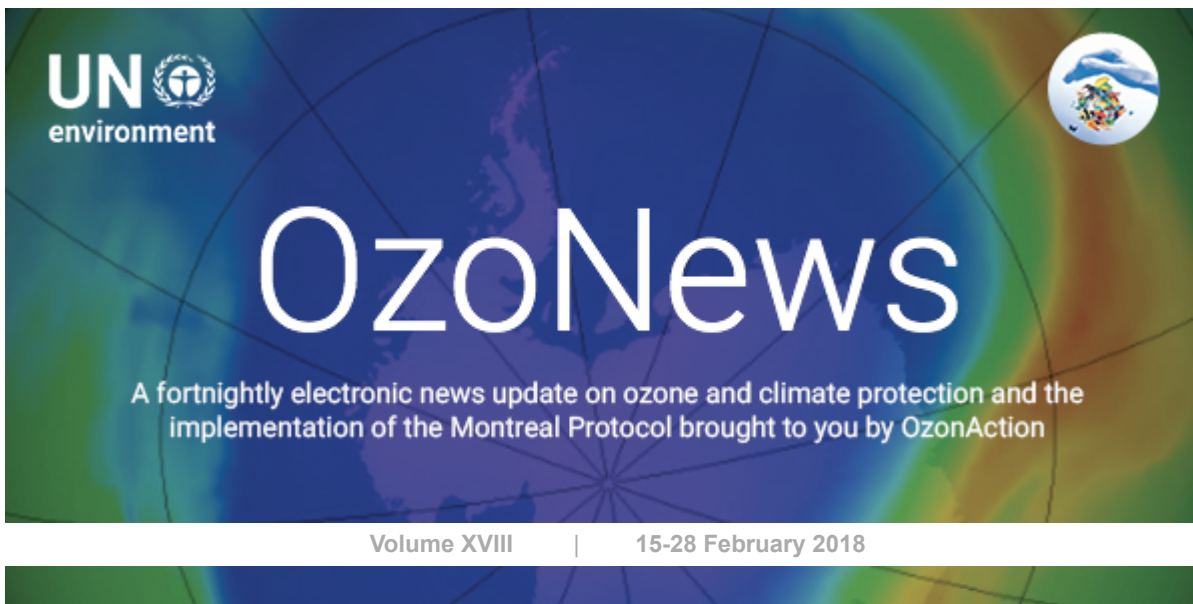


[See online](#)

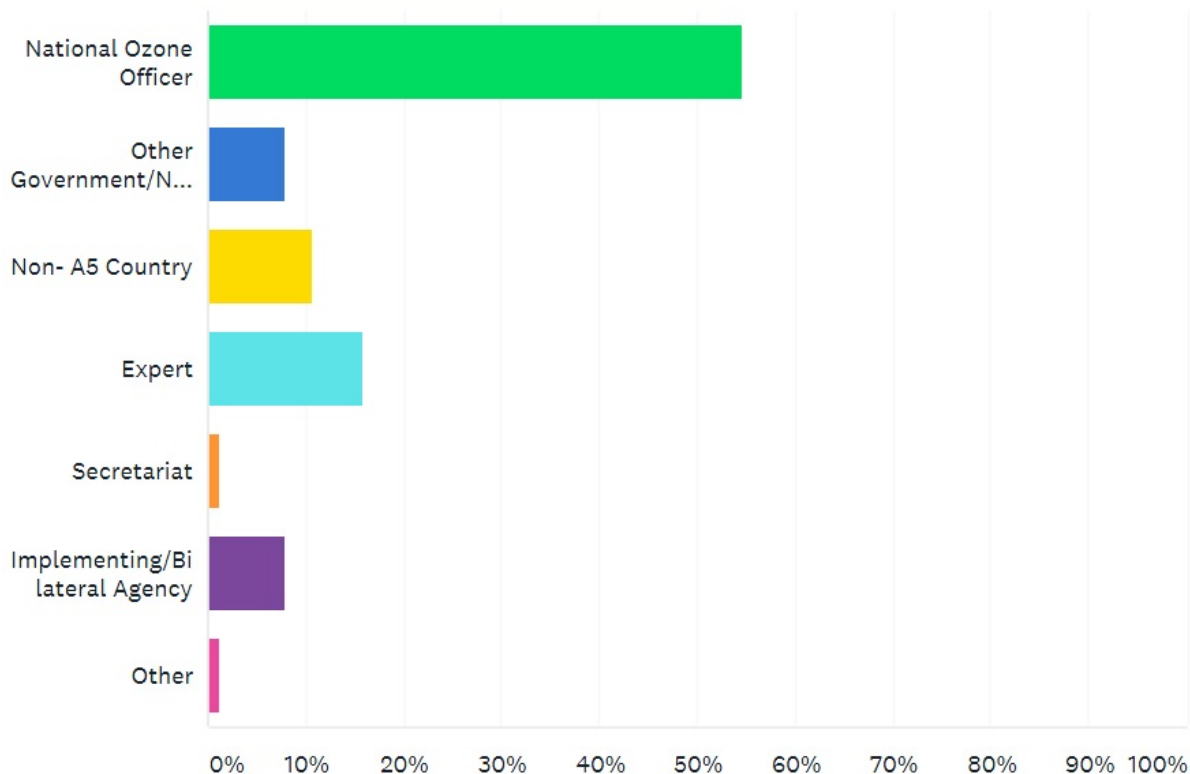


Feedback Survey Results: First Inter-Regional Thematic Technical Workshops and Regional Network Meetings for National Ozone Officers

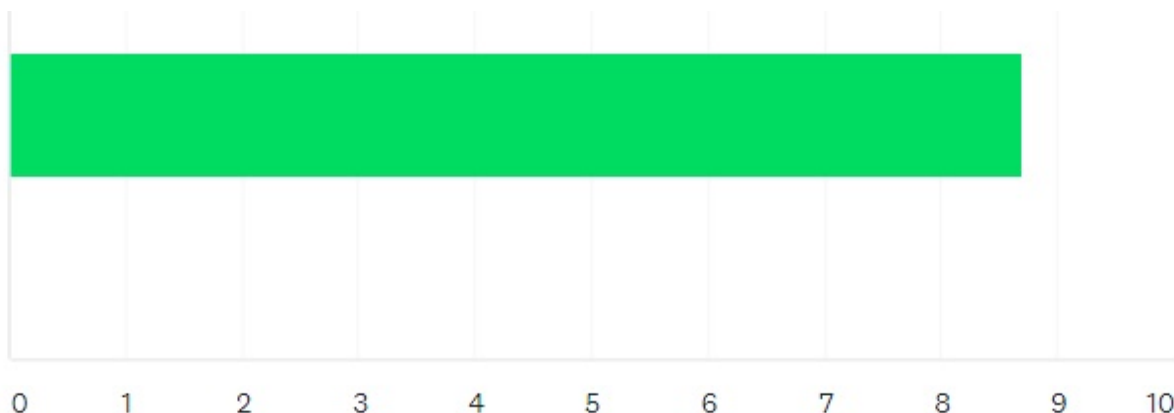


UN Environment OzonAction organised the first Inter-Regional Thematic Technical Workshops and Regional Network Meetings for National Ozone Officers, 15-19 January 2018 in Paris, France. Following the event OzonAction carried out a quick online survey to seek some guidance, feedback and understanding of the level of satisfaction of the participants in this type of meeting.

In what capacity did you participate in the workshops?



What was your overall opinion of the workshops?
(0 = poor 10 = excellent)



The feedback in general was very positive with participants scoring the meeting with an overall score of 8.6 (out of a total score of 10). OzonAction also received some very useful comments and suggestions. Full details can be seen in the analysis and brief report, which can be found [here](#)

Thank you very much to all that completed the survey.

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Global

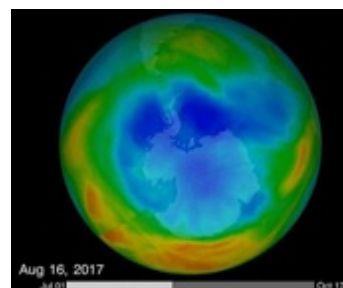
1. Ozone at lower latitudes not recovering, despite ozone hole healing

The ozone layer - which protects us from harmful ultraviolet radiation - is recovering at the poles, but unexpected decreases in part of the atmosphere may be preventing recovery at lower latitudes.

Global ozone has been declining since the 1970s owing to certain man-made chemicals. Since these were banned, parts of the layer have been recovering, particularly at the poles.

However, the new result, published in the European Geosciences Union journal Atmospheric Chemistry and Physics, finds that the bottom part of the ozone layer at more populated latitudes is not recovering. The cause is currently unknown.

Ozone is a substance that forms in the stratosphere - the region of the atmosphere between about 10 and 50 km



altitude, above the troposphere that we live in. It is produced in tropical latitudes and distributed around the globe.

A large portion of the resulting ozone layer resides in the lower part of the stratosphere. The ozone layer absorbs much of the UV radiation from the Sun, which, if it reaches the Earth's surface, can cause damage to DNA in plants, animals and humans.

In the 1970s, it was recognised that chemicals called CFCs, used for example in refrigeration and aerosols, were destroying ozone in the stratosphere. The effect was worst in the Antarctic, where an ozone 'hole' formed.

In 1987, the Montreal Protocol was agreed, which led to the phase-out of CFCs and, recently, the first signs of recovery of the Antarctic ozone layer. The upper stratosphere at lower latitudes is also showing clear signs of recovery, proving the Montreal Protocol is working well.

However, despite this success, scientists have today revealed that stratospheric ozone is likely not recovering at lower latitudes, between 60N and 60S (London is at 51N), due to unexpected decreases in ozone in the lower part of the stratosphere.

Study co-author Professor Joanna Haigh, Co-Director of the Grantham Institute for Climate Change and the Environment at Imperial College London, said: "Ozone has been seriously declining globally since the 1980s, but while the banning of CFCs is leading to a recovery at the poles, the same does not appear to be true for the lower latitudes.

"The potential for harm in lower latitudes may actually be worse than at the poles. The decreases in ozone are less than we saw at the poles before the Montreal Protocol was enacted, but UV radiation is more intense in these regions and more people live there."

The cause of this decline is not certain, although the authors suggest a couple of possibilities. One is that climate change is altering the pattern of atmospheric circulation, causing more ozone to be carried away from the tropics. The other possibility is that very short-lived substances (VSLs), which contain chlorine and bromine, could be destroying ozone in the lower stratosphere. VSLs include chemicals used as solvents, paint strippers, and as degreasing agents. One is even used in the production of an ozone-friendly replacement for CFCs.

Dr William Ball from ETH Zurich and PMOD/WRC Davos, who led the analysis, said: "The finding of declining low-latitude ozone is surprising, since our current best atmospheric circulation models do not predict this effect. Very short-lived substances could be the missing factor in these models."

It was thought that very short-lived substances would not persist long enough in the atmosphere to reach the height of the stratosphere and affect ozone, but more research may be needed.

To conduct the analysis, the team developed new algorithms to combine the efforts of multiple international teams that have worked to connect data from different satellite missions since 1985 and create a robust, long time series.

Dr Ball said: "The study is an example of the concerted international effort to monitor and understand what is happening with the ozone layer; many people and organisations prepared the underlying data, without which the analysis would not have been possible."

Although individual datasets had previously hinted at a decline, the application of advanced merging techniques and time series analysis has revealed a longer term trend of ozone decrease in the stratosphere at lower altitudes and latitudes.

The researchers say the focus now should be on getting more precise data on the ozone decline, and determining what the cause most likely is, for example by looking for the presence of VSLs in the stratosphere.

Dr Justin Alsing from the Flatiron Institute in New York, who took on a major role in developing and implementing the statistical technique used to combine the data, said: "This research was only possible because of a great deal of cross-disciplinary collaboration. My field is normally cosmology, but the technique we developed can be used in any science looking at complex datasets."

Research Paper, Atmos. Chem. Phys., 18, 1379-1394, 2018

Space Daily, 8 February 2018



2. Thinning ozone layer may have driven Earth's largest mass extinction 252 million years ago

Pine trees become temporarily sterile when exposed to ultraviolet radiation as intense as some scientists believe the Earth experienced 252 million years ago during the planet's largest mass extinction, lending support to the theory that ozone depletion contributed to the crisis.

The effect of high UV on conifers and potentially other trees also suggests caution today in introducing chemicals that deplete Earth's ozone layer, which has yet to recover after a global ban on chlorofluorocarbon refrigerants in the 1980s instituted after ozone holes developed over the poles. Some industrial chemicals also destroy atmospheric ozone, which is the planet's sunscreen, protecting all life from excessive UV rays, in particular UV-B wavelengths, which causes mutations in DNA.

Results of the experiment, which was conducted by University of California, Berkeley graduate student Jeffrey Benca, published Feb. 7 in the online journal Science Advances.

Benca irradiated 18-inch-tall, bonsai-like pines with UV-B dosages up to 13 times stronger than on Earth today, simulating the effects of ozone depletion caused by immense volcanic eruptions that occurred at the end of the Permian Period. During the two-month experiment, none of the trees died but all seed cones, or pine cones, shriveled up only days after emerging, leaving the trees sterile.

When placed outside, the trees regained the ability to produce healthy seed cones in later years. Scientists have proposed that ozone depletion caused by periodic volcanic eruptions over nearly a million years was one cause of the end-Permian extinction, but how has been unclear. Acid rain would have been a local effect, but the extinction of nearly 70 percent of known land animals, 95 percent of marine life and many plant lineages was global.

Previous paleoclimate modeling studies suggest the volcanic spurts could have wiped out the ozone layer worldwide, though temporarily. Nevertheless, even if ancient trees regained their fertility, repeated bouts of sterility could have hampered population growth over time, leading to collapse of the biosphere planet-wide, according to Benca.

Long-term biosphere collapse



"During the end-Permian crisis, the forests may have disappeared in part or fully because of increased UV exposure," Benca said. "With pulses of volcanic eruptions happening, we would expect pulsed ozone shield weakening, which may have led to forest declines previously observed in the fossil record."

"If you disrupt some of the dominant plant lineages globally repeatedly, you could trigger trophic cascades by destabilizing the food web base, which doesn't work out very well for land animals," he added.

The surprise findings tell scientists something about past extinctions and Earth's future prospects as climate change, habitat destruction and pollution set us up for Earth's sixth mass extinction. [...]

[Phys.org, 7 February 2018, University of California - Berkeley](#)



3. Ozone Layer Depletion Slows Climate Change

The depletion of the ozone layer may just be the best thing to happen to the environment in the past half-century.

This is not because of the depletion itself, but rather the wake-up call it provided the American people. The legislation written to prevent further ozone depletion went on to accidentally be the most impactful climate change legislation to date.

This legislation, specifically The Montreal Protocol passed in 1987, has aided to ease the rapid rising of global temperatures because the chemicals that deplete the ozone layer—chlorofluorocarbons (CFCs) that are used in hairsprays, refrigerators, packing materials, etc.—are also proponents of climate change.

"The phase down in the use of CFCs during the 1990s into the early 21st century, which was solely intended to reverse the loss of Earth's protective ozone layer in the upper atmosphere, has shaved nearly 0.2 degrees Fahrenheit of global warming since that time," according to Ozone Treaty Accidentally Slowed Global Warming: Study by Andrew Freedman for Climate Central. "Considering that the world has warmed by an average of about 1.6 degrees F between 1901-2012, it is not a trivial amount."

Freedman furthered that the treaties climate benefits proved to be a pleasant surprise.

"The Montreal Protocol was an effective climate treaty, albeit an accidental one," Freedman wrote.

The atrophy of the ozone layer itself, although it has a bad effect on the environment in terms of radiation, slowed climate change by allowing heat that was trapped beneath the thick atmosphere to escape through the weakened ozone.

The depletion of the ozone layer was the first time the world opened its eyes to the possibility of human activity profoundly affecting the environment. Global leaders gathered, absorbed the evidence and came to a consensus

that would battle a problem that had not yet gained traction—climate change.

This consensus, the Montreal Protocol, serves as a beautiful example of cooperation on a global scale, for the greater good of all nations.

Graphic, 2 February 2018, By: Judith-Daly Brister-Knabe



4. Accelerating the switch to climate-friendly cooling systems in Southeast Asia

The inaugural Asean Cooling Summit convened today for the first time a diverse group of leaders from business, government, civic society and academia to discuss solutions for sustainable cooling in Southeast Asia.

Growing demand for air conditioning in the world's emerging economies—such as those in the Southeast Asia region—could spur a 64 per cent increase in household energy use and produce 23.1 million tonnes of carbon emissions by 2040.

Furthermore, technology used in conventional cooling systems in air conditioners and refrigerators poses a challenge. They use potent greenhouse gases such as hydrofluorocarbons that have high global warming potential. Moving away from the use of these gases is a key component of the 2016 Kigali Amendment to the Montreal Protocol, which commits signatory countries to a timetable to replace climate-damaging refrigerants with sustainable alternatives.

The Summit explored cooling in the context of sustainable development and identified solutions to increase the adoption of energy-efficient technology, remove financial barriers, and raise awareness of the critical need for climate-friendly cooling systems.

A comprehensive new white paper, *Freezing in the tropics: Asean's air-con conundrum*, commissioned by the Kigali Cooling Efficiency Program (K-CEP) and produced by Eco-Business released during the Summit revealed the need to sound the alarm about the impact of cooling on the environment in Southeast Asia. There was little awareness of the necessity of energy-efficient cooling to meet national emission reduction targets, though one cause for hope was the widespread sentiment that buildings are sometimes cooled to excess.

The whitepaper also found that potential energy savings accrued in a year from Asean countries by switching to energy-efficient devices would be equivalent to the annual output of 50 coal-powered plants.

Dan Hamza-Goodacre, Executive Director of K-CEP, said: "Providing clean, efficient cooling for all is one of the 21st century's biggest opportunities, especially in the Asean region. Society reaps huge health and productivity benefits from cooling, but few of us realize that an air-conditioning unit is like a carbon bomb. Inefficient cooling from the use of polluting fluorinated gases could result in 1° Celsius of global warming, and this must change. Businesses know the answer, governments need to encourage change and consumers need to make smart choices about the cooling technology they buy."

"Findings from the whitepaper reveal the urgent need to tackle the cooling issue in Southeast Asia. As temperatures rise and demand for energy soars, it's critical that we look at how to change practices and mindsets of businesses and governments to make the industry more sustainable. This will help the region avoid commissioning more fossil fuel power plants that are harmful to the environment and make it difficult to fulfill pledges to the Paris Agreement. We hope that this year's Asean Cooling Summit is a good starting point for governments, businesses and the people of Southeast Asia to think critically about how they can help to tackle both cooling and climate change," said Jessica Cheam, Managing Editor of Eco-Business.

"Economic growth and rising population are increasing demand for air conditioners and refrigeration in Southeast Asia. Moving to alternatives while improving energy efficiency will save money for both consumers and governments, benefitting the region's people and economy," said Mark Radka, Chief of UN Environment's Energy, Climate, and Technology Branch.

Hosted by K-CEP, the event is organized with UN Environment and Asia's leading sustainability media organization, Eco-Business. K-CEP supports the Kigali Amendment to phase out production and consumption of hydrofluorocarbons by more than 80 per cent over the next 30 years, potentially avoiding up to 0.5° C of global warming by the end of the century. K-CEP focuses on energy efficiency of cooling and UN Environment is one of its implementing partners.

Contact:

Satwant Kaur, UN Environment Regional Office Asia Pacific

Hannah Koh, Correspondent, Eco-Business

The United Nations Environment Programme (Un Environment), 29 January 2018

North America



Environmental Topics Laws & Regulations About EPA

Significant New Alternatives Policy (SNAP)

Direct Final Rule: Protection of Stratospheric Ozone: Revision to References for Refrigeration and Air Conditioning Sector to Incorporate Latest Edition of Certain Industry, Consensus-based Standards

This action modifies the use conditions required for use of three flammable refrigerants, isobutane (R-600a), propane (R-290), and R-441A, in new household refrigerators, freezers, and combination refrigerators and freezers under the Significant New Alternatives Policy (SNAP) program. The use conditions, which address safe use of flammable refrigerants, are being revised to reflect the updated UL Standard 60335-2-24 that is incorporated by reference.

You may need Adobe Reader to view files on this page. See EPA's [About PDF page](#) to learn

(R-290), and R-441A, in new household refrigerators, freezers, and combination refrigerators and freezers under the Significant New Alternatives Policy (SNAP) program. The use conditions, which address safe use of flammable refrigerants, were being revised to reflect an updated standard from Underwriters Laboratories (UL) that would have been incorporated by reference.

The direct final rule stated that if the Agency received adverse comment by January 25, 2018, the direct final rule would not take effect and EPA would publish a timely withdrawal in the Federal Register. Because we received adverse comment on that direct final rule during that comment period we are withdrawing the direct final rule in this document. We will address all significant comments in any subsequent final action, which would be based on the parallel proposed rule also published on December 11, 2017. As stated in the direct final rule and the parallel proposed rule, there will not be a second comment period on this action.

An advance copy of the withdrawal notice is available at www.epa.gov/snap/snap-regulations under Rule 22, which will be updated once the notice is published in the Federal Register. To view the public docket, visit www.regulations.gov and search for docket number EPA-HQ-OAR-2017-0472.

US EPA, Significant New Alternatives Policy (SNAP), 28 February 2018



6. California cooling act to combat powerful greenhouse gases in refrigerants and air conditioners

California Sen. Ricardo Lara (D-Bell Gardens) introduced the California Cooling Act (Senate Bill 1013) to target dangerous gases in refrigerants and air conditioners.

Commonly known as hydrofluorocarbons, HFCs or F-gases, these super-pollutants are the fastest growing source of greenhouse emissions in California and around the world.

Senator Lara authored the Super Pollutant Reduction Act (Senate Bill 1383) in 2016, which committed California to reduce HFC emissions 40 percent by 2030 – the nation's toughest standard.

The Obama Administration ended the use of the most harmful HFCs in 2015, but the Court of Appeals for the District of Columbia overturned the rule after two foreign makers of HFCs sued. An appeals court declined to rehear the case of Mexichem Fluor v. EPA last month by environmental groups and U.S. manufacturers who have invested nearly \$1 billion in earth-friendly alternatives.

“Super-pollutants from refrigerants are one of the biggest threats to our planet’s health, contributing to climate disasters like wildfires and extreme heat events,” said Senator Ricardo Lara (D-Bell Gardens). “But we are not alone in this fight. American businesses are ready to roll up their sleeves to meet our clean air goals, and we can’t be held hostage to global polluters and lack of action by the Trump Administration. The California Cooling Act supports companies as they develop alternatives to these dangerous super-pollutants and keeps California in the lead on cleaner air.”

Last year Senator Lara and Governor Jerry Brown accepted the first ever Climate and Clean Air Award at the United Nations Climate Conference in Germany on Nov. 12, 2017, for taking bold action on HFCs and other pollutants with the passage of the Super Pollutant Reduction Act.

“We support all efforts to reduce HFCs,” said Helena Molin Valdés, head of the U.N. Environment hosted Climate and Clean Air Coalition. “By doing so we can protect our climate and at the same time move to energy efficient cooling technologies.”

Experts predict that phasing out HFCs globally will help reduce 0.5°C of warming by 2100 – reducing the risks of extreme weather events like wildfires and impact on California’s agriculture.

The California Cooling Act will maintain the momentum around reducing HFCs, including incentives for businesses and residents to switch to low-polluting air conditioning and refrigeration.

Sen. Ricardo Lara, California, 8 February 2018

Europe & Central Asia



7. ODS consumption in Belarus down 20% in 2017

MINSK, 16 February (BelTA) – The consumption of ozone-depleting substances (ODS) in Belarus was reduced by 20% in 2017, Natural Resources and Environmental Protection Minister Andrei Khudyk noted at a wrap-up session at the ministry on 16 February, BelTA has learned.

“Last year, ODS consumption in Belarus went down by 20% versus 2016,” Andrei Khudyk remarked. Belarus complies with all the commitments under international agreements on ozone layer protection.

In 2013, the country adopted a strategy on the phase-out of HCFCs (hydrochlorofluorocarbons) for the period up to 2020.

The participants of the meeting at the Natural Resources and Environmental Protection Ministry summed up the performance of the ministry in 2017. “The major targets for 2017 were met,” Andre Khudyk said.

One of the ministry's top-priority tasks is to reduce air pollution. According to preliminary estimates, the total amount of emissions from stationary and mobile sources totaled 1.243 million tonnes in 2017. Thanks to the regional authorities, over 200 environmental protection measures were taken to reduce the emissions by almost 7,500 tonnes. The plans for 2018 envisage further decrease in emissions.

Belarus News, 16 February 2018



8. F-gas violators face £200,000 fines

Those who breach the F-gas regulations in England and Scotland could face fines of up to £200,000 from April 1.

After receiving support from the industry, the Fluorinated Greenhouse Gases (Amendment) Regulations 2018 were laid before the UK Parliament on Tuesday (January 30). Subject to the expected approval, they will come into force within the next few weeks and enforcement bodies will be able to apply civil penalties from April 1. Wales and Northern Ireland have decided not to

adopt civil penalties at the moment.

The new civil penalties would apply to a range of F-gas contraventions. The deliberate release of F-gases would remain as a criminal offence but there would still be the option to apply a civil penalty in such cases instead.

The maximum fine of £200,000 could be applied to offences such as the intentional release of F-gases to atmosphere, breaches of the quota limits for placing HFCs on the market, and failure to comply with an enforcement notice.

Fines of up to £100,000 are proposed for less serious offences, such as contravening requirements and procedures for minimising emissions or leakage and recovering F-gases from equipment. It would also be levied on non-F-gas certified individuals handling F-gases or on those not fulfilling the requirements to register for and verify quota usage.

A maximum fine of £50,000 could be applied to breaches including failing to correctly label equipment, failing to comply with the requirements for declarations of conformity for importing products containing F-gases and failing to keep records of F-gases used in equipment or F-gas sales.

More minor breaches such as not reporting within the prescribed deadline on F-gas production, import, export, destruction and feedstock usage could carry a maximum fine of £10,000

A consultation carried out by Defra in November received 27 responses, the majority of whom were in favour of introducing civil penalties. Respondents felt that civil penalties would be more effective and easier and less burdensome to apply than the current criminal penalties. It would also be seen as a deterrent, where the existing criminal sanctions were not respected and did not sufficiently deter non-compliance.

CoolingPost, 3 February 2018, By: Neil Everitt

9. Dutch prosecutors press criminal charges against Seatrade



For the first time in Europe, Public Prosecutors are bringing criminal charges against a ship owner – Seatrade – for having sold vessels to scrap yards in countries “where current ship dismantling methods endangers the lives and health of workers and pollutes the environment”. The case is being heard in a Rotterdam Court this week, and the Dutch Public Prosecutor calls for a hefty fine (2.35 mill EUR) and confiscation of the profits Seatrade made on the illegal sale of four ships, as well as a six month prison sentence for three of Seatrade’s top executives. Seatrade is based in Groningen, the Netherlands, and is the largest reefer operator in the world.

In 2013, the NGO Shipbreaking Platform had revealed Seatrade’s sale of the SPRING BEAR and SPRING BOB to respectively Indian and Bangladeshi breakers. The heavy charges pressed by the Dutch Prosecutor additionally involve the scrapping of the SPRING PANDA and SPRING DELI in Turkey, and are based on international laws governing the export of hazardous waste and the EU Waste Shipment Regulation. The Regulation prohibits EU Member States from exporting hazardous waste [1] to countries outside the OECD, as well as requiring a prior informed consent for such exports. All four vessels departed on their last voyage to the breaking yards from the ports of Rotterdam and Hamburg in the spring of 2012.

Seatrade sold the ships, via the company Baltic Union Shipbrokers, to cash-buyer GMS. According to the Prosecutor, Seatrade opted for using a cash buyer, rather than recycling the ships in a safe and clean manner, for purely financial reasons. GMS is an infamous scrap-dealer specialized in bringing ships to the beaches of South Asia, where the price of end-of-life vessels is higher due to the exploitation of migrant laborers and to weak, or no, enforcement of safety and environmental standards. According to the Prosecutor, that Seatrade knowingly sold the vessels for dirty and dangerous breaking in order to maximize profits further aggravates the charge [2].

“Despite ongoing criminal investigations, Seatrade sold two more ships – the SINA and ELLAN – for dirty and dangerous breaking on the beach in Alang, India, in August 2017”, says Ingvild Jenssen, Founder and Director of the NGO Shipbreaking Platform. “This case adds itself to the growing demand, including from investors and major shipping banks, for better ship recycling practices”, she adds.

Authorities in Norway, Belgium, and the UK will be paying close attention to the verdict of the case. Similar cases are currently being investigated there, involving shipping companies such as Maersk and CMB, as well as the world’s largest cash-buyers GMS and Wirana.

[1] Ships contain many substances that are toxic within their structure, including asbestos, heavy metals and residue oils. Since Seatrade specializes in transporting refrigerated goods, all the vessels additionally contained chlorofluorocarbon (CFCs), a substance which is known to cause ozone depletion in the upper atmosphere. The Montreal Protocol (on Substances that Deplete the Ozone Layer), which entered into force in 1989, has since its adoption phased out and prohibited the use of CFCs.

[2] Earlier this year the world largest private investor, the Norwegian Oil Pension Fund, divested from four shipping companies due to their poor shipbreaking practices. They also argued that selling a vessel to a beaching yard “is a consequence of an active choice on the part of the company that owned the vessel to maximise its profit”.

Hellenic Shipping News Worldwide, 18 February 2018

West Asia



10. Bahrain opens country's first refrigerants reclamation facility

Mr. Erik Solheim, UN Environment Executive Director, and Mr. Zayed Al Zayani the Minister of Industry, Commerce and Tourism of Bahrain, along with Dr. Mohamed Bin Daina the Chief Executive of the Supreme Council for Environment in Bahrain officially opened the country's first Refrigerants Reclamation Facility. This new centre is established under the national HCFC Phase-out Management Plan (HPMP) and funded by the Multilateral Fund for the Implementation of the Montreal Protocol. The centre is organized under the auspices of the Supreme Council for Environment (SCE) of Bahrain and was locally awarded through a technical bidding process to the private sector to manage its operation. UN Environment (UNEP) is the lead agency for the implementation of the Multilateral Fund portfolio in Bahrain while the United Nations Industrial Development Organization (UNIDO) is cooperating agency.

The reclamation facility is the first of its kind in Bahrain. It will manage a local recovery network amongst servicing contractors and large end-users of refrigeration and air-conditioning applications to help ensure that refrigerants harmful to the stratospheric ozone layer and/or the Earth's climate are not vented to the atmosphere. This landmark centre will thus help protect the ozone layer and climate as well as assisting Bahrain's industry in saving hundreds ton of substances that are needed for installing and servicing refrigeration and air-conditioning applications every year.

At present, the facility has an operational capacity to recycle and reclaim up to 400 tons of refrigerants per year, however Bahrain plans to triple that capacity within the first two years of operation. The recovery network that will be managed by the facility includes the provision of portable refrigerant recovery units and recovery cylinders that will be distributed to large servicing contractors and end-users to help build the momentum of the reclamation business. This will open the gates for new jobs and career opportunities within the refrigeration and air-conditioning industry in Bahrain, noting that one reclaimed ton of refrigerant equals savings that range from US\$ 3,000 – 10,000 for local industry, depending on the type of refrigerants being recovered and reclaimed. The environmental benefits of the centre's operation are estimated to be in the range of eliminating 1,300 – 4,400 tons of CO₂-equivalent emissions for each ton of refrigerant reclaimed.

UN Environment, through its OzonAction team in the West Asia Office, is supporting SCE in building the regulatory and monitoring framework necessary for the efficient operation of the national reclamation scheme, which includes developing specific bylaws for prohibition of venting, limiting the use of non-refillable cylinders, certifying technicians, defining reporting requirements and monitoring the operation of the reclamation scheme and the facility. UNIDO is supporting SCE with the process of supplying, commissioning and testing the equipment at the reclamation facility.

Contact: [Ayman Eltalouny](#), Regional Montreal Protocol Coordinator, OzonAction Compliance Assistance Programme, UN Environment, West Asia Office

11. Saving Ozone: SCE, Tamkeen sign training deal



In line with Bahrain's commitment to phase out ozone-depleting substance, the Supreme Council for Environment (SCE) has signed a memorandum of understanding (MoU) with the Labour Fund "Tamkeen" to train technicians working in the cooling and conditioning field on the European F-gas Regulation.

The move is aimed at spreading the best practices in cooling and air conditioning maintenance as well as to prevent the emission of ozone-depleting gases.

"This agreement embodies the social partnership between the different public institutions and the industrial and service sectors, within an initiative that aims to better serve the community," said Chief Executive of the Supreme Council for Environment, Dr Mohammed Mubarak Bin Dainah.

The deal, Dr Bin Dainah, said is a strategic step towards Bahrain's contribution towards phasing-out ozone-depleting substances.

Tamkeen's Chief Executive Dr Ebrahim Mohammed Janahi stressed, "This training meets the developmental aims of the Kingdom in light of the best practices, which will positively impact each of the economic and environmental aspects."

DT News, 27 February 2018



12. Second phase of management plan to reduce ozone depletion launched (Jordan)

The Ministry of Environment on Tuesday launched the second phase of a management plan for the phase out of hydrochlorofluorocarbons (HCFCs), which cause ozone depletion.

The second stage covers the period 2018-2022, according to officials, who said that it aims at reducing HCFCs consumption by 50 per cent of the baseline determined by a study.

The phase out of HCFCs commenced in 2013 with the aim of phasing out HCFCs in Jordan by 2030, head of the ministry's climate change department Dina Kisbi said.

"The first phase covered the air conditioning sector's shift from the use of R22 gas to 410a. The second phase, with an additional financing of some \$3,074,691 million, is to reduce the use of HCFCs represented as 141b and pre-blended polyol in the foam sector," Kisbi told The Jordan Times on Tuesday.

She noted that the implementing agencies will be UNIDO, which will handle the spray foam sector along with the servicing sector, and the World Bank which will handle the panels, domestic and commercial refrigeration.

"The additional financing to the Jordan Ozone Depleting Substances (HCFC Phase-Out Project) has been provided by the Multilateral Fund to help Jordan reduce HCFC consumption to 50 per cent of its baseline..., by January 1, 2022," Kisbi underlined.

Jordan is a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer, an international treaty designed to protect the ozone layer by phasing out the production of a number of ozone-depleting substances.

The Jordan Times, 27 February 2018, By: Hana Namrouqa



13. Middle East's first CO₂ supermarket opens in Jordan

Opened today [27 Feb.], the store uses parallel compression and ejector technology to cope with high ambient temperatures common in the Middle East.

The first transcritical CO₂ supermarket in Jordan was inaugurated today at the Al-Salam supermarket in the Middle Eastern country's capital of Amman.

The CO₂ transcritical system installed in Amman, a pioneer in the Middle East, is designed to cope with temperatures reaching up to 32°C between June and

September, thanks to the use of parallel compression and multi-ejector technology. With a total surface of 2000 m², this supermarket represents a test for CO₂ in challenging weather conditions. If successful, it could open door to the expansion of CO₂ across the Region.

The supermarket, which previously used a chemical refrigerant that is known to deplete the ozone layer and have a high global warming potential, was retrofitted to CO₂ with help from the Jordan Ministry of Environment. The demonstration project was funded by the Climate and Clean Air Coalition (CCAC) and the UN Industrial Development Organization (UNIDO).

“The project implements the first transcritical CO₂ refrigeration system in the entire region in a supermarket and is truly state-of-the-art technology,” Sulafa Mdanat, UNIDO’s Country Representative in Jordan said “The technology is spreading very fast in the world as it is considered one of the most energy efficient and climate-friendly refrigeration technologies for the retail sector”.

Nayef Al Fayez, Minister of the Environment for Jordan, hopes to share the results with others in the region soon.

“We are proud to confirm that Jordan is a global pioneer in [...] refrigeration technologies and we commend the efforts from the local companies in moving ahead towards more efficient refrigeration technologies,” Dina Kisbi, Director of Climate Change Directorate, Ministry of Environment Jordan explained.

The CO₂ booster system is from Italian manufacturer Enex S.r.l., using Dorin compressors and Danfoss’s multi-ejectors. Local firm Abdin Industrial designed, manufactured and installed the display cabinets. This Jordanian company will also be responsible for the future service of this technology.

“The fruitful cooperation of Abdin and Enex shows that local manufacturers and suppliers of commercial refrigeration equipment are able to leapfrog towards the latest CO₂ refrigeration technology”, Dr Armin Hafner of SINTEF (Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology in Trondheim, Norway) and technical adviser on this project said.

The system also features non-superheated evaporator technology for both chilled and frozen food cabinets and storage rooms. The waste heat from the system is recovered for hot sanitary water supply, which increases the energy efficiency of this system further.

“The new refrigeration system in the supermarket in Amman, Jordan, is able to maintain chilled food at the set-point temperatures with an evaporation temperature of -2°C, while the frozen foodstuff is cooled by evaporating carbon dioxide at -25°C”, Hafner added.

Alfa Laval, LU-VE and Temprite also supplied some of the components for this project.

R744, 27 February 2018, By: Charlotte McLaughlin

Featured



**OZONE
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OZONE SECRETARIAT

- Vienna Convention and Montreal Protocol Meetings: A Primer - [Read/Download](#)
- [29th Meeting of the Parties to the Montreal Protocol](#)
- [28th Meeting of the Parties to the Montreal Protocol](#)
- Final text of the Kigali Amendment to the Montreal Protocol available in all the six official UN languages ([A](#) [C](#) [E](#) [F](#) [R](#) [S](#))
- OEWG 39: The 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.
- 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](#)

SYNTHESIS REPORTS

- [2014 assessments](#)
- [2010 assessments](#)
- [2006 assessments](#)

[Assessment Panels List of Meetings](#)



THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

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

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OZONACTION

UN environment | **OzonAction MEETINGS**

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OzonAction Scoop- A tri-annual newsletter by UN Environment, OzonAction under the Multilateral Fund for the Implementation of the Montreal Protocol.
Issue#1 | Issue#2



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



Click [here](#) to access **OzonAction Series of Fact Sheets** relevant to the **Kigali Amendment**.



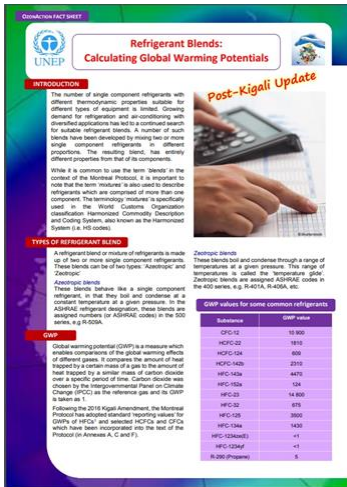
HS codes for HCFCs and certain other Ozone Depleting Substances ODS (post Kigali update)

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 - 47,000 download to date -

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

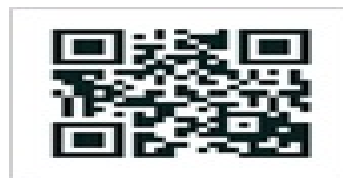
This application, consisting of short instructional videos on techniques, safety and best practice, serves as a complementary training tool for refrigeration and air-conditioning (RAC) sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training.

Additional videos will be added regularly.

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

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

Available in the **Android Play Store** and **Apple Store/iTunes**.
(Just search for "OzonAction", or scan this QR code)



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

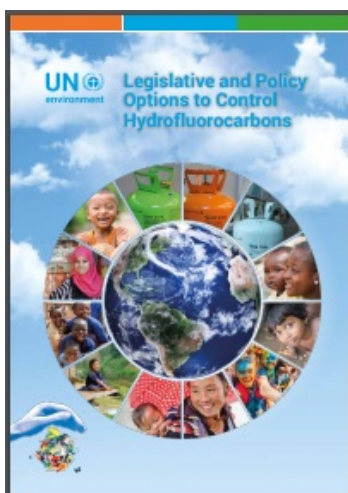
This new application launched by OzonAction on February 12, includes publications, videos, fact sheets and other awareness materials to help National Ozone Units (NOUs) and other stakeholders to build their capacity to implement the Montreal Protocol in a sustainable manner and at the same time to derive climate benefits.

OzonApp eDocs+ available in the **Android Play Store** and **Apple Store/iTunes**.
(Just search for "OzonAction", or scan this QR code)



Publications

Twinning of National Ozone Officers and Energy Policymakers - Under the Kigali Cooling Efficiency Program (K-CEP), UN Environment is implementing a two-year "twinning" project to build the capacity of National Ozone Officers and national energy policymakers for linking energy efficiency and Montreal Protocol objectives in support of the Kigali Amendment.



Legislative and Policy Options to Control Hydrofluorocarbons

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

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

Events

2018

- The **2018 World Cold Chain Summit to Reduce Food Loss**, 7-8 March 2018, Ho Chi Minh City, Vietnam,
- **MCE 2018 | Free CSG Conference "The Transition to Alternative Refrigerants"**, 15 March 2018, Fiera Milano, Rho, Italy
- **AIRAH Refrigeration 2018**, 26 – 27 March 2018, Sydney, Australia
- **A Cool World: 1st International Congress on Clean Cooling**, 18 -19 April 2018, University of Birmingham, United Kingdom
- **12th Conference on Phase-change Materials & Slurries for Refrigeration & Air Conditioning**, 21-23 May 2018, Orford, Quebec, Canada
- **13th IIR-Gustav Lorentzen Conference on Natural Refrigerants**, 18-20 June 2018, Valencia, Spain
- **1st IIR International Conference on the Application of HFO Refrigerants**. 2-5 September 2018, Austin Court Conference Centre, Birmingham, United Kingdom.

See other [IIR upcoming events](#)

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.

The dictionary in numbers:

- more than 4,300 terms in English and French, including 800 synonyms,
- around 3,500 definitions in English and French,
- approximately 7,800 terms, synonyms and definitions
- content in 11 languages.

This international tool is the result of the work of nearly 200 experts, members of the IIR network, from around 30 countries throughout the world.

The dictionary's content covers all areas of refrigeration such as:

- basic principles (thermodynamics, transfer of heat and mass ...)
- production of refrigeration (refrigerated systems, refrigerants...)
- refrigerated installations
- methods of chilling, refrigeration and freezing
- storage, transport and distribution
- refrigeration applications for perishable products and the agro-food industry
- air conditioning

- heat pumps
- cryogenics
- environment

Access the International Dictionary of Refrigeration on the IIR [website](#)



Refrigerants: There is still no vision for sustainable solutions

by Risto Ciconkov

Letter to the Editor, International Journal of Refrigeration

Abstract and highlights

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" as part of the 30th Anniversary of the Montreal Protocol celebration.

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

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

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

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

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

- View the «Montreal Protocol Who's Who» **introductory video**
- Contact : **Samira Korban-de Gobert**, UN Environment, OzonAction

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



New *International Journal of Refrigeration* service for IIR members - 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.
- Unlimited access to seminal contributions to the field of refrigeration dating

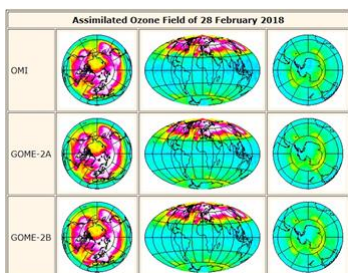
back to 1978.

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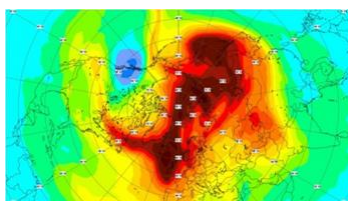
- See which papers, published in Elsevier or elsewhere, have cited any selected article.
 - Consult the research highlights overview of articles in volumes from 2012 onwards.
- To access this new service, click "[activate my e-JJR subscription now](#)" and follow the instructions.



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



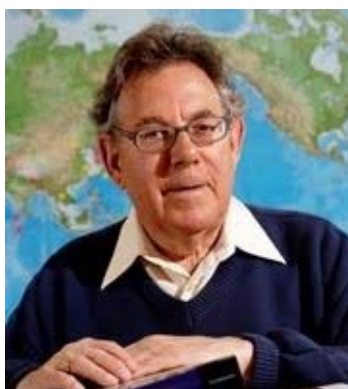
TEMIS -- Near-real time global ozone field. The in near-real time delivered total ozone columns, derived from satellite observations, are input to a data assimilation program which provides global ozone fields for today and a forecast for the coming days.



Copernicus Atmosphere Monitoring Service. Since 7 February, CAMS has predicted the appearance of an ozone mini-hole over western Canada around 12-13 February. The 5-day forecast from the ECMWF Copernicus Atmosphere Monitoring Service (CAMS) showed the location of this ozone mini-hole and predicted its shape and size. This prediction was broadly consistent with other leading global atmospheric composition forecasting centres. Satellite observations acquired on 12 and 13 February data assimilation actually confirmed these predictions. "It is a nice way for us to show that our models really work and can accurately predict these kinds of events," says Mark Parrington, senior scientist for CAMS...



US EPA GreenChill Webinar "**Clearing the Hurdles: Top 3 Ways NASRC is Removing the Barriers to Natural Refrigerants**",
Date: Tuesday, March 6, 2017
Time: 2:00 pm to 3:00pm (Eastern time)



Call for nominations for the "Paul Crutzen 2018 Award for Young Scientists of the International Commissions on Atmospheric Chemistry and Global Pollution" by iCACGP of IAMAS.

The purpose of the award is to promote scientific innovation in atmospheric sciences for the protection of the environment.

The person nominated for the Award should be the first author of at least one cited paper with significant innovation and impact. An early career scientist is defined for this award as a researcher within 7 years of completing a Ph.D. or equivalent degree. If parental leave falls into this period, up to one year may be

added per child where appropriate. The nominee should meet the above criteria by the first of June of the year when the award is competed.

Nomination Procedure

A complete nomination packages must be e-mailed in one e-mail to the two following e-mail addresses: mariak@uoc.gr; christian.george@ircelyon.univ-lyon1.fr under the subject heading: 'Nomination for the iCACGP Paul Crutzen Award 2018'

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

If you wish to submit articles, invite new subscribers, please contact:

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