

# OZONENEWS

**30 July 2015**

**Vol. XV**

**A special OEWG 36 issue**

## **In this issue**

- 1. Montreal Protocol Parties Move Closer to Managing Hydrofluorocarbons under Most-Successful Environmental Treaty**
- 2. Summary of the 36<sup>th</sup> Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol, 20-24 July 2015, UNESCO headquarters, Paris, France**
- 3. The Montreal Protocol and Human Health, How Global Action Protects Us from the Ravages of Ultraviolet Radiation**
- 4. Safe Use of Alternatives to HCFCs, Addressing Flammable, Higher Toxicity and High Pressure Alternatives in the Refrigeration Air-conditioning Sector**
- 5. AHRI and UNEP Agree on Global Qualification Program for Refrigerant Supply Chain Networks**
- 6. CHEAA side event: China's endeavor to use low-GWP alternative in RAC**
- 7. Improving Air Conditioner Efficiency Could Avoid Up To 100 Billion Tonnes of CO<sub>2</sub>**
- 8. Eco Forum Global Annual Conference Guiyang, China 2015 Witnessed the Establishment of New Residency of the Sky-Patching Chinese Goddess NÜWA**



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



# GLOBAL

## 1. Montreal Protocol Parties Move Closer to Managing Hydrofluorocarbons under Most-Successful Environmental Treaty



HFCs are used in the air conditioning, refrigeration, foam and aerosol sectors as replacements for many ozone-depleting substances (ODSs)

Paris, 27 July 2015 - Parties to the Montreal Protocol, the world's most-successful environmental treaty, moved closer to finalizing a mandate for a contact group on the feasibility and ways of managing hydrofluorocarbons (HFCs) under the treaty during their thirty-sixth Open-ended Working Group meeting (OEWG 36) held from 20 to 24 July in Paris, France.

HFCs are man-made fluorinated chemicals that do not deplete the ozone layer but are potent greenhouse gases listed under the UNFCCC/Kyoto Protocol and many of them have high global-warming-potential.

HFCs are used in the air conditioning, refrigeration, foam and aerosol sectors as replacements for many ozone-depleting substances (ODSs), including chlorofluorocarbons (CFCs), halons and hydrochlorofluorocarbons (HCFCs), which are being phased out under the Montreal Protocol.

### Amendment proposals

For the first time ever, the parties, who have considered possibilities of HFC management under the Montreal Protocol over the past seven years, held detailed discussions on various elements of four proposals submitted by a total of 40 countries to amend the Protocol to phase down HFCs.

The parties also discussed issues related to essential-use exemptions for controlled substances and forwarded a draft decision on China's nomination for essential-use exemption for 2016 for carbon tetrachloride for the testing of oil, grease and total petroleum hydrocarbons in water for consideration in November. China's request was the only one received this year.

"This year, there were no requests for essential-use exemption for CFCs for metered-dose inhalers, which represents another milestone in phasing out CFCs," said Tina Birmpili, the Executive Secretary of the Ozone Secretariat.

### Assessment panels' findings

The three assessment panels of the Montreal Protocol presented the main findings of their 2014 quadrennial assessment reports.

The Scientific Assessment Panel highlighted that ODSs are declining in the atmosphere and radiative forcing by CFCs and HCFCs will decline over the course of the 21st century. On the other hand, HFCs are increasing rapidly and radiative forcing by future HFC emissions can be up to 25 per cent of that of future carbon dioxide emissions by the middle of the century, but this could be curbed through the use of HFCs with low global-warming-potential or other alternatives.

The Environmental Effects Assessment Panel observed that because large increases in ultraviolet radiation have been prevented, major effects of ozone depletion on human health have been avoided.

The Technology and Economic Assessment Panel and its six Technical Options Committees noted that the Montreal Protocol is working and its controls have created incentives for new technology.

The panel further observed that HCFC phase-out is progressing, HCFC phase-out management plans are generally running smoothly, both ozone- and climate-friendly options continue to emerge, and continued

vigilance is needed on remaining sector challenges and technology choices, to avoid off-setting the benefits achieved under the Montreal Protocol, particularly for climate.

The three panels will produce a synthesis report of the three 2014 assessments later in the year, to be available for consideration as parties develop their proposals on potential areas of focus for the next quadrennial assessment, to be completed in 2018.

► [UNEP Ozone Secretariat](#) , 27 July 2015

## 2. Summary of the 36<sup>th</sup> Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol, 20-24 July 2015, UNESCO headquarters, Paris, France

The thirty-sixth meeting of the Open-Ended Working Group (OEWG 36) of the parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (MP) convened in Paris, France, from 20-24 July 2015. Over 440 delegates representing governments, UN agencies, MP expert panels and committees, non-governmental organizations and industry attended. At OEWG 36, delegates considered a number of issues, including, inter alia: the 2014 quadrennial assessment reports of the



Scientific Assessment Panel (SAP), the Environmental Effects Assessment Panel (EEAP) and the Technology and Economic Assessment Panel (TEAP); the 2015 progress report of the TEAP; the nominations for essential-use exemptions (EUEs) and critical-use exemptions (CUEs); alternatives to ozone depleting substances (ODS); and the outcomes of the intersessional informal discussions on the feasibility and ways of managing hydrofluorocarbons (HFCs). OEWG 36 also considered four proposals to amend the Protocol to address HFCs: the first by the US, Canada and Mexico; the second by India; the third by the European Union (EU) and its 28 Member States; and the fourth by the Island States—Kiribati, Marshall Islands, Mauritius, Federated States of Micronesia (FSM), Palau, the Philippines, Samoa and Solomon Islands. As the week started, delegates moved swiftly through the agenda items so that the bulk of the time would be available to discuss the proposed amendments. Although clear divisions remained, and despite negotiations in the informal group on the feasibility and ways of managing HFCs running late into the evening on Thursday and Friday without reaching agreement, delegates were still able to hold substantive discussions on the amendment proposals in order to clarify aspects of each proposal. Delegates did agree to hold an additional session of OEWG 36 prior to MOP 27, in order to conclude discussions in the informal group.

### A BRIEF ANALYSIS OF OEWG 36 LE TOUR D'OZONE

Life is like riding a bicycle—in order to keep your balance, you must keep moving. – Albert Einstein

**SOLID START – FIRST OUT THE GATE** OEWG delegates convened in Paris, the city awaiting the arrival of the most famous bicycle race in the world, the Tour de France, at a milestone in ozone history. 2015 marks the 30<sup>th</sup> anniversary of the Vienna Convention for the Protection of the Ozone Layer—one round of “le tour d’ozone,” so to speak. With 197 parties who have ratified the Vienna Convention, its Montreal Protocol and subsequent amendments, amounting to universal ratification makes it the most broadly ratified and implemented multilateral environmental agreement. The Montreal Protocol has successfully reduced ozone depleting substances, starting with CFCs and halons, then carbon tetrachloride and methyl bromide, followed by HCFCs, the phase-out of which is still underway. This year marked further milestones, as no essential-use exemptions for metered dose inhalers were received and the number of critical-use exemptions declined.

At this OEWG session, the Scientific Assessment Panel underscored that the Montreal Protocol has gone the long, steady distance since its start: ODS are declining and the ozone layer is continuing to heal; but challenges remain such as a rapid increase in HFCs that have been used as a replacement substance, some of which have a

high global warming potential. These are words that ring loudly in Paris, a city gearing up for the upcoming crucial climate change conference starting on 30 November 2015. The building momentum and pressure could also be felt at this meeting, with many eyes on the Montreal Protocol's next time trial addressing HFCs, whose finish could contribute to addressing the climate change challenge.

OEWG 36 spent much of its time focusing on moving the discussion on HFCs management forward. It was the first time substantive, rather than just procedural, discussions on aspects of the amendments had been held in a formal setting. There were also informal discussions to try and establish terms of reference for a contact group to continue this discussion. Both of these discussions hoped to build on the sound footing of the Protocol, buoyed by its previous successes. This brief analysis looks at the discussions on the HFC amendments in the context of the history of the ozone regime, and assesses whether its history of success will ultimately help the current peloton of delegates move the Montreal Protocol into its next stage.

**THE CHALLENGE OF CHANGING TIMES IN A MULTISTAGE RACE** The Vienna Convention itself has weathered changing times. In the first half of its life, it saw the negotiation of the Montreal Protocol followed by four amendments, including the pivotal London (1990) and Copenhagen (1992) amendments and adjustments focusing on CFCs and HCFCs respectively—the early stages of the multi-stage “tour d’ozone.” A future HFC amendment could be compared to those in order of magnitude. All previous amendments were negotiated over a relatively brief period of time by many of the same negotiators who brought the Protocol into being. Compelling scientific evidence, such as the 1988 Ozone Trends Panel Report, surely played an important role in propelling parties into action, even when some replacement technologies were not yet available.

Similarly the Intergovernmental Panel on Climate Change (IPCC)/TEAP special report on safeguarding the ozone layer and global climate system, which was part of the Fourth Assessment Report of IPCC that won the 2007 Nobel Peace Prize, was the first to spark broader awareness about the chemical and radiative effects of HFCs. The report pointed to the complex two-way interactions between stratospheric ozone and climate and also sparked concern about HFCs, which by then had been deployed as a replacement substance for HCFCs under the Montreal Protocol. Arguably the Protocol is not only in the best position to deal with a phase-down of HFCs with high GWP, but also has a responsibility to be actively involved in this process since it played a role in increasing the use of HFCs in the first place.

The question that remains is how to move to the next stage, namely addressing HFCs.

With the last amendment having been negotiated over 15 years ago, many delegations have not retained the institutional memory of negotiating amendments that could help guide parties through this difficult terrain. But as some delegates pointed out what parties have now is an institutional memory and experience of implementation. Notably, countries have the experience of what worked and what was missing from previous amendments and their implementation, most notably with issues of financing, technology transfer and IPRs.

Another concern that came to the fore was how a number of Article 5 countries felt rushed in the previous amendment negotiations. A seasoned delegate was heard commenting that due to this perception, a number of parties felt like they may have lost out in the process, suggesting that this included not having Article 5 countries' financial concerns fully addressed. This might underlie some of the anxieties of parties about undergoing another round of Montreal Protocol amendment negotiations and the call to have their concerns addressed first before considering amendment proposals. It might also explain the mistrust by some delegations who questioned certain proponents' assurances that issues critical to other parties, such as full funding for conversions and providing for exemptions where viable alternatives are not yet widely available on the market at a reasonable price, will be adequately dealt with in the upcoming negotiations.

This anxiety and mistrust could be noted in the informal discussions about how to address HFCs, with much time being spent on discussing and listing concerns, which some delegations insisted had to be addressed first before considering amendment proposals. Others, however, said that they did not share these concerns and expressed confidence that any and all issues could be raised within a contact group.

Many delegates pointed to the lead role that the Montreal Protocol can take by addressing HFCs. HFCs are not ODS but rather greenhouse gases, many with high global warming potential. There is growing agreement among delegates that the Montreal Protocol is best positioned to address the increase in HFCs due in large part to its use as a replacement substance. Many delegates noted that no other convention has the infrastructure to address the issue and that the Montreal Protocol is best positioned to address the challenge having sound footing and processes for replacing substances, and providing funding for transition in Article 5 countries through the Multilateral Fund, that have been built and strengthened over the decades and that other conventions simply do not have.

**TAKING ANOTHER TURN** Many viewed it as an achievement that OEWG 36 held a substantive exchange on the amendment proposals to air some of the prevailing concerns and issues. Parties were able to query

proponents and seek clarifications about the proposals and thereby prepare themselves for future negotiations. This was achieved by separating the discussion about the mandate for a contact group, which proceeded in informal consultations and reported regularly to plenary and, on the other hand, having a separate agenda item on the amendment proposals, which were discussed in detail in plenary, component by component, over the better part of three days—something never before done in either the OEWG or the MOP.

Most delegates welcomed that there are now four proposals that have been submitted by about 40 parties. This in itself was seen by many as evidence of a growing momentum in favor of an HFC amendment. Generally, there seems to be a growing consensus that HFCs should be addressed under the Montreal Protocol, with parties acknowledging this in substantive discussions in plenary and getting close to agreement on a process going forward.

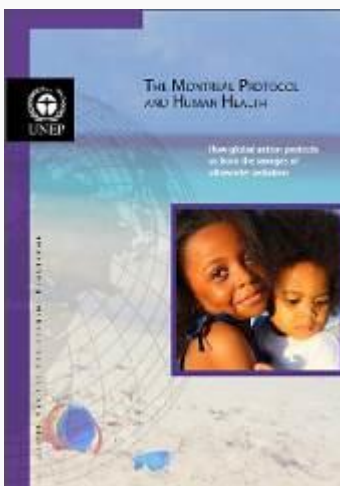
Delegates also recognized that the four HFC amendment proposals currently on the table also differ significantly but, as one delegate noted, there is opportunity in this diversity, with delegates now able to pick and choose components from each so that they can create an amendment that balances parties' different concerns. Among the critical issues that need to be worked out are the baselines and timelines for an HFC phase-down. As some Article 5 countries pointed out, the HCFC phase-out in non-Article 5 countries is almost complete, while they themselves are still in the midst of it. One delegate was heard pointing to the fear of Article 5 countries carrying a double burden as another reason for resistance to quick timelines. Some parties were concerned that overlapping phase-downs of HCFCs and HFCs could place undue pressure on their industries and negatively affect national economic growth.

Building on these first substantive discussions, now might be the moment in time for the Montreal Protocol to reassert its role and responsibility in the interplay between safeguarding the ozone layer and the global climate system. It will remain to be seen if delegates can use the momentum offered by the concern over climate change to speed up the tour d'ozone and set the agenda for the next 30 years to come.

▶ [Earth Negotiations Bulletin, Vol. 19 No. 109](#), The International Institute for Sustainable Development (IISD) Monday, 27 July 2015

▶ See also: OEWG 36 [daily highlights](#)

### 3. The Montreal Protocol and Human Health, How Global Action Protects Us from the Ravages of Ultraviolet Radiation



The successful implementation of the Montreal Protocol sends out the powerful message that the world can come together to avert a common threat to humanity. Since its adoption in 1987, the treaty to phase out the substances that deplete the stratospheric ozone layer has resulted in significant benefits to human health worldwide. This has been achieved primarily by the prevention of large increases in ultraviolet (UV) radiation in most inhabited parts of the globe.

Ozone depletion increases the UV radiation reaching the Earth's surface. Intensive scientific research over the past years has resulted in a clearer understanding of how ozone depletion affects not only human health but also food production and life supporting ecosystems.

The world would have been a very different place without the Montreal Protocol. Summarising current understanding of how changes in UV radiation affect human health, this booklet also presents a picture of what the world would have been like, had we failed to control ozone depleting substances. There would have been a collapse of stratospheric ozone by the middle of the 21st century, resulting in large increases in UV radiation in all parts of the world, from the poles to the tropics.

The effects of the outstanding implementation of the Montreal Protocol on human health are beginning to be quantified with at least 100 million cases of skin cancer expected to have been avoided by the end of this century. A recent model suggests the prevention of over 300 million skin cancers in the USA alone. Many millions of extra cases of cataracts will have been prevented by 2100, one estimate suggesting tens of millions of cases in the USA alone.

Exposure to UV radiation can also affect the human immune system and, by limiting ozone depletion, the Montreal Protocol is expected to have avoided all measurable impact of UV rays on human immune function. The decrease in UV radiation, as the ozone layer recovers, is also not expected to affect the amount of time people need to spend in the sun in order to synthesise Vitamin D, which is crucial to human health.

Increased UV radiation could affect crop production and damage some economic fish species as well as marine life-supporting ecosystems vital for fisheries. The Montreal Protocol has thus benefited human health by protecting food security. Another benefit is the phase-out of commonly used toxic chemicals, such as methyl bromide. Finally, by eliminating ozone depleting substances that are also powerful greenhouse gases, the Protocol has helped reduce health risks related to climate change.

The scale of the damage to health had we failed to protect the ozone layer is clear. The health and well-being of hundreds of millions of people, many yet to be born, have been protected by the concerted action of the Parties since 1987.

...

## Foreword

Human health has always been at the forefront of protecting the ozone layer. In 1985, the very first lines in the preamble of the Vienna Convention for the Protection of the Ozone Layer leave no doubt that the Parties to the Convention were “...aware of the potentially harmful impact on human health and the environment through modification of the ozone layer...”. Two years later, in 1987, this position is re-affirmed in the preamble to the Montreal Protocol which begins “...mindful of their obligation ...to take appropriate measures to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer”.

We now look back at those statements after thirty years during which the Parties to the Vienna Convention and Montreal Protocol have invested immense efforts to protect the ozone layer. The protection of human health has been implicit in every action of the Parties. Yet, perhaps, in our detailed discussions of the use and replacement of ozone depleting substances, the complexity of stratospheric processes and so on, we have sometimes overlooked what protecting the ozone layer really means to the health and well-being of every person living on the planet. It is that “human face” of protecting the ozone layer that this booklet explores.

The booklet summarises current understanding of how changes in the ozone layer affect human health, not only in the world we live in but also in the ‘World Avoided’. That is the world we would have lived in had we failed to control ozone depleting substances. By examining the ‘World Avoided’ we clearly see, to echo the words of the Vienna Convention, the magnitude of the “*harmful impact on human health and the environment*” that we have prevented through the effective implementation of the Montreal Protocol.

The Montreal Protocol is widely heralded as a success story both in terms of achieving its direct aims in ODS phase-out targets and the resultant curbs in ozone depletion, and consequent environmental and health benefits.

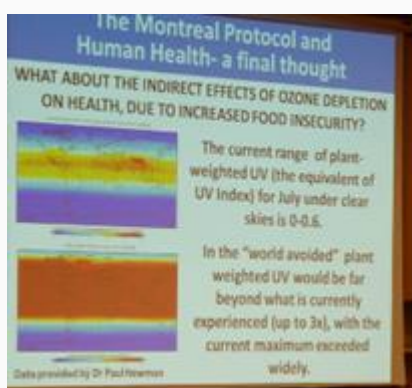
The considerable quantified public health benefits of reductions in UV radiation are of particular significance in demonstrating the success of the Protocol and the contribution to the Millennium Development Goals (MDGs), «ensuring environmental sustainability and combatting diseases».

It is our wish that this publication will serve the National Ozone Units and other stakeholders to raise the visibility, awareness and education of the Montreal Protocol. “*Education is the most powerful weapon which you can use to change the world*” (Nelson Mandela). Let us work together to educate on the protection of our environmental common, the precious ozone layer.

We are grateful to Professor Nigel Paul for taking this highly scientific subject and converting it to an easy read for all stakeholders. We also thank all the reviewers for their voluntary contributions to the publication.

Shamila Nair-Bedouelle

Head of OzonAction



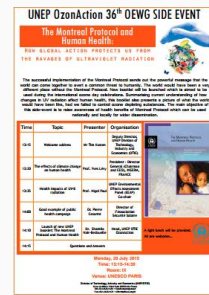


OzonAction launched this new publication during the OEWG 36, on Monday, 20 July. The side-event was well attended, the room was full, and the topic generated a great interest among the delegates.

The participants were welcomed by Mr Tim Kasten, Deputy Director, UNEP Division of Technology, Industry and Economics (DTIE), and had the chance to listen to the views and interact with international experts: Prof. Yves Lévy, President - Director General (Chairman and CEO), INSERM, France; Prof. Nigel Paul, UNEP Environmental Effects Assessment Panel (EEAP) Co-chair; Dr. Pierre Cesarini, Director of l'Association Sécurité Solaire.

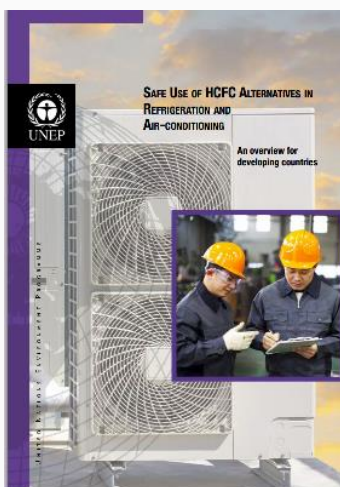
The numerous questions received from the audience during the side-event showed the pertinence of the Montreal Protocol health benefits and the importance of taking appropriate measures to protect human health and the environment.

▶ View/download the [Publication](#) | [Agenda](#) | Presentations:



▶ Click on images to view / download the presentations

#### 4. Safe Use of Alternatives to HCFCs, Addressing Flammable, Higher Toxicity and High Pressure Alternatives in the Refrigeration Air-conditioning Sector



As the phase-out of hydrochlorofluorocarbons (HCFCs) progresses under the Montreal Protocol on Substances that Deplete the Ozone Layer, it is expected that there will be a considerably higher uptake around the world, and in particular in developing countries of 'alternative refrigerants', such as hydrocarbons, ammonia, carbon dioxide, unsaturated hydrofluorocarbons (HFCs) –or HFO- and HFO mixtures.

Many of these alternative refrigerants have particular characteristics in terms of toxicity, flammability and high pressure which are different from those used previously such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). When refrigeration and air-conditioning equipment is installed, serviced, repaired and dismantled, safety issues need to be carefully evaluated and considered particularly when servicing technicians have to deal with refrigerants with properties that they were previously not familiar with. 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 to HCFCs, their general characteristics and the situations in which they may considered appropriate to be used in the context of the safety implications posed by these refrigerants.

Specific information is provided on flammable, higher toxicity and higher pressure alternatives to better understand how such alternatives may be used and the measures which should be considered to assist the industry to implement them in a safe and appropriate manner.

The publication, which is intended for National Ozone Units (NOUs) and other interested parties in developing countries, provides general suggestions and guidance on how NOUs can advise and assist their national stakeholders. The focus of the publication is on new systems, since the use of flammable, higher toxicity and/or higher pressure alternatives is strongly discouraged from being used in existing HCFC systems. Consideration is also given to the relevant requirements and recommendations of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol.

...

**Foreword**

On the 1<sup>st</sup> January 2015 developing countries reached the second significant milestone in the phase-out of hydrochlorofluorocarbons (HCFCs) under the Montreal Protocol on Substances that Deplete the Ozone Layer – the 10% reduction in their production and consumption. Since many of the low GWP alternatives to HCFCs have properties such as flammability, toxicity, and high operating pressure the adoption of such alternative refrigerants needs to be carefully considered to ensure the safety of those who install, service and use the relevant equipment. This is particularly important when servicing technicians have to deal with refrigerants with properties that they were previously not familiar with. UNEP OzonAction is assisting developing countries to comply with their commitments under the Montreal Protocol, particularly those related to the HCFC phase-out, which involves a range of sectors and approaches. A very important sector in developing countries is of course the refrigeration and air-conditioning sector and it is consequently important that the refrigeration and air-conditioning industry adapts to both the technical and safety issues concerning these refrigerants.



We are therefore pleased to bring you this short publication on the safe use of HCFC alternatives. While this guide is principally designed as an information tool for NOUs, it should also be of interest to refrigeration servicing technicians, refrigeration associations, and other stakeholders in the refrigeration and air-conditioning sector.

I hope you will find this guide interesting and informative and that it provides a useful overview and some practical guidance when considering the adoption of HCFC alternatives.

OzonAction looks forward to continue supporting your efforts to phase out HCFCs and adopting non-ozone depleting, non-global warming and energy-efficient alternatives in a safe and reliable manner.

Shamila Nair-Bedouelle,  
Head of OzonAction

...



This side event provided overview of ‘alternative refrigerants’, such as hydrocarbons, ammonia, carbon dioxide, unsaturated HFCs or HFOs, and discussed the relevant safety issues which are to be considered when servicing technicians have to deal with such refrigerants with properties that they were previously not familiar with.

The participants had the opportunity to interact with the author Daniel Colbourne, Re-phridge Ltd, UK, and international experts: Dr. Roberto de Peixoto, Maua Institute, IMT, Sao Paulo, Brazil, TOC Co-Chair; and Mr. Antoine Azar, Chair "Refrigerants, Naturally!", The Coca-Cola Company; and learned more on some specific examples of where such



alternatives are adopted, as well general suggestions and guidance on how National Ozone Units can advise and assist their national stakeholders.



▶ Click [here](#) to read/download the publication and on images for the presentations

## 5. AHRI and UNEP Agree on Global Qualification Program for Refrigerant Supply Chain Networks



Paris, France - 23<sup>rd</sup> July 2015 - In the margins of the 36<sup>th</sup> meeting of the Open-Ended Working Group (OEWG) of the Montreal Protocol, AHRI and UNEP organized a special event to launch an exciting new initiative. The Montreal Protocol, over the last two decades, has accelerated the global transition to new refrigerants in order to meet the ozone layer protection targets agreed to by the international community. This development entails several challenges mainly with regard to soundly and safely managing refrigerants being deployed in the refrigeration and air-conditioning applications, as well as upgrading the skills and knowledge of field specialists to accommodate new technologies.

AHRI and UNEP agreed to cooperate with global industry to promote the sound deployment of future refrigerants and to support efforts of developing countries in adopting low-GWP alternative refrigerants safely and efficiently. The new joint initiative entitled "Refrigerant Driving License" (RDL) aims at introducing a globally-recognized industry qualification program for the sound management of refrigerants.

"Working with UNEP and developing the RDL is one very important aspect of the industry's focus on ensuring the proper, safe, and environmentally sound management of refrigerants," said AHRI President and CEO, Stephen Yurek. "AHRI's relationship with UNEP will provide an excellent platform for working with other associations and institutes, creating a global network to support the safe handling of refrigerants," he said.

The initiative will complement existing national/regional refrigeration and/or refrigerant certification schemes, and could be adopted by any country or group of countries through the creation of a global platform with minimum requirements acceptable by the HVAC&R Supply-Chain Network for the sound and safe use of refrigerants now and in the future.

Opening the side event, Tim Kasten, Deputy Director, UNEP Division of Technology, Industry and Economics, referred to the important role of UNEP OzonAction in providing the appropriate technical and policy guidance to A5 countries to meet the Montreal Protocol targets while maximizing the climate benefits when selecting alternatives. He also highlighted the importance of partnering with international specialized associations and organizations in delivering services and support to countries and providing up-to-date information and competent assistance. Mr. Kasten concluded “We are here today to launch this joint endeavor aiming at complementing the noble international efforts to protect the ozone layer while minimizing climate impacts. I'm glad to join the AHRI President today in signing this exchange of letters as a starting point for developing and materializing a long-term partnership between AHRI and UNEP.”

Although initiated by AHRI and UNEP, the RDL will be open for broader global involvement from relevant interested industry and engineering associations and organizations.

▶ View/download the [agenda](#) / presentation:



▶ Contact:

[James K. Walters](#), Vice President, International Affairs-Air-Conditioning, Heating, and Refrigeration Institute

[Ayman Eltalouny](#), Programme Officer, OzonAction Compliance Assistance Programme, UNEP Regional Office for West Asia

## 6. CHEAA side event: China's endeavor to use low-GWP alternative in RAC

21 July 2015, CHEAA, UNIDO, UNEP and GIZ, supported by MEP/FECO, organized a side event to introduce the efforts to adopt non-HFCs alternatives in the residential air-conditioner industry during the 36<sup>th</sup> OEWG meeting in Paris. There were around 80 participants from the Parties and NGOs who attended this side event. This side event provided a good opportunity for the China residential air conditioner industry to communicate with other countries.



The vice president of CHEAA, Mrs. Wang Lei, reported that many tests and much research has shown that the energy efficiency of residential air conditioners based on R290 [hydrocarbon] refrigerant is better than other alternatives to HCFC-22. She also reported that R290 is also suitable for various ambient temperature areas, such as high ambient temperature regions. Additionally, she informed that risk assessment studies have also shown that the safety can be controlled by suitable measures.

Currently, the China residential air conditioner industry is actively promoting the use of R290 as an alternative to R22. Eight production lines based on R290 with the capacity of 1.8 million units have been set up in five

companies, including Gree, Midea, Haier, Changhong and Chunlan. Two compressor lines based on R290 have been set up in two companies, including GMCC and Haili.

On 13 March 2015, the 'Environmentally friendly and low-GWP label' was released by MEP/FECO, CHEAA, UNEP, UNIDO and GIZ. The aim of this label is to promote the commercialization of air conditioners based on R290.

Mrs. Wang Lei informed that she considered that the greatest challenge for using R290 will be faced by technicians servicing and installing air conditioners. To remove this barrier to using R290, 19 training centres have been established in China. The training centres will educate the technicians to provide them with the knowledge necessary to operate R290 air conditioners and to adopt good servicing practice.

The deputy chief of FECO, Mr. Zhong Zhifeng, informed that the related standards on installing and servicing are expected to be issued by the Chinese Government this year.

This side event provided a good opportunity for the China residential air conditioner industry to communicate with other countries.

▶ Contact

[Dou Yanwei](#), China Household Electrical Appliances Association (CHEAA), Beijing, China

[Shaofeng Hu](#), Regional Network Coordinator for Southeast Asia, OzonAction Compliance Assistance Programme, UNEP Regional Office for Asia and the Pacific

## 7. Improving Air Conditioner Efficiency Could Avoid Up To 100 Billion Tonnes of CO<sub>2</sub>



*Parallel phase down of HFC refrigerants more than doubles total mitigation Dual strategy critical for avoiding 2°C barrier*

Paris, France, 20 July 2015 – Improving the energy efficiency of room air conditioners to the level of efficient units already on the market can provide climate mitigation up to 100 billion tonnes of CO<sub>2</sub> by 2050, a substantial part of the mitigation needed to keep the planet from warming more than 2°C above pre-Industrial levels, pegged by many scientists and policy makers as the upper temperature limit for preventing potentially irreversible and catastrophic impacts, including punishing heat waves, prolonged droughts, massive floods, more frequent super-storms, and destructive sea-level rise.

Improving efficiency of air conditioners could avoid an estimated ~25 billion tonnes of CO<sub>2</sub> emissions in 2030, ~32.5 billion tonnes in 2040, and ~40 billion tonnes in 2050, for a cumulative savings up to 97.5 billion tonnes of CO<sub>2</sub>, according to researchers at the Lawrence Berkeley National Laboratory (LBNL) in California, who note that there are always some uncertainties associated with such projections. The researchers calculate that the savings in peak demand could be equal to 500-1200 gigawatts (GW) of electricity, which would avoid (or free up for other uses), an amount of electricity equal to the production from between 1,000 and 2,500 medium-sized (500 MW) peak-load power plants by 2050.

The final draft report by Nihar Shah, Max Wei, Virginie Letschert, and Amol Phadke will be released for tomorrow as *Benefits of Leapfrogging to Super-efficiency and Low Global Warming Potential Refrigerants in Air Conditioning*. (The attached table from the final draft report shows the estimated number of avoided power plants in 2030 and 2050 for select countries, including China, India, Brazil, Egypt, Indonesia, Pakistan, Saudi Arabia, and UAE.)

“Improving energy efficiency of air conditioners can at least double the mitigation from phasing down the refrigerant known as HFCs, as most Parties to the Montreal Protocol are eager to do through an amendment this year,” said Durwood Zaelke, President of the Institute for Governance & Sustainable Development. “The proposed HFC amendment would avoid the equivalent of another 100 billion tonnes of CO<sub>2</sub> by 2050, and perhaps much more, and would avoid more than 0.5°C of warming by end of century.”

“Leapfrogging over HFCs into climate-friendly alternatives during the ongoing phaseout of HCFCs under the Montreal Protocol would add an additional 39 to 64 billion tonnes of CO<sub>2</sub> equivalent; this could bring the total mitigation up to 250 to 300 billion tonnes CO<sub>2</sub>-equivalent by 2050 from a dual strategy to phase down HFCs while improving air conditioning efficiency,” Zaelke added.

“Past phase outs of refrigerants under the Montreal Protocol have catalyzed improvements in appliance energy efficiency on the order of 30 to 60%,” Zaelke said. “Parallel efforts to set efficiency standards and to ban imports of inferior air conditioners could ensure that efficiency was improved even faster.”

“Efficient air conditioners are commercially available today, and can save money for consumers by substantially lowering their operating costs,” said Dr. Nihar Shah, the lead author of the report. “Our calculations take into account that there will be some rebound effect from efficiency improvements, as some users will use their air conditioners more when they are cheaper to operate. Even with this, the climate and cost benefits are substantial.”

The Montreal Protocol, widely recognized as the world’s most effective environmental treaty, has phased out 98% of the production and consumption of CFCs and nearly 100 other chemicals that both destroy stratospheric ozone and warm the climate, successfully putting the stratospheric ozone layer on the path to recovery by mid-century.

Five similar proposals have been submitted by a total of 95 Parties to the Montreal Protocol to amend the treaty to phase down the upstream production and consumption of HFCs (leaving the accounting and reporting of the downstream emissions in the UN climate regime). The 95 Parties include a coalition of island States led by the Federated States of Micronesia and the Philippines, the Africa Group of 55 Parties, the U.S., Canada and Mexico, the EU-28, and India.

Many additional Parties support the HFC phase down, including China, where President Xi reached an agreement with U.S. President Obama to phase down the HFCs under the Montreal Protocol. LBNL calculates that improving air conditioner efficiency in China could reduce peak demand by between 130-300 GW by 2030 and between 150 and 360 GW by 2050, avoiding (or freeing up for other uses) electricity generation capacity of up to 620 medium-sized power plants by 2030, and up to 720 by 2050.

India’s Prime Minister Modi and President Obama also agreed to support the phase down through the Montreal Protocol. LBNL calculates that India can reduce peak demand by between 28 and 66 GW by 2030 and between 110 and 250 GW by 2050, avoiding (or freeing up for other uses) electricity generation capacity of up to 130 medium-sized peak-load power plants by 2030, and up to 510 medium sized peak-load power plants by 2050.

President Rousseff of Brazil also signaled Brazil’s support in a joint statement with President Obama last month. LBNL calculates that Brazil can reduce peak demand by between 15 and 36 GW by 2030 and between 46 and 108 GW by 2050, avoiding (or freeing up for other uses) electricity generation capacity of up to 72 medium-sized peak load power plants by 2030 and up to 216 by 2050.

The final draft LBNL report is being released tomorrow during the Open-Ended Working Group meeting of the Montreal Protocol being held this week in Paris at an event hosted by LBNL, IGSD and Terre Policy Centre. The Meeting of Parties to the Montreal Protocol will be held 1 to 5 November in United Arab Emirates.

While a large majority of countries are pushing for the HFC amendment, Saudi Arabia, Kuwait, and a few other regional allies have been opposing, in part at least out of concern that the climate-friendly substitutes for HFCs should be tested first in countries with high ambient temperatures such as they experience. According to Zaelke, “An exemption for countries with high ambient temperatures is one possible way to address this concern.”

“Success with the HFC amendment will provide momentum for the UN climate negotiations in Paris in December, and will provide a significant down payment on the mitigation needed to keep the climate safe,” Zaelke added.

- The Executive Summary of the Lawrence Berkeley National Lab report is [here](#)
- IGSD’s *Primer on HFCs* is [here](#)

	2030				2050			
	Efficiency improvement <sup>2</sup>	Refrigerant transition	Efficiency Improvement & Refrigerant transition <sup>3</sup>	Number of Avoided 500 MW Peak Power Plants	Efficiency improvement	Refrigerant transition	Efficiency Improvement & Refrigerant transition	Number of Avoided 500 MW Peak Power Plants
Brazil	14-32	2.3-5.4	15.4-36	31-72	41.3-96.4	6.9-16.1	46-108	92-216
Chile	0.44 -1.0	0.1-0.2	0.5-1.1	1-2	0.9- 2.2	0.2-0.4	1.0-2.0	2-4
China	118 -277	20-46	132-310	264-620	138.5-323.2	23.1-54	155-361	310-720
Colombia	1.9-4.3	0.3-0.7	2.1-4.8	4-10	4.7-10.9	0.8-1.8	5.0-12.0	10-24
Egypt	2.6-6.2	0.4-1.0	3.0-7.0	6-14	9.0-21.0	1.5-3.5	10.0-23.0	20-46
India	25.2-58.9	4.20 -9.8	28-66	56-130	98-229	16.4-38.2	110-256	220-510
Indonesia	17.8-41.5	3.0-7.0	20-46	40-92	27-63	4.5-10.5	30-71	60-140
Mexico	1.8-4.2	0.3-0.7	2.0-4.7	4-10	5-11.6	0.8-1.9	5.5-13	11-26
Pakistan	1.2-2.9	0.21-0.48	1.0-3.0	2-6	8.0-19	1-3.0	9.0-21	18-42
Saudi Arabia	1.7-4.0	0.3-0.7	2-4.4	4-9	2.2-5.1	0.4-0.9	2.4-6	5-12
Thailand	5.2-12.2	0.9-2.0	6-13.7	12-28	6-13.8	1-2.3	6.6-15	14-30
UAE	0.71-1.7	0.1-0.3	0.8-1.9	2-4	1-2.3	0.2-0.4	1.1-3	2-6
Vietnam	5.8-13.4	1-2.2	6.4-15	13-30	6.7-15.7	1.1-2.6	7.5-18	15-36
Global	302-705	50-117	338-788	676-1576	487-1137	81-190	544-1270	1090-2540

**Table 1 Range of Estimated Peak Load Reduction (GW) in 2030 and 2050 from Efficiency Improvement and Refrigerant Transition<sup>1</sup>** (Source: Author's Calculations)

1 Note: These estimates assume a peak load coincidence with AC use of 0.3(30% of time) on the low end to 0.7(70% of time) on the higher end.  
 2 Note: The results for efficiency improvement from Shah et al, 2013 are under ISO 5151 T1 test conditions for both the baseline and efficient air conditioners. While it is well known that performance degrades at higher ambient temperatures, the assumption of 30% efficiency improvement is justified as both the more efficient and less efficient air conditioners will degrade roughly equally in performance at high ambient temperatures, for the same refrigerant.

3 Note: results for the policies enacted together are lower than simple addition of the results for the policies in isolation simply because the results are multiplicative and not additive. i.e. the results from efficiency improvement are multiplied to the results from refrigerant transition. For example an efficiency improvement of 30% along with a 5% improvement in efficiency from refrigerant transition will result in a 33.5% reduction in energy consumption as follows:  $[1-(1-0.3)(1-0.05)]=[1-0.7(0.95)]=1-0.665=0.335$ .

🔗 [Institute for Governance & Sustainable Development](#), July 2015

## 8. Eco Forum Global Annual Conference Guiyang, China 2015 Witnessed the Establishment of New Residency of the Sky-Patching Chinese Goddess NÜWA

The Eco Forum Global Annual Conference, Guiyang 2015, was held in the capital city of Guizhou Province in Southwest China this June. The conference caught the attention of global leaders from government, business, academia, media and civil society. These professionals met at the Guiyang International Eco-Conference Center, which served as the permanent venue for this annual event.

An environmental themed sculpture Sky-Patching Chinese Goddess Nüwa, created by one of the top artists in China Mr. Yuan Xikun, was unveiled to perpetually inaugurate at the Eco-Conference Center plaza by the Eco Forum Guiyang. Zhang Xinsheng, the Secretary-General of the Eco Forum Global Annual Conference Organizational committee, Zhang Shigang, the United Nation Environment Programme (UNEP) Country Coordinator in China, Ligia Noronha, the Director of UNEP's Division of Technology, Industry and Economics, Zhang Zhenshan, the director of the UN-Habitat Representative Office in China, Li Wei, the vice president of China Environmental Protection Foundation, and the artist Yuan Xikun participated in the ceremony celebrating the inauguration of the sculpture. In addition, several diplomats also joined the ceremony, including Gustavo A. Martino, Ambassador of Argentina to China, Juan Carlos Capunay, Ambassador of Peru to China, Jose Maria Borja, Ambassador of Ecuador to China.



🔗 Contact: [Shaofeng Hu](#), Regional Network Coordinator for Southeast Asia, OzonAction Compliance Assistance Programme, UNEP Regional Office for Asia and the Pacific.



# FEATURED

## OZONE SECRETARIAT

- Browse through the Ozone Secretariat “[In Focus](#)” to learn about latest updates.



Logo for the 30<sup>th</sup> anniversary of the Vienna Convention

This year marks the 30<sup>th</sup> anniversary of the Vienna Convention for the Protection of the Ozone Layer, an important milestone in the protection of the ozone layer. The theme for the celebration of the anniversary and this year’s International Day for the Preservation of the Ozone Layer to be marked on 16 September is, “30 Years of Healing the Ozone Together.” The theme is supported by the slogan, “**Ozone: All there is between you and UV.**”

The theme celebrates the collective efforts of the parties to the Vienna Convention and the Montreal Protocol in protecting the ozone layer over the past three decades, and the supporting slogan highlights the importance of the ozone layer in protecting life on Earth from the harmful effects of UV radiation.

As part of the commemorative activities, the Ozone Secretariat will conduct a smart digital campaign that will entail the dissemination of powerful communications products such as interactive videos, animations, infographics, posters and social media messages through various outlets to celebrate the many successes achieved under the ozone protection regime over the past 30 years. ... [Read More](#)

### Montreal Protocol Meetings Dates and Venues

- [Methyl Bromide Technical Options Committee 2014 Assessment Report](#)
- [Medical Technical Options Committee 2014 Assessment Report](#)

### Progress & Quadrennial Assessment Reports:

- Environmental Effect Assessment Panel ([EEAP](#))
- Scientific Assessment Panel ([SAP](#))
- Technology and Economic Assessment Panel ([TEAP](#))

### Halon Technical Options Committee Reports:

- [Halons Technical Options Committee 2014 Assessment Report \(Volume 1\)](#)
- [Halons Technical Options Committee 2014 Supplementary Report #1 - Civil Aviation \(Volume 2\)](#)
- [Halons Technical Options Committee 2014 Supplementary Report #2 - Global Halon 1211, 1301, and 2402 Banking \(Volume 3\)](#)
- [Technical Note #1- Revision 4 - Fire Protection Alternatives to Halon - 2014](#)
- [Technical Note #2 - Revision 2 - Halon Emission Reduction Strategies - 2014](#)
- [Technical Note #3 - Revision 2 - Explosion Protection - Halon Use and Alternatives - 2014](#)
- [Technical Note #4 - Recommend Practices for Recycling Halon and Halocarbon Alternatives - 2014](#)
- [Technical Note #5 - Halon Destruction - 2014](#)

## THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL



The Executive Committee of the Multilateral Fund 74<sup>th</sup> meeting took place in Montreal, Canada, 18 - 22 May 2015. The related documents are available [here](#)

▶ [Learn more](#)

## OZONACTION



Letter from Shamila Nair-Bedouelle, OzonAction Head, to the National Ozone Officers, on the International Day for the Preservation of the Ozone Layer.

As **International Day for the Preservation of the Ozone Layer**, 16 September, is fast approaching, and this year marks the **30<sup>th</sup> anniversary of the Vienna Convention for the Protection of the Ozone Layer**, UNEP OzonAction would like to invite you to begin your activities in commemoration of this significant treaty.

▶ [Read more](#)

**OzonAction at OEWG-36.** During the [36<sup>th</sup> Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol](#), OzonAction organized three side-events:

1. The Montreal Protocol and Human Health: How global action protects us from the ravages of ultraviolet radiation on 20 July 2015
2. Safe Use of Alternatives to HCFCs addressing flammable, higher toxicity and higher pressure alternatives in refrigeration and air-conditioning sector on 22 July 2015
3. AHRI-UNEP Initiative: Refrigerant Driving Licence on 23 July 2015



▶ UNEP, [OzonAction](#), July 2015

### New Publications and Factsheets Launched by OzonAction During the OEWG-36:



**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. ▶ [Read/Download](#)



**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. ▶ Read/Download in [English](#) | [French](#) | [Spanish](#)



**INFORMAL PRIOR-INFORMED CONSENT (iPIC)** - Supporting Compliance Through prevention of Illegal and Unwanted Trade in ODS - The 'informal Prior-Informed Consent' (iPIC) mechanism was launched in 2006 by the UNEP DTIE OzonAction as part of its work in providing assistance to developing countries to fulfil their commitments under the Montreal Protocol on Substances that Deplete the Ozone Layer. This initiative was developed in order to better manage trade in ozone depleting substances (ODS) that are controlled under the Protocol. iPIC has become a global voluntary initiative used by 113 like-minded states who wish to strengthen the implementation of their national licensing system for ozone depleting substances (ODS). In 2014, of the reported 141 iPIC consultations, 68% resulted in approved trade amounting to 2,257 metric tonnes of ODS. Rejections or cancellations of requests following iPIC consultations prevented unwanted trade in more than 545 metric tonnes of ODS including hydrochlorofluorocarbons (HCFCs) and halons. More recently iPIC is also being used to screen shipments of hydrofluorocarbons (HFC), which are not ODS. This short booklet briefly describes how the iPIC system works and its advantages, it provides some information on results and successes from iPIC in 2014 and encourages countries which are not yet members to join and to begin to reap the benefits of this initiative. ▶ [Read/Download](#)



**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. [▶Read/Download](#)



**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. [▶Read/Download](#)



**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. [▶Read/Download in English | French | Spanish](#)

### Factsheets:



[Safe Use of HCFC Alternatives in Refrigeration and Air-Conditioning: Flammable Refrigerants](#)



[Safe Use of HCFC Alternatives in Refrigeration and Air-Conditioning: Higher pressure refrigerants](#)



[Safe Use of HCFC Alternatives in Refrigeration and Air-Conditioning: Higher toxicity refrigerants](#)



[Free Trade Zones and trade in ODS](#)



[The Informal Prior-Informed Consent \(iPIC\) Mechanism](#)

▶ [Learn more from UNEP, OzonAction website](#)

### Other recently Launched Publications:



[Guide on Good Practices: Phasing out HCFCs in the Refrigeration and Air-conditioning Servicing Sector](#) -



[Phasing out HCFCs in Small and Medium-sized Foam Enterprises](#)

### Publications/ Factsheets Launched During MOP-26:



[Financing the Climate Co-benefits of the HCFC Phase-out](#)



[UNEP OzonAction CAP Achievements 2014](#)



[OzonAction Special Issue 2014: New Responsibilities under the HCFC Phase-out](#)



[Demonstrating the feasibility of R-290 based AC manufacturing: China's Midea and Meizhi case](#)



[Low-GWP Alternative for Small Rigid PU Foam Enterprises](#)

▶ [Learn more](#) about OzonAction publications and events throughout the MOP-26





# EVENTS

## 2015



The **24<sup>th</sup> International Congress of Refrigeration**, 16-22 August 2015, Yokohama, Japan.

See more events from the [IIR website](#)



**The Future of HVAC Conference 2015**, 18-19 August 2015, Melbourne, Australia.



**Équipements frigorifiques à fluides "naturels" - Mise en service et maintenance (COSTIC)**, 2-4 Septembre 2015, Saint-Rémy-lès-Chevreuse - France



**CCAC Working Group Meeting**, 8-9 September 2015, Paris, France. The Working Group of the Climate and Clean Air Coalition will meet in Paris on 8 and 9 September to review and further elaborate on the 5-Year Strategic Plan that will outline the Coalition's strategy and actions for 2015 – 2020, discuss outreach strategy and communication plan focusing on the Road to Paris and CCAC's presence at COP21, as well as review and approve new funding requests from initiatives.



**CLIMAMED** The 8<sup>th</sup> Mediterranean Congress of Heating, Ventilation and Air-Conditioning, 10-11 September 2015, Antibes-Juan-les-Pins, France



**Salon interprofessionnel du froid et de ses applications (SIFA)**, 13 au 15 octobre 2015, Event Center (Porte de la Villette), Paris, France



**Latin America Cold Chain Congress**, 28 - 29 September 2015, Guadalajara, Mexico, The Latin America Cold Chain Congress is the cold chain industry's premier event in Latin America that provides world-class presentations on operations, technology, engineer, and food safety...



**4<sup>th</sup> European Heat Pump Summit**, 20-21 October 2015, Nuremberg, Germany.



**Indian Cold Chain Expo**, 17- 18 November 2015, Zirakpur, Chandigarh, India, India's first Refrigerated Warehousing, Cold Storage Construction, Refrigerated Logistics and Refrigerated Transportation Event.



**Salon Energies Froid**, 2 - 3 Décembre 2015, Nantes, France.



**India Cold Chain Show 2015** Conference (ICCS), 16 - 18 December 2015, Goregaon (east), Mumbai, is the leading exhibition and conference for cold chain, cold logistics, temperature controlling, refrigeration, storage, distribution and cold supply chain sectors...

[View details](#) | [are you attending?](#)

## 2016



**Aqua-therm Prague**, 1 - 4 March 2016, Prague, Czech Republic, 21<sup>st</sup> International Trade Fair for Heating, Ventilation, Air Conditioning, Measuring, Regulation, Sanitary and Environmental Technology



The [12<sup>th</sup> Fumigants & Pheromones Conference](#), 6-9 March 2016, Adelaide, Australia



[China Refrigeration](#), Trade Fair, 7- 9 April 2016, Beijing, Republic of China



[12<sup>th</sup> IIR Gustav Lorentzen Natural Working Fluids Conference](#), 21 - 24 August 2016, Edinburgh, Scotland. World experts gather in Edinburgh to discuss the future of natural working fluid...



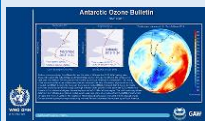
## READING



A new publication, [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.



[Our Planet: Time for Global Action](#) - As we move towards the historic post-2015 Summit at the 70<sup>th</sup> UN General Assembly next September, governments will be expected to adopt a transformational sustainable development agenda, including the finalization of the Sustainable Development Goals. The March 2015 issue emphasizes the importance of an integrated and universal approach to the Sustainable Development Goals and the post-2015 agenda. ...



[WMO Antarctic Ozone 2014 Bulletins](#) - The World Meteorological Organization Secretariat issues 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.



[Summary of The meeting of the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants \(CCAC\) Working Group took place from 24-25 February 2015 in Kathmandu, Nepal](#). More than 100 participants attended the meeting which focused on developing a 5-year Strategic Plan for the CCAC, as requested by Ministers and Heads of the CCAC Partner organizations. During the meeting, the Working Group made progress on developing key elements of the Strategic Plan. It also approved the SAP Work Plan, together with six funding requests for Initiatives on Agriculture, Diesel, Hydrofluorocarbons (HFCs), Regional Assessment and Supporting National Planning for Action on SLCPs (SNAP). The Working Group also adopted decisions on Demonstrating Impact, the 5-Year Strategic Plan, and the Road to Paris. ...



[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. The revision includes an Annex II, which lists training facilities in AREA countries. The list provides website addresses and information on the type of training (theoretical and/or practical) by type of low GWP refrigerant.



Latest issue of Centro Studi Galileo magazine [Industria & Formazione](#).



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



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



[Primer on Hydrofluorocarbons](#), Fast action under the Montreal Protocol can limit growth of HFCs, prevent up to 100 billion tonnes of CO<sub>2</sub>-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 Grabel. 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



[Principles of Heating, Ventilating and Air-Conditioning, 7<sup>th</sup> Ed.](#) ASHRAE



A first edition, the IIR guide “[CO<sub>2</sub> 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.



[GUIDE to Natural Refrigerants in China - State of the Industry 2015](#) - Launched by shecco - is the first-ever in-depth report on the use of natural refrigerants - carbon dioxide (CO<sub>2</sub>), hydrocarbons (HCs), ammonia (NH<sub>3</sub>), water (H<sub>2</sub>O) and air - in China. The GUIDE done in collaboration with the Chinese Association of Refrigeration (CAR) identifies market trends, business opportunities, policy drivers, and outlines suitable applications for natural refrigerants in the country’s cooling, heating and refrigeration sectors...

## Chlorofluorocarbon Market: Global Industry Analysis and Forecast 2014 – 2020



## Non-Melanoma Skin Cancer Market – Global Size, Share, Industry Segments Analysis and Forecast to 2020, by Persistence Market Research



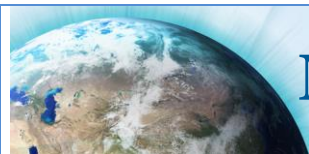
**Research Shines Light on Organic Fruit, Food Safety** - “UVC radiation is present in sunlight; however, it is completely absorbed by the ozone layer and Earth's atmosphere”...



**New Theories and Predictions on the Ozone Hole and Climate Change**, Author: Qing-Bin Lu, University of Waterloo, Canada



**Making History: Negotiating a Global Agreement on HFCs under the Montreal Protocol**, analysing the current amendment proposals for an HFC phase-down. A report launched by the Environmental Investigation Agency (EIA) during the recent OEWG 36.



## MISCELLANEOUS

**Job opening** for HPMP Stage 2 consultancy post is now posted on the UN Inspira system. [Learn more/Apply](#) before 7 August 2015



**Promoting Ozone and Climate Friendly Refrigerants and Air Conditioning (R/AC) Technologies through Sustainable Public Procurement** – Webinar, Thursday 30 July at 3 p.m. CEST, hosted by the United Nations Environment Programme Division of Technology, Industry and Economics and co-organized with UNEP Regional Office for Asia and the Pacific. This webinar was organized as part of the Sustainable Public Procurement programme’s activities within the 10-Year Framework of Programmes on Sustainable Consumption and Production. The presentations and recorded version of the webinar is available [here](#)



US EPA GreenChill Webinar: **“What to Expect When Expecting an EPA Inspector”**  
Date: Thursday, 13 August 2015 Time: 2:00 pm to 3:00 pm (Eastern time) Description: This webinar will cover how EPA conducts investigations at commercial refrigeration facilities (e.g., supermarkets), including requesting information and inspecting facilities. It will also cover the key aspects of the 40 CFR Part 82 rules that would be covered in a general investigation of commercial refrigeration and what records and activities EPA is looking for when it investigates.

To join the webinar: 1. Go to <https://epa.connectsolutions.com/what-to-expect/> 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#

Formation 1 jour : **F-Gas : comment la mettre en œuvre ?** Savoir répondre aux exigences réglementaires. Après cette journée de formation, le participant maîtrisera les exigences des réglementations sur les fluides frigorigènes et sera en mesure de :

- préparer un retrofit sur les plans réglementaire et technique,
- appliquer les règles pour le Bordereau de Suivi de Déchets,
- connaître les obligations liées à la déclaration des quantités de fluides existant sur un site et l'utilisation des hydrocarbures,
- calculer les quantités maximales autorisées de fluides frigorigènes suivant le type d'ERP,
- réaliser des contrôles d'étanchéité en respectant la réglementation.

Lyon le 19 novembre 2015 | Nantes le 26 novembre 2015 | Paris le 1<sup>er</sup> décembre 2015



**Two further webinars have been organised as an introduction to the REAL Zero and REAL Alternatives e-learning programmes.** REAL Alternatives builds on the established REAL Skills Europe & REAL Zero containment initiatives to address the skills shortage amongst acr technicians working with the alternative refrigerants CO<sub>2</sub>, hydrocarbons, ammonia and HFOs. It provides a European-wide learning programme designed to improve knowledge in the service and maintenance of these refrigerants in new systems from the point of view of safety, efficiency, reliability and containment. The one-hour webinars, being broadcast on October 22 and November 17, will include presentations from training specialist Jane Gartshore and IoR president Graeme Maidment. The webinars will be recorded for anyone not able to listen live.

To register for the webinar on October 22 at 1pm GMT/BST, click [here](#). For the webinar on November 17, also at 1pm GMT/BST, click [here](#)



Exclusive Interview: Jongsoo Jeong of Waseda University discusses the “**role of solar absorption chillers in warm ambient temperatures**”

**New Research Uses UVC Light on Fruits to Kill Pathogens** - New research conducted at Washington State University has found that ultraviolet C (UVC) light can kill foodborne pathogens on the surface of some fruits. This technology may be a good alternative for organic fruit processors who don't want to use chemicals on their products and must comply with the Food Safety Modernization Act (FSMA) standards to help prevent outbreaks.

The **Global Cold Chain Directory**, is an annual buyer's guide featuring listings of GCCA member companies from every sector of the cold chain, including cold storage warehouses, logistics providers, construction companies, and industry suppliers. The directory is available in print, [online](#), and, now, as a mobile app. [Browse the Directory](#). Download the GCCA Directory App - Download the new mobile app of the Global Cold Chain Directory for a convenient way to access the world's largest directory of cold chain providers on tablets or Smart Phones. The app is available for complimentary download in [iTunes App Store](#) or [Google Play](#).



**ASEAN Japan Chemical Safety Database (AJCSD)**. The on-line database is a product of a two year-long and ongoing collaborative effort among Japan and each of the member states of the Association of Southeast Asian Nations (ASEAN). AJCSD is intended to serve as an information sharing platform for government agencies as well as a comprehensive compliance resource for chemical manufacturers and suppliers ...



The **AIRAH Awards 2015** - Nominations are now open for AIRAH's annual accolades, which acknowledge the HVAC&R industry's outstanding achievements.

Nominations close: Monday, 3 August 2015.



MONTREAL PROTOCOL  
WHO'S WHO

## The Montreal Protocol Who's Who

*Nominate Ozone Layer Protection Champion*

*From Your Country /Region >>*

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

**Disclaimer:** The United Nations Environment Programme Division of Technology, Industry and Economics (UNEP DTIE) OzonAction Programme provides OzoNews as a free service for internal, non-commercial use by members of the Montreal Protocol community. Since its inception in January 2000, the goal of OzoNews is to provide current news relating to ozone depletion and the implementation of the Montreal Protocol, to stimulate discussion and promote cooperation in support of compliance with the Montreal Protocol. With the exception of items written by UNEP and occasional contributions solicited from other organizations, the news is sourced from on-line newspapers, journals and websites. The views expressed in articles written by external authors are solely the viewpoints of those authors and do not represent the policy or viewpoint of UNEP. While UNEP strives to avoid inclusion of misleading or inaccurate information, it is ultimately the responsibility of the reader to evaluate the accuracy of any news article in OzoNews. The citing of commercial technologies, products or services does not constitute endorsement of those items by UNEP.

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

### Follow OzonAction on:



<http://www.facebook.com/ozonaction>



<http://www.slideshare.net/ozonaction>



<http://twitter.com/ozonaction>



<http://www.youtube.com/ozonaction>



**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:**

Mrs. Samira Korban-de Gobert, Tel. (+33) 1 44.37.14.52,  
[samira.degobert@unep.org](mailto:samira.degobert@unep.org)

To unsubscribe, send a blank message to [samira.degobert@unep.org](mailto:samira.degobert@unep.org) with 'unsubscribe OzoNews' as the subject.