

Please notify and nominate worthy candidates through the **on-line form**

We look forward to receiving your nomination(s), and please feel free to contact our team for any further assistance concerning your nomination.

Take this opportunity to raise the profile of women and men who made an important contribution to the Montreal Protocol success and ozone layer protection.

- View the «Montreal Protocol Who's Who» [Introductory video](#)
- Contact : [Samira Korban-de Gobert](#), UN Environment, OzonAction

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



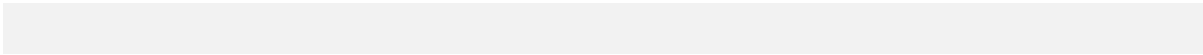
The International Institute of Refrigeration supports World Refrigeration Day - As the only independent intergovernmental organisation in the field of refrigeration, the International Institute of Refrigeration (IIR) joins associations and companies worldwide to support the initiative of an official 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.



New International Journal of Refrigeration service for IIR members -

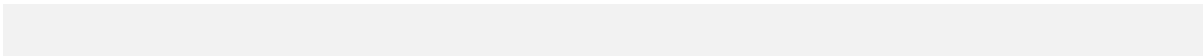
Access the complete archives of the International Journal of Refrigeration (IJR) online. Designed with IIR members in mind, this new and practical electronic subscription gives members substantial advantages:

- 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

- Easily export references, citations and abstracts.
- Print, download or share articles with colleagues or peers.
- See which papers, published in Elsevier or elsewhere, have cited any selected article.
- Consult the research highlights overview of articles in volumes from 2012 onwards.

To access this new service, click "[activate my e-IJR subscription now](#)" and follow the instructions.



International Observers - New AREA membership category - Due to the significant worldwide interest in European legislative developments and the increase in competence of personnel who handle new refrigerants, AREA is pleased to introduce its brand new "International Observer" membership category. This provides a fantastic opportunity for non-European RACHP installer bodies the world, to benefit from the expertise and discussions within Europe through access to AREA. Contact: info@area-eur.be

Ozone Hole: How We Saved the Planet



OZONE HOLE: HOW WE SAVED THE PLANET
Courtesy of Neofatal Communications

Premiere Wednesday, April 10, 2019
10:00 to 10:30 pm, ET on PBS

New Documentary Tells the Remarkable Story of how Scientists Discovered the Deadly Hole in the Ozone – and the Even More Remarkable Story of how the World's Leaders Came Together to Fix It.

OZONE HOLE: HOW WE SAVED THE PLANET - New Documentary Tells the Remarkable Story of How Scientists Discovered the Deadly Hole in the Ozone – and the **Even More Remarkable Story of How the World's Leaders Came Together to Fix It.**

New program to scale up efficient, clean cooling in developing countries- The World Bank announced today [24 April 2019] a new program to accelerate the uptake of sustainable cooling solutions, including air conditioning, refrigeration and cold chain in developing countries. The program will provide technical assistance to ensure that efficient cooling is included in new World Bank Group investment projects and mobilize further financing. Globally, demand for cooling is increasing, mainly driven by growing populations, urbanization and rising income levels in developing countries. Further exacerbating the issue, rising temperatures will increase demand for cooling appliances, which not only use large amounts of energy, but also leak refrigerants that contribute to global warming.



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

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

Prepared by: Samira Korban-de Gobert, OzonAction

Reviewed by: Dr. Ezra Clark, OzonAction

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