



OzonAction

OZONNEWS



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In this issue

- 1. Invitation to the OzonAction Side Events at the 39th OEWG, Wednesday 12th July at 13:00**
- 2. Visit the OzonAction Information Booth at 39th OEWG**
- 3. Upcoming Workshop on Safety Standards Relevant to the Safe Use of Low Global-Warming-Potential (GWP) Alternatives, Bangkok, Thailand, 10 July 2017**
- 4. Expert Reaction to Study Looking at Dichloromethane and the Ozone Layer**
- 5. AHRI Publishes First Flammable Refrigerant Report**
- 6. The Ozone Awards 2017: Call for Nominations**
- 7. Ozone Protection and Synthetic Greenhouse Gas Management Legislation Amendment Bill 2017**
- 8. Dominica Seeking to Control Importation of Ozone Depleting Substances**
- 9. Research on Chlorofluorocarbons Designated as Chemical Landmark**
- 10. Garden Grove Businessman Suspected of Importing Ozone-Depleting Chemical**
- 11 The Sacramento Municipal Utility District Launches Natural Refrigerant Incentive Program**
- 12. Strawberry Production in Post-Methyl Bromide World**
- 13. 220,000 Technicians to Receive Low-GWP Refrigerant Training**



Multilateral Fund
for the Implementation of the Montreal Protocol

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



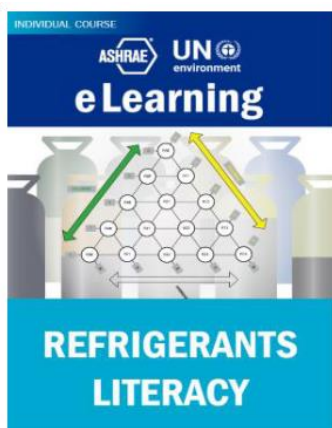
GLOBAL

1. Invitation to the OzonAction Side Events at the 39th OEWG, Wednesday 12th July at 13:00

Time: 13:00-14:45

Venue: United Nations Conference Centre, Bangkok Thailand

OzonAction and ASHRAE are presenting a two-part side event to showcase two of their successful joint activities:



Refrigerants Literacy eLearning Course

This side event will present and launch an exciting new initiative which UN Environment and ASHRAE partnered to produce a web-based course entitled “Refrigerants Literacy.” The course is designed for all involved in refrigerant policy and management, including policy makers, facility managers, and specialists.

The course is ideal for NOUs and all those involved in the Montreal Protocol.

Come and find out about the course and how you can take part...



Sustainable RAC Technologies for Marine and Off-Shore Fisheries Sector

On 6-8 April 2017 UN Environment and ASHRAE in partnership with IIR & UNIDO organised the first ever conference on Sustainable Management of Refrigeration Technologies in Marine and Off-Shore Fisheries Sector.

The side event will present the main outcomes and key findings of the conference, as well as presenting updates and challenges in this important and complex sector.

A light lunch will be provided.

ALL ARE WELCOME!!!

2. Visit the OzonAction Information Booth at 39th OEWG

During the forthcoming 39th Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol and Workshop on the Safety Standards Relevant to the Safe Use of Low-GWP alternatives to HFCs, in Bangkok, Thailand, UN Environment OzonAction will be hosting its Information Booth.

This booth will provide, as we always do, the latest OzonAction capacity building and information products and tools.

All delegates are invited to visit the booth to obtain factsheets, posters, publications, videos etc. – available in paper or on USB sticks. You can also



learn about and download the latest OzonAction smartphone applications.

The exhibition booth will be open, between the 10th and the 14th July.

We look forward to seeing you there!

3. Upcoming Workshop on Safety Standards Relevant to the Safe Use of Low Global-Warming-Potential (GWP) Alternatives, Bangkok, Thailand, 10 July 2017

The workshop on safety standards relevant to the safe use of low global-warming-potential (GWP) alternatives to hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) is convened in accordance with decision XXVIII/4 taken by the parties to the Montreal Protocol on Substances that Deplete the Ozone Layer at their Twenty-Eighth Meeting held in Kigali (10-15 October 2016). In paragraph 2 of the decision, the parties requested the Secretariat “to organise a workshop on safety standards relevant to the safe use of low GWP alternatives, back-to-back with the thirty-ninth meeting of the Open-ended Working Group, within existing resources.”

The parties, while taking this decision, recognised “the importance of the timely updating of international standards for flammable low global-warming-potential (GWP) refrigerants” and supported “the promotion of actions that allow for the safe market introduction, manufacturing, operation, maintenance and handling of zero GWP and low GWP refrigerants that are alternatives to hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs).” They also expressed support for “the timely revision of relevant standards in a manner that is technology-neutral to enable the safe use and market penetration of low GWP alternatives” (decision XXVIII/4).

The workshop will provide an opportunity for informed discussions on technical and policy aspects related to the safe use of flammable refrigerants as alternatives in the refrigeration, air conditioning and heat pump (RACHP) sectors. The workshop focuses only on one aspect of safety standards: flammability. It does not cover toxicity or high pressure because the existing standards are widely considered suitable when applied to low GWP refrigerants. It also focuses mainly on issues related to the setting of standards; it does not extensively address the safe handling of flammable refrigerants by technicians.

The workshop will involve wide stakeholder participation, including representatives of standards organizations, industries, institutions, associations and technical experts. Overview speakers and panelists will provide technical and policy clarifications on the process of setting and revising standards. The conclusions of the workshop will be presented for further consideration and discussion by the parties.

▶ [Learn more](#)

▶ See also:

- 39OEWG : Annotations to the provisional agenda - UNEP/OzL.Pro.WG.1/39/1/Add.1 - Advance copy ([E](#))

- 39OEWG : Issues for discussion by and information for the attention of the Open-ended Working Group of the Parties to the Montreal Protocol at its thirty-ninth meeting - Addendum ([E](#))

- 39OEWG : Kigali Amendment: operational plan ([E](#))

4. Expert Reaction to Study Looking at Dichloromethane and the Ozone Layer

Publishing in *Nature Communications* researchers report that levels of dichloromethane – chemicals previously assumed not to be a threat to the ozone layer – have increased in concentration in the atmosphere, and authors suggest they may be contributing to ozone depletion.



Dr Paul Young, Lecturer and Atmospheric Scientist, Lancaster Environment Centre, Lancaster University, said:

“The control of the ozone depleting substances by the Montreal Protocol, and the subsequent healing of the ozone layer is a great environmental science and environmental policy success story. By preserving the ozone layer, the Montreal Protocol has avoided catastrophic ozone loss and large surface UV increases that would have precipitated human and ecosystem health disasters.

“But there is always devil in the detail. This timely study points to the ozone-destroying potential of reactive, halogen-containing compounds from industrial sources that weren’t thought to be a threat to the ozone layer, and whose emissions are not controlled under the Montreal Protocol. While these compounds will not reverse the trend of ozone layer healing, their unchecked growth could result in a substantial delay in its recovery. Depending on how these emissions grow, recovery could be delayed decades beyond our previous estimates of the mid/end of this century.

“The Montreal Protocol has proven itself to be an effective mechanism for controlling the emissions of ozone depleting substances, and I imagine that the concerns raised by this study will be high on the agenda for the next Meeting of the Parties. This study is an excellent start in quantifying the risk from these emissions, and the next step will be to quantify their impacts in a range of global models in order to better guide the policy process.”

Dr Grant Allen, Atmospheric Physicist, University of Manchester, said:

“This work has been carried out by an expert atmospheric modelling team and is based on sound global measurement datasets that have robustly detected an increasing trend in atmospheric concentrations of dichloromethane. This important work shows that globally-averaged concentrations of dichloromethane have almost doubled since 2004 with important consequences for the recovery of the ozone layer, which helps to protect us from harmful UV radiation.

“The Montreal protocol, which curtailed the global use of a range of CFCs since the 1980s, acted to successfully reduce human-induced damage to the ozone layer. This new finding shows that this policy success could be undone if sources of this ozone-destroying gas are not identified and stopped immediately. The work identifies India and Southeast Asia as potential source areas, which should be prioritised for further measurement studies.

“Whatever the source (or sources) of this gas, which have yet to be properly identified, we must act now to stop its release to the atmosphere in order to prevent undoing over 30 years of exemplary science and policy work which has undoubtedly saved many lives. Scientists must now work to identify the sources of this gas and engage policymakers to mitigate emissions to prevent new damage to the ozone layer.”

Dr David Rowley, Senior Lecturer and Atmospheric Chemist, UCL, said:

“Chlorofluorocarbons, also known as CFCs, have long been known to cause the destruction of the ozone layer which protects the surface of the planet from dangerous ultraviolet (UV-C and UV-B). They are able to do so precisely because they are exceptionally chemically inert and therefore have very long lifetimes in the atmosphere. As a result they survive unchanged for years, eventually reaching the stratosphere where they are broken down by ultraviolet light releasing chlorine atoms that catalyse ozone destruction – each chlorine atom is capable of breaking down hundreds of ozone molecules. This understanding led to the highly effective Montreal Protocol of 1987 that bans the use of CFCs from industrial use.

“However, shorter lived and less exotic chemical compounds have flown under the radar. Although widely used as industrial solvents and in everyday applications like degreasing and dry-cleaning, other chlorocarbons had been assumed to break down too quickly in the lower atmosphere to reach the stratosphere. The prevailing view of the atmospheric community has therefore been that substances with short lifetimes did not present an impact to stratospheric ozone.

“This paper by Pyle and coworkers suggests otherwise. This is superb, well considered research, using the best global stratospheric forecasting model available, SLIMCAT. The conclusions are well backed up by some observational data, but of course a number of the extrapolations don’t have data – however, a sensible range of scenarios are addressed. It needs to be noticed that any extrapolations are in their very nature speculative, based upon projected emissions of in this case dichloromethane (DCM), CH_2Cl_2 . Nonetheless, the interpretations of such possible emissions are concrete and the sensitivity of implications to emission scenarios is considered. It is clear that the potential for DCM to affect the global ozone budget is profound. It remains to be seen if the emission scenarios considered encompass what reality might deliver.

“The study specifically identifies dichloromethane (DCM), the simplest and most widely used of these short-lived molecules, as a serious potential contributor to ozone destruction. Dichloromethane is used in things like degreasers and paint strippers – it is a common and cheap solvent. This study reports that direct measurements of its concentration in the Northern and Southern hemispheres show its concentration to be rising very steeply and for growing quantities to be leaking into the stratosphere.

“The threat from this molecule is manifold. If dichloromethane reaches the stratosphere, it is exceptionally effective in destroying the ozone. At the same time, in the lower atmosphere, it also presents a threat to how the atmosphere can clean itself, as it reduces the so-called ‘oxidising capacity’ which governs the abundance of

pollutants, notably greenhouse gases like methane and the HFCs.

“A striking point about the ozone hole has been that in spite of the success of the Montreal protocol, the speed of recovery of the ozone layer has been less than had been anticipated. This paper is important in identifying much more common chemical compounds as serious global threats to our atmosphere, and calculates their potential consequences. The results are significant, across a range of scenarios, since they imply a significant reversal of Montreal-led reductions in total stratospheric chlorine, and the consequent effects on ozone. It also implies that we need to take a closer look at the impact of a much wider range of molecules containing halogens – especially chlorine and bromine – to understand more fully the impact of our activities on our world. It also suggests that protecting the ozone layer presents a much greater industrial and political challenge than previously thought. Because of their much wider range of uses, updating the Montreal Protocol to include solvents like DCM can be expected to be far more arduous and controversial than for CFCs.”

▶ *[‘The increasing threat to stratospheric ozone from dichloromethane’](#) by Ryan Hossaini *et al.* published in *Nature Communications* on Tuesday 27 June 2017

▶ [Science Media Centre](#), 27 June 2017



5. AHRI Publishes First Flammable Refrigerant Report

The Air-Conditioning, Heating and Refrigeration Institute (AHRI) is testing flammable refrigerants identified as possible replacements for high-GWP HFCs being phased down under the Montreal Protocol.

In a bid to identify suitable replacements for high-GWP HFCs being phased down under the Montreal Protocol, industry association the Air-Conditioning, Heating and Refrigeration Institute (AHRI) on 13 June issued an A2L research report as part of its ongoing testing of flammable refrigerants.

The research and testing program is part of a US\$ 5.2 million commitment on the part of AHRI, ASHRAE, U.S. Department of Energy, and the California Air Resources Board to further test in real-world settings low-GWP, but mildly flammable or flammable, refrigerants.

"The ongoing global effort to phase down the use of high-GWP potential refrigerants requires this vital research, which will help us update relevant codes and standards so that appropriate, climate-friendly alternatives can be safely used in air conditioning and refrigeration equipment," said Karim Amrane, AHRI's Senior Vice-President, Regulatory & Research.

The report – [‘Benchmarking Risk by Whole Room Scale Leaks and Ignitions Testing of A2L Refrigerants’](#) – was developed following testing at UL, which began in June 2016. The objective was to conduct refrigerant leak and ignition testing under real-world conditions to develop data and insight into the risk associated with the use of A2L refrigerants, which are mildly-flammable, but have a low-GWP.

Room-scale tests were performed for commercial and residential scenarios, including a packaged terminal air conditioner in a motel room, a rooftop unit in a commercial kitchen, a walk-in cooler, a reach-in refrigerator in a convenience store, a split HVAC unit in a utility closet and with servicing error, and a split HVAC unit with hermetic electrical pass-through terminal failure.

“The testing was designed to create relatively low-probability events to evaluate if the ignition spread or had the potential to spread if ignition took place,” said Amrane. “This means that more refrigerant was leaked into the space during these tests than what is proposed by the standard. In other words, a worst-case scenario.”

Further tests are planned, the results of which will be released when they are available.

▶ [Hydrocarbon21](#), 15 June 2017, By Andrew Williams

6. The Ozone Awards 2017: Call for Nominations



In celebration of the 30th anniversary of the adoption of the Montreal Protocol, the Ozone Secretariat, in cooperation with the Government of Canada, will host the Ozone Awards at the Twenty-Ninth Meeting of the Parties, to be held in Montreal, Canada, from 20 to 24 November 2017.

The Ozone Awards will recognize the achievements of individuals, groups, and organizations that have demonstrated extraordinary commitment and contribution to the progress and achievements of the Montreal Protocol in the past 10 years. These individuals, groups and organizations also exemplify the power of

cooperation on large and small scales to accomplish goals and produce tangible change.

The Ozone Secretariat is calling for nominations for the Ozone Awards from individuals, governments and implementing partners including the United Nations and international bodies, non-governmental organizations and industry and their associations.

[Download the Call for Nominations](#)

HOW TO NOMINATE

Who is eligible?

You may nominate individuals, groups, civil society organizations, government agencies at local or national level, non-governmental organizations or private sector entities for these awards. You may nominate yourself or the institution to which you belong.

Please note that the Ozone Secretariat, the Secretariat of the Multilateral Fund for the Implementation of the Montreal Protocol, and the individuals working in the two Secretariats are not eligible to be nominated and shall not be part of the selection process.

How do I submit a nomination?

Complete and submit the [online nomination form](#). If you wish, you may submit additional supporting materials such as documents, photos, videos and character references together with the nomination.

Tell us how the nominee has made significant contributions that are required for being considered to win the relevant award.

When are nominations due?

All nomination forms and supporting materials must be submitted by **20 July 2017**.

SELECTION PROCESS

The winners for each award category will be selected through a two-step review:

1. A Technical Screening Committee made up of experts from non-governmental organizations, governments and other stakeholders that are knowledgeable about the ozone layer protection regime and processes will review all nominations and make their recommendations. The Committee may fact-check the details of the nominations with relevant UN bodies. The names of the Committee Members will be published in due course.
2. An International Jury made up of eminent experts will review the Technical Screening Committee's recommendations of nominees and decide on a final list of award recipients in each of the award categories. The names of the Jury Members will also be communicated in due course.

Please note that Members of the Technical Screening Committee and International Jury are also eligible for awards and will recuse themselves from their roles when appropriate.

Award recipients will be announced and awarded during the award ceremony to be held on 23 November 2017 during the Twenty-Ninth Meeting of the Parties, to be held in Montreal, Canada.

KEY DATES

8 May – 20 July 2017	Nomination period: All nomination forms are to be submitted by 20 July.
21 July – 16 October 2017	Review and selection of award recipients.
23 November 2017	Ozone Awards ceremony at the Twenty-Ninth Meeting of the Parties in Montreal, Canada.

- ▶ For further inquiry about the Ozone Awards, please contact:

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[▶ Learn more](#) Ozone Secretariat, [2017 Award](#)



ASIA PACIFIC



7. Ozone Protection and Synthetic Greenhouse Gas Management Legislation Amendment Bill 2017

[This Bill] amends the Ozone Protection and Synthetic Greenhouse Gas (Import Levy) Act 1995, Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 and Ozone Protection and Synthetic Greenhouse Gas (Manufacture Levy) Act 1995 to: implement Australia's commitment to phase-down import, export and production of hydrofluorocarbons from 1 January 2018, in advance of the global phase-down implemented under the Montreal Protocol, as amended by the Kigali Amendment; amend provisions in relation to the hydrochlorofluorocarbon (HCFC) phase-out and prohibit the use of new HCFCs from 1 January 2020 other than for permitted uses; implement Australia's obligations under the Kyoto Protocol to regulate two newly listed synthetic greenhouse gases; amend provisions in relation to equipment bans and ensure that the provisions apply consistently to all entities regulated under the Act; and amend provisions in relation to licensing and reporting requirements.

[▶ Parliament of Australia](#), 23 June 2017



LATIN AMERICA AND CARIBBEAN

8. Dominica Seeking to Control Importation of Ozone Depleting Substances



A one-day workshop aimed at helping countries to limit the importation of substances that destroy the ozone layer, convened in Dominica on Wednesday 28 June 2017.

The Environmental Coordinating Unit of the Ministry of Health and Environment, in conjunction with the United Nations Environment Programmes, hosted the training for fifteen customs and other law enforcement officers at the Fisheries Division's conference room in Roseau.

Participants of the training included custom officers, custom brokers, members from the Marine and Coast Guard, border control and enforcement officers, as well as staff members of the Dominica Air and Sea Port Authority (DASPA).

The workshop was divided into seven sections including Ozone Layer Depletion, International Response, National Obligations and Response, Illegal Trade in Ozone Depleting Substances (ODS) and Equipment and Products containing ODS, Safe handling, Transport and Storage of ODS, Role of the Custom Officers and Other Key Stakeholders, and Customs Quick Tool.

It was noted that the primary objective of the workshop is to improve the skills in the implementation and enforcement of the Montreal Protocol Regulations and to prevent the illegal trade in harmful ODS.

Programme Officer for the UN Environment, Donnalyn Charles, stated that the training is very important for the program to work in Dominica.

“The HPMP or HCFC Phase Out Management Plan is part of Dominica's program of work to assist the country in

phasing out Hydrochlorofluorocarbons (HCFCs),” she stated.

Charles, who added that this training is being implemented globally, informed that similar programs are being implemented in all Caribbean and Latin America countries.

“The program is allowing us ...equip you with the basic tools, information, skill sets and experience needed to assist the Environmental Coordinating Unit (ECU) with implementing its import-export licenses system, so that when ODS or refrigerants come into Dominica, or equipment that use those substances such as refrigerators or AC units, anything that can cool or heat, once they come into Dominica, you are able to identify them,” she stated.

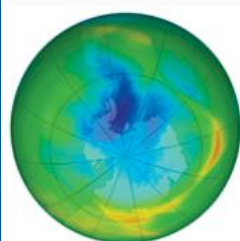
Charles stated that Dominica, as a party to the Montreal Protocol, is mandated to control and phase out the use of those substances.

▶ [Dominica Vibes News](#), 28 June 2017

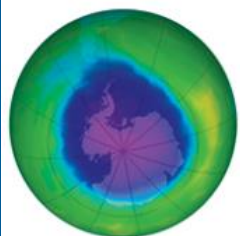


NORTH AMERICA

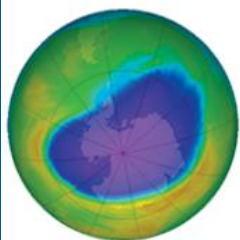
9. Research on Chlorofluorocarbons Designated as Chemical Landmark



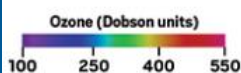
1979



1989



2016



Rowland and Molina’s groundbreaking discovery changed the way humans saw their impact on Earth

Data from NASA shows declining ozone concentrations over time. Since the Montreal protocol went into effect in 1989, ozone levels have stabilized. Credit: Courtesy of NASA’S Ozone hole watch/Aura OMI Science team

With concerns about climate change dominating the news (C&EN, June 5, page 14), it’s fitting that the American Chemical Society awarded one of its most recent [National Historic Chemical Landmark](#) designation to the 1974 discovery by F. Sherwood Rowland and Mario J. Molina of the University of California, Irvine, that chlorofluorocarbons (CFCs) can lead to ozone depletion. Atmospheric ozone helps absorb potentially damaging ultraviolet radiation. Without it, human life cannot survive.

The ceremony and presentation of the plaque took place on April 18 at UCI where, at the time of their discovery, Rowland was a chemistry professor and Molina was his postdoc.

“ACS is deeply committed to communicating the value of science in our everyday lives,” ACS President Allison A. Campbell said in her remarks during the ceremony. “As part of that mission, ACS created the Landmarks program 25 years ago to enhance public appreciation for the contributions of the chemical sciences to modern life and to encourage a sense of pride in its practitioners.”

Until Rowland and Molina’s discovery, CFCs had been widely used as refrigerant gases and as propellants in aerosol sprays. Being chemically inert, they were a welcome alternative to the toxic and flammable compounds previously used in refrigeration and air-conditioning systems, such as ammonia, chloromethane, propane, and sulfur dioxide.

Rowland’s interest in studying CFCs originated with a 1972 talk he attended where the speaker discussed results obtained by British scientist James Lovelock that suggested that practically all the trichlorofluoromethane (CFC-11) ever manufactured was still in the atmosphere. Curious about the fate of CFCs in the atmosphere, Rowland decided to devote part of his research to answering this question.

What Rowland and Molina discovered would change the way humans viewed their impact on Earth. “Chlorofluoromethanes are being added to the environment in steadily increasing amounts. These compounds are chemically inert and may remain in the atmosphere for 40–150 years, and concentrations can be expected to reach 10 to 30 times present levels,” Rowland and Molina wrote in their 1974 paper published in *Nature* (DOI: [10.1038/249810a0](https://doi.org/10.1038/249810a0)). “Photodissociation of the chlorofluoromethanes in the stratosphere produces significant amounts of chlorine atoms, and leads to the destruction of atmospheric ozone.”

Initially, critics dismissed Rowland and Molina’s hypothesis, arguing that few alternatives existed to using CFCs



Campbell (left) and UCI Chancellor Howard Gillman unveil the new plaque. Credit: Steve Chang/UC Irvine

in refrigerators and air conditioners and it didn't make sense to take action against a class of highly useful chemicals on the basis of unproven scientific hypotheses.



Rowland (left) and Molina in their UCI lab in 1974.
Credit: Steve Chang/UCI

Over time, however, the evidence in support of Rowland and Molina's hypothesis grew. For example, in 1985, British scientists who had regularly taken ground-based measurements of total ozone reported in *Nature* that stratospheric ozone had decreased greatly since the 1960s (DOI: [10.1038/315207a0](https://doi.org/10.1038/315207a0)).

Together with Rowland and Molina's trailblazing work, the mounting evidence eventually led to the phasing out of CFCs worldwide through the 1987 Montreal protocol, in which 46 countries agreed to cut CFC production and use in half.

In 1995, Rowland, Molina, and Paul J. Crutzen of the Max Planck Institute for Chemistry, who is another pioneer in stratospheric ozone research, were awarded the Nobel Prize in Chemistry. Rowland died in 2012. [...]

- ▶ [Read more](#) about the chemical landmarks program, including previously designated landmarks.
- ▶ [Chemical & Engineering News](#), Volume 95 Issue 24 | p. 35, 12 June 2017, By: Linda Wang



10. Garden Grove Businessman Suspected of Importing Ozone-Depleting Chemical

A Garden Grove [Orange County, California, USA] man was arraigned Monday, June 19, on an indictment that charges him with illegally importing a highly regulated, ozone-depleting chemical under false pretenses, authorities said.

Mahmoud Alkabbani, 63, imported R-22, a refrigerant gas and class II ozone-depleting substance in cylinders bearing a counterfeit "Glacier" trademark, according to a statement from the United States Attorney's Office for the Central District of California.

According to the indictment, Alkabbani entered into an agreement with a Chinese company to purchase R-22. The 2013 contract with the Chinese company listed the product as R-134a, which is not regulated by the Clean Air Act and does not deplete the ozone layer. A second, secret agreement called for the company to sell R-22 to Alkabbani.

R-22, R22Chlorodifluoromethane, is being phased out around the world, the statement said, and only parties with "consumption allowances" can import it. The statement did not say how much of the chemical Alkabbani is believed to have imported.

Alkabbani, owner of USA Car Parts in Garden Grove, was arrested Friday, June 16, at LAX after he returned from a trip abroad. He pleaded not guilty to the nine-count indictment and was ordered released on a \$30,000 bond. His trial date is set for Aug. 8.

The indictment charges Alkabbani with conspiracy, one count of entry of goods by means of false statement, five counts of passing false and fraudulent papers through a customhouse, one count of smuggling and one count of violating the Clean Air Act by improperly selling R-22 to an undercover agent.

If convicted, Alkabbani would face a maximum sentence of 132 years in federal prison.

- ▶ [Orange County Register](#), 19 June 2017, By: Anthony Mendoza

11 The Sacramento Municipal Utility District Launches Natural Refrigerant Incentive Program

The Sacramento Municipal Utility District (SMUD) has announced the launch of a new pilot program that will provide incentives for direct greenhouse gas (GHG) emission reduction. The program will provide incentives for both energy savings and GHG emissions reduction.

The program is open to SMUD's commercial customers that install new natural refrigerant system or retrofit a system from a high-GWP refrigerant to a natural refrigerant. New systems can include distributed systems, transcritical and cascade, stand-alone systems or self-contained units.

Incentive levels for GHG emissions reduction are calculated separately from energy savings. Energy savings are paid under [SMUD's Custom Incentive program](#) for both kW and kWh reduced. GHG emissions reductions are paid per metric ton of CO₂-equivalent emissions reduction.

A bonus incentive is available for projects implemented by small businesses located in disadvantage communities. The bonus equates to 25% of the GHG emission reduction incentive.

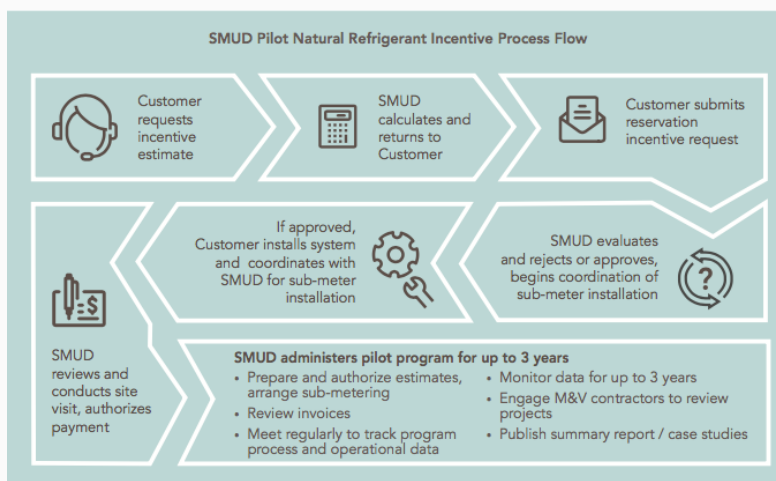
The total combined incentive is capped at \$250,000 or 50% of the project cost, whichever is less.

The GHG emission reduction calculation is based on the refrigerant GWP, charge size and annual leak rate. For retrofits, GHG reduction is calculated based on the difference between the existing and forecasted performance of the system. New systems will use a pre-defined baseline that assumes a default refrigerant, charge and leak rate. The following equation will be applied:

$$\text{Direct GHG Reduction (tCO}_2\text{e)} = \text{Expected or Remaining Life} \times \left[\left(\text{GWP}_{\text{Baseline}} \times \text{Charge}_{\text{Baseline}} \times \text{Leak Rate}_{\text{Baseline}} \right) - \left(\text{GWP}_{\text{New}} \times \text{Charge}_{\text{New}} \times \text{Leak Rate}_{\text{New}} \right) \right]$$

Participants must also agree to allow SMUD access to collect energy consumption data for a minimum of a three-year period. Sub-metering equipment will be installed on refrigeration and electrical systems to monitor energy use.

According to SMUD, in addition to the energy savings and GHG emissions reduction, one of the primary purposes of the pilot is to conduct research that will contribute to the growing body of literature that supports refrigerant policy and practice.



Learn more:

- [SMUD NRIP Fact sheet](#)
- [SMUD NRIP Program Summary](#)
- [SMUD NRIP Supplemental Application](#)

SMUD's Natural Refrigerant Incentive Program process

- ▶ [North American Sustainable Refrigeration Council \(NASRC\), 12 June 2017](#)

12. Strawberry Production in Post-Methyl Bromide World

Parting is such sweet sorrow. Said no conventional strawberry farmer in California, ever.

In 2016, the powerful soil fumigant methyl bromide—a chemical strawberry farmers relied on for decades—was finally phased out in California. In her latest report in *California Agriculture*, Julie Guthman, a 2017 Guggenheim Fellow and a professor of social sciences at UC Santa Cruz, explores how strawberry growers adapted berry production without it.

Because of methyl bromide's negative impact on the ozone layer, the Montreal Protocol mandated a global phase-out of methyl bromide as part of its 1987 pact to reduce ozone-depleting substances. But because it was the most effective chemical to control soil-borne pathogens and weeds, California farmers long continued its use thanks to what is known as a "critical use exemption."



Julie Guthman. Photo by Carolyn Lagattuta.

Without methyl bromide, it was feared that consumer costs would escalate to cover higher production costs of its substitutes. Some worried that strawberry production would move out of California and into Mexico, where the phase out period was longer than in the US.

But by the end of 2016, Guthman found that these pessimistic predictions did not materialize. Instead, production remained relatively steady and the price of berries actually dropped. Guthman also discovered that without methyl bromide, fumigant use still remained strong.

Many farmers used chloropicrin, a chemical once used in combination with methyl bromide. Chloropicrin is a toxic air contaminant that now requires buffer zones between applications to protect nearby buildings and people from exposure. Some farmers moved production to rural areas that do not require a buffer zone.

In some cases, farmers transitioned to organic farming. But it was market opportunities—not fumigation restrictions—that inspired the switch.

Even then, organic farming still requires disease and pesticide-free land or the capital it takes to last the three years to get land previously used for conventional production certified organic. A select few skirted this by purchasing property that was already certified organic or began production in rural areas that had never been farmed (such as a pasture).



Photo by Michael Dales.

Problematically, the cost of organic and conventional farm land has risen as well. Strawberry growers have reported bidding wars over land suitable for berry production (on average, strawberry fields in California can produce 66,500 pounds per acre, the highest yield for the crop in the country).

If a reduction in fumigant use is a goal, Guthman argues that policy-makers must address land access and the financial burden associated with switching to alternatives. Most substitutes to fumigation (including those in the experimental stage) are not only costlier, they require more land for crop rotations.

In sum, insufficient access to land and capital can be a roadblock for any farmer wishing to transition away from fumigant use.

"To the extent that lands costs, availability and lease restrictions impede fumigant reductions, policymakers need to consider strategies that will mitigate the financial risks for growers wishing to attempt nonchemical alternative or transition conventional land to organic production" writes Guthman.

▶ [Read the full report on the California Agriculture website](#)

▶ [UCFoodObserver](#), 27 June 2017



EUROPE & CENTRAL ASIA

13. 220,000 Technicians to Receive Low-GWP Refrigerant Training

REAL Alternatives, an online training programme, will be holding new 'train the trainer' events and study days across Europe thanks to new funding from the European Commission.



Technicians receiving training at Bitzer's SCHAUFLEER Academy

[REAL Alternatives](#), originally an online training programme on low-GWP refrigerants, will now be holding 'train the trainer' events and study days along with other training across Europe.

The expansion of this project means that REAL Alternatives can potentially be delivered to nearly 220,000 technicians across Europe by a network of nationally accredited trainers by the end of the three-year project.

The newly received funding under the LIFE Programme – the European Commission's funding instrument for environment and climate action – is set to promote best practice among technicians regarding low-GWP alternatives including natural refrigerants carbon dioxide, hydrocarbons and ammonia.

The REAL Alternatives project has already shown installers how to use these refrigerants safely, efficiently, reliably and cost-effectively. Programmes like this have increased industry confidence that natural refrigerants training will no longer represent a barrier to uptake.

shecco's recently published [GUIDE to Natural Refrigerants Training in Europe 2017](#) asked industry experts about their expectations for future supply and demand.

A majority of the 150 natural refrigerant training providers surveyed expressed great optimism related to the expected growth in the number of people trained on natural refrigerants per year. Four in five of HVAC&R industry experts expect to see this number increase in the next one to two years. Only one tenth of natural refrigerant training providers said that the numbers would remain the same, with just 5% of respondents saying that it would decrease slightly.

Moreover, more than 65 training receivers shared their expectations about future training. The majority showed great optimism regarding future developments, with over 70% saying they expected more people from their organisations to take up training on natural refrigerants in the next 1-2 years. Slightly less than one fourth of respondents noted that the number of trained people would remain the same.

More REAL Alternatives initiatives

The new funding from the EU REAL Alternative's project looks set to increase confidence that training is a non-issue.

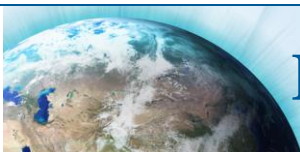
It will update existing content, develop new materials on applying safety standards, and introduce a range of practical exercises and assessments.

A high-profile awareness campaign will be launched soon to get people interested in the programme and increase confidence in the application of low-GWP refrigerants.

Institutes, training organisations and trade bodies across thirteen countries are also involved in the project.

For the three years, thirteen working languages and fifteen partner organisations based in the UK, France, Germany, Italy, Belgium, Poland, Czech Republic, Slovakia, Spain, Romania, Denmark, Portugal, and Turkey will work on increasing awareness, experience and knowledge levels in the refrigeration industry.

▶ [Hydrocarbon21](#), 26 June 2017, By: Charlotte McLaughlin, Anti Gkizelis



FEATURED

OZONE SECRETARIAT

- ▶ Vienna Convention and Montreal Protocol Meetings: A Primer - [Read/Download](#)
- ▶ - [Twenty-Eighth Meeting of the Parties.](#)

- ▶ [- Resumed 38th meeting of the Open-ended Working Group.](#)
- ▶ [- 57th meeting of the Implementation Committee.](#)
- ▶ 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 will be preceded by the 58th meeting of the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, to be held on 9 July and a workshop on safety standards relevant to the use of low-GWP alternatives to HFCs, to be held on 10 July 2017.

Click [here](#) for further information.

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

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

Caring for All Life Under the Sun

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

PROGRESS & QUADRENNIAL ASSESSMENT REPORTS

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

[Assessment Panels List of Meetings](#)

SYNTHESIS REPORTS

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

THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL



[▶ Learn more](#)

[79th meeting of the Executive Committee, Bangkok, 3-7 July 2017](#)

[Report of the 78th meeting of the Executive Committee](#)

[Adjusted business plan of the Multilateral Fund for 2017-2019 after the 77th meeting of the Executive Committee](#)

OZONACTION


UN Environment, [OzonAction](#) highlights

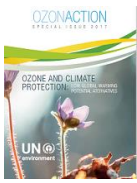
[The Kigali Amendment to the Montreal Protocol - Opportunities and Next Steps - OzonAction Video](#)

The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached agreement at their 28th Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs). The UN Environment, OzonAction developed a video to find out from renowned international scientific, health, technical, financial and national experts about background and significance of this Kigali amendment.

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



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



Ozone and Climate Protection: Low-Global Warming Potential Alternatives - OzonAction Special Issue 2017

OzonAction Factsheets:



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



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



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



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



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

Get the new **RAC Technician Video App**

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

Available in English, French, Spanish, and German

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

NEW!

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

- OzonAction has launched an exciting new application which hosts series of short instructional videos on techniques, safety and best practice for refrigeration and air-conditioning technicians. This application, consisting of short instructional videos on techniques, safety and best practice, serves as a complementary training tool for refrigeration and air-conditioning (RAC) sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training. Additional videos will be added regularly.

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

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



(Just search for 'OzonAction' or scan this QR Code)



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



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



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

Regional News Drops



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

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

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

OzonAction Recent Publications:



[Lower-GWP Alternatives in Commercial and Transport Refrigeration: An expanded compilation of propane, CO₂, ammonia and HFO case studies](#) - This booklet presents an expanded compilation of case studies on lower-GWP alternatives in commercial and transport refrigeration and provides an update to the first set of case studies which was published in 2014 by UNEP DTIE OzonAction/CCAC (Low GWP Alternatives in Commercial Refrigeration: Propane, CO₂ and HFO Case Studies).



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



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



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



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



[PHASING-OUT HCFCs IN SMALL AND MEDIUM-SIZED ENTERPRISES](#) - This booklet aims

to assist foam enterprises, especially SMEs, to better understand policies on HCFC phase-out, access to assistance from the Multilateral Fund for the Implementation of the Montreal Protocol and access alternative technologies in different foam applications taking into account challenges in converting to alternative technology. It also discusses some tips on how to identify enterprises that may use HCFCs and verify the HCFCs consumption of enterprises.



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

EVENTS

2017



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



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



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



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



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



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

2018



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



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



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

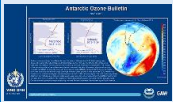
READING



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



[UNEP and USEPA: Promoting ozone and climate-friendly technologies in public procurement - a scoping study of Asia Pacific](#)



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



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



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



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



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



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



[Primer on Hydrofluorocarbons](#), Fast action under the Montreal Protocol can limit growth of HFCs, prevent up to 100 billion tonnes of CO₂-eq emissions by 2050, and avoid up to 0.5°C of warming by 2100. IGSD, January 2014, Lead authors: Durwood Zaelke, Nathan Borgford-Parnell, and Danielle Fest Grabiell. Contributing authors: Stephen O. Andersen, Xiaopu Sun, Dennis Clare, Yuzhe Peng Ling, and Alex Milgroom.



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



[Recent Trends in Global Emissions of Hydrochlorofluorocarbons and Hydrofluorocarbons: Reflecting on the 2007 Adjustments to the Montreal Protocol](#). S. A. Montzka *†, M. McFarland ‡, S. O. Andersen §, B. R. Miller †||, D. W. Fahey †, B. D. Hall †, L. Hu †||, C. Siso †||, and J. W. Elkins †† Earth System Research Laboratory, National Oceanic and Atmospheric Administration, Boulder, Colorado 80305, United States ‡ DuPont

Chemicals & Fluoroproducts, Wilmington, Delaware 19805, United States & Institute for Governance & Sustainable Development, Washington, D.C. 20007, United States|| Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80309, United States

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

A first edition, the IIR guide "[CO₂ as a Refrigerant](#)" highlights the application of carbon dioxide in supermarkets, industrial freezers, refrigerated transport, and cold stores as well as ice rinks, chillers, air conditioning systems, data centers and heat pumps. This guide is for design and development engineers needing instruction and inspiration as well as non-technical experts seeking background information on a specific topic. Publication, IIR Technical Guide, 2014.

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

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

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

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

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

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

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

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

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

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



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





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



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



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



Refrigeration: An increasingly strategic issue for data centres - [Cooling data centres: A major economic challenge](#) Today, data centres play a key role in many businesses as information technology is becoming an increasingly strategic factor. Cooling can present a major economic challenge for data centres. If cooling is implemented incorrectly or is inadequate, the amount of energy required to cool a data centre can equal or exceed that used to operate the equipment. Larger data centres can use a staggering amount of energy just to ensure the day-to-day running of electronic equipment. As a result, these data centres can produce a great deal of heat, which require large-scale cooling systems in order to maintain efficient and continual operation... Browse through a selection of [articles and papers](#), by [iifir](#)



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



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



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



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



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



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



MISCELLANEOUS

Announcement!

The UN Environment, OzonAction, in collaboration with Marco Gonzalez and Stephen O. Andersen are updating and expanding the Montreal Protocol Who's Who" as part of the celebration of the 30th Anniversary of the Montreal Protocol - which was agreed as 16 September 1987.



The new website will be launched during the upcoming Meeting of the Parties to the Montreal Protocol, Montreal, Canada, 20-24 November 2017.

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

Please notify and nominate worthy candidates through the [on-line form](#)

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

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

▶ Contact : [Samira Korban-de Gobert](#), UN Environnement, OzonAction

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



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

[Watch on r774's YouTube channel](#)



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



New *International Journal of Refrigeration* service for IIR members - As of January 2017, not only will IIR members continue to receive the hard copy of the journal but IIR membership will now also give members access to the complete archives of the *International Journal of Refrigeration (IJR)* online. Designed with IIR members in mind, this new and practical electronic subscription gives members substantial advantages:

- Immediate and permanent access to the latest research and to IJR archive
- Access the latest articles as soon as they become available online.
- Browse, search and read each one of the nearly 4,500 papers since Volume 1, Issue 1.
- 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



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



[ASHRAE-coordinated Research on Alternative Refrigerants](#) US EPA GreenChill webinar on Tuesday, July 18, from 2:00pm to 3:00pm. The co-chairs of the research subcommittee of the ASHRAE Multidisciplinary Task Group (MTG) on Low-GWP Refrigerants, Ken Schultz from Trane and Brian Fricke from Oak Ridge National Laboratory, will give a presentation on the status of ASHRAE-coordinated research on environmentally preferable refrigerants.

To join the webinar: 1. Go to <http://epawebconferencing.acms.com/ashrae/> 2. Select "Enter as a Guest". *It is important that you select the option to enter as a guest.* 3. Enter your name. 4. Click "Enter Room". 5. Click "OK".

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



The Montreal Protocol Who's who

See the latest nominations /

Nominate Ozone Layer Protection Champion

From Your Country /Region >>

<http://www.unep.fr/ozonaction/montrealprotocolwhoswho>

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