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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. Summary of the 27th Meeting of the Parties to the Montreal Protocol (MOP 27), 29-30 October and 1-5 November 2015 | Dubai, United Arab Emirates (UAE)



The twenty-seventh Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (MOP 27) met from 1-5 November 2015, in Dubai, United Arab Emirates (UAE). Over 500 participants from governments, UN agencies, intergovernmental and non-governmental organizations, academia, and industry attended the joint meeting. MOP 27 adopted a number of substantive and procedural decisions.

Substantive decisions included: essential-use exemptions (EUEs) and critical-use exemptions (CUEs); avoiding the unwanted import of products and equipment containing or relying on hydrochlorofluorocarbons (HCFCs); and a Technology and Economic Assessment Panel (TEAP) report on alternatives to ozone depleting substances (ODS). Procedural decisions adopted include: budget; organizational issues related to the TEAP; and membership of Montreal Protocol bodies for 2015.

MOP 27 immediately followed the two-day resumed session of the 36th Open-ended Working Group (OEWG 36), which had agreed on a mandate for a contact group on the feasibility and ways of managing hydrofluorocarbons (HFCs).

The contact group was established and HFCs were the “major topic” under debate throughout the week. Following protracted negotiations that finally concluded in the early hours of Friday morning, parties agreed to a “roadmap” for negotiating an HFC amendment; this agreement included provision for an additional OEWG meeting and an extraordinary MOP in 2016.

- [IISD Reporting Services](#), through its ENB Meeting Coverage, provides daily web coverage, reports, summary and analysis report from the Resumed 36OEWG and 27th Meeting of the Parties to the Montreal Protocol, taking place from 29 to 30 October and 1 to 5 November 2015, from Dubai, United Arab Emirates (UAE).

2. Montreal Protocol Parties Devise Way Forward to Protect Climate Ahead of Paris COP 21

Dubai, 6 November 2015 – As the world counts down to the UN Climate Change Conference in Paris at the end of this month, the 197 parties to the Montreal Protocol on Substances that Deplete the Ozone Layer have agreed on a “Dubai Pathway” for controlling climate-change-inducing hydrofluorocarbons (HFCs).



The parties agreed to work together, within the Montreal Protocol, towards an HFC amendment in 2016 by first resolving challenges and generating solutions in the contact group on the feasibility and ways of managing HFCs at Montreal Protocol meetings. This outcome was agreed after extensive negotiations during the 27th Meeting of the Parties (MOP27) to the Protocol, hosted by the Government of the United Arab Emirates in Dubai from 1 to 5 November.

The parties recognized the progress made at MOP27 on discussing the challenges on feasibility and ways of managing HFCs, on issues related to flexibility of implementation, second and third stage conversions, guidance to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, enabling activities for capacity building, and the need for an exemption for high ambient temperature countries.

Further progress still needs to be made with respect to other challenges. The parties will continue their deliberations in 2016 with a series of Open-Ended Working Group meetings and others, including an extraordinary Meeting of the Parties.

Achim Steiner, United Nations Environment Programme Executive Director, said, “Hydrofluorocarbons may not cause direct ozone damage, like the chlorofluorocarbons they replace, but many of them contribute to greenhouse emissions. In fact some estimates put their global warming impact at up to 10,000 times that of carbon dioxide. If we don't get this genie back into the bottle quickly then, by 2050, we could be looking at as big a problem as the one we have just solved.”

Growing HFC emissions, climate benefits of phase-down

HFCs are chemicals used in air conditioning, refrigeration, foams and aerosols as replacements for many ozone-depleting substances that are being phased out under the Montreal Protocol.

HFC emissions are growing rapidly, at a rate of about 7 per cent annually. If the current mix of HFCs is unchanged, increasing demand could result in HFC emissions of up to 8.8 gigatonnes carbon dioxide equivalent per year by 2050. This could jeopardize the substantial climate benefits achieved through the Montreal Protocol, which has averted greenhouse gas emissions equivalent to more than 135 billion tonnes of carbon dioxide.

HFC phase-down would provide a sizable benefit for the climate. It would avoid the equivalent of 100 billion tonnes of carbon dioxide and more than 0.5°C of warming by 2050, according to a report by the Lawrence Berkeley National Laboratory. It would also bring significant energy efficiency benefits that past phase-outs have always catalyzed when a refrigerant was changed.

Opening the high-level segment of MOP27 on 4 November, United Arab Emirates Minister of Environment and Water, Rashid Ahmed Bin Fahad, stated that a delay in reaching an agreement on the management of HFCs would limit international efforts in reducing the effects of climate change. He urged the parties to join together to strengthen the Montreal Protocol and support climate efforts for the benefit of humanity.

Extraordinary return on investment

The Montreal Protocol had delivered an extraordinary return on investment, with an investment of \$3.5 billion expected to result in global health benefits estimated at US\$1.8 trillion and avoided damages to agriculture, fisheries, and materials worth US\$460 billion by the middle of the century.

MOP27 included a discussion on how the institutions and the mechanisms of the Montreal Protocol could assist parties in managing HFCs by the following panellists: Bin Fahad, Steiner, Gina McCarthy, Administrator, Environmental Protection Agency, United States of America; Mr. Xavier Sticker, Ambassador for the Environment, Foreign Affairs Department, France; Mr. Greg Hunt, Minister for the Environment, Australia; Mr. Abdullahi Majeed, State Minister, Ministry of Environment and Energy, the Maldives; and Mr. Manoj Kumar Singh, Joint Secretary, Ministry of Environment, Forest and Climate Change, India. The roundtable discussion was moderated by Fernando Lugris, Deputy Director-General, Ministry of Foreign Affairs, Uruguay.

Contact:

[Shereen Zorba](#), Head of News and Media, United Nations Environment Programme,

[Dan Teng'o](#), Communications Officer, Ozone Secretariat

See Also:

[**Advance unedited compilation**](#) of the decisions adopted by the Twenty-Seventh Meeting of the Parties to the Montreal Protocol, held recently in Dubai, United Arab Emirates, from 1 to 5 November 2015. Although the final compilation will be part of the report of the Meeting, the Ozone Secretariat felt that this advance unedited copy would assist you in having an overall information of the decisions taken at the 27th MOP.



3. A Breath of Fresh Air

The decision to use the Montreal Protocol to reduce the impact of refrigerants on global warming is a step forward ahead of the Paris climate summit.

The world took a step in the right direction in the early hours of 6 November. Meeting in Dubai, 195 governments decided to pull the management of hydrofluorocarbons (HFCs) under the umbrella of the Montreal Protocol, an international agreement that governments signed in 1987 to protect the stratospheric ozone layer from damage by chlorofluorocarbons (CFCs). HFCs are ozone-friendly replacements for CFCs and are often used as refrigerants.

Unfortunately, many are also powerful greenhouse gases, and their use is expected to skyrocket over the coming decades. Although a few governments were successful in delaying negotiation of the arrangement's details, the agreement to move forward is nonetheless welcome - and long overdue.

The United Nations Environment Programme estimates that HFC emissions are rising roughly 7% annually thanks in part to demand for air conditioners in emerging economies such as Brazil, India and Indonesia. By 2050, global HFC emissions could hit the equivalent of 8.8 billion tonnes of carbon dioxide, roughly equal to the current carbon emissions of the United States and European Union combined. The decision to regulate HFCs under the Montreal Protocol bodes well for the UN climate summit in Paris, which begins on 30 November. The Montreal Protocol is a well-oiled machine that has already proved its effectiveness and value among both industry and government leaders. In theory, dragging HFCs under its umbrella gives climate negotiators in Paris one less thing to worry about. All told, aggressively regulating HFCs could reduce global warming by an estimated 0.5 °C.

Unfortunately, some governments still seem to be hedging their bets. In particular, India, Saudi Arabia and Kuwait pushed to delay consideration of detailed amendments to the Montreal Protocol until next year. Other global leaders, including US President Barack Obama, who has negotiated agreements on HFCs with leaders in India, China and Pakistan, will need to maintain pressure.[...]

► [Nature](#), VOL 527, 11 November 2015

See also:

[Countries Agree to Use Montreal Protocol to Phase Down HFCs](#), The Huffington Post, The Blog, by Prof. Durwood Zaelke, Founder, Institute for Governance and Sustainable Development, 5 November 2015

4. Synthesis of the 2014 Reports of the Scientific, Environmental Effects, and Technology & Economic Assessment Panels of the Montreal Protocol



The depletion of the ozone layer and the consequent increase in UV radiation at the surface of Earth has been an issue for over forty years. Over that period, there has been enormous progress in our understanding of the science behind ozone layer depletion and its recovery, the effects of ozone layer changes on surface UV radiation, and the consequences of changes in UV radiation on humans and the environment. Under the auspices of the Montreal Protocol, policy makers, industry, scientists and technologists have developed a collaborative process that has enabled a better understanding of the science, the environmental impacts, and the changes in technology that are necessary to safeguard society. This enables the Parties to the Protocol to balance the costs of action versus inaction, and assess the feasibility of coordinated societal, national and international action. Central to this process, the Montreal Protocol mandates regular independent updates on all these topics. Accordingly, the Scientific Assessment Panel (SAP), the Environmental Effects Assessment Panel (EEAP), and the Technology and Economic Assessment Panel (TEAP) have carried out major assessments at least every four years during the past three decades. Pages 5, 7 and 8 [of this Synthesis report] summarize major aspects of the ozone depletion issue and the Montreal Protocol.

This Synthesis Report presents the most recent, updated information and is particularly timely because: 1) Just over 40 years ago, Molina and Rowland's landmark paper was published, which linked man-made chlorofluorocarbons with ozone layer depletion; 2) 30 years ago, the Antarctic ozone hole was discovered – it is the 20th century's most dramatic manifestation of global environmental change; 3) 30 years ago, the Vienna Convention was adopted in 1985, and 2015 celebrates the thirtieth anniversary of this convention. This convention was followed soon after by the Montreal Protocol in 1987, providing the highly successful international framework to address the issue of ozone layer depletion. Given these momentous landmarks, it is appropriate not just to synthesize the most recent information but also to take into account the wider perspective of looking ahead and looking back over the last four decades, including developments in the science and

technology and in the regulatory actions during that period.



► Read/Download the full Synthesis [report](#)

5. OzonAction Events during the 27th Meeting of the Parties to the Montreal Protocol, 1-5 November 2015, Dubai, United Arab Emirates (UAE)

1- [Technical Forum on Research Projects for Alternative Refrigerants in High Ambient Countries](#), 31 October 2015

The Forum focused on presenting the findings and outcomes of three key research projects addressed the issue of alternative refrigerants for A/Cs in high ambient operating conditions i.e. PRAHA, AREP-II and US-High Ambient Project. It also offered chance to highlight ongoing related research/work on the high- ambient issue.

Presentations by:

- Stephen R. Yurek, AHRI - [Our Refrigerant Future: Research, Education, Collaboration](#) | [Post - 2015 Development Agenda, SDGs](#)
- Omar Abdelaziz, ORNL and Suely Carvalho, IPEN - [Alternative Refrigerant Evaluation for High Ambient Temperature Environments: R-22 and R-410A Alternatives for Mini-Split Air Conditioners](#)
- Karim Amrane and Xudong Wang, AHRI - [Update on Phase II of the AHRI Low GWP Alternative Refrigerants Evaluation Program \(Low-GWP AREP\)](#)
- Karim Amrane, AHRI - [Update on ASHRAE 15 "Safety Standard for Refrigeration Systems"](#)



- Walid Chakroun, Kuwait University - [Assessment of Alternative Refrigerants](#)
- Bassam Elassaad, Independent Expert - [Key Findings and Project Outcomes](#)
- Tetsuji Okada, JRAIA - [Transition of Refrigerants for Air-conditioners in High Ambient Temperature Region](#)
- Marco Buoni, AREA - [Blended Learning for Alternative Refrigerants in High Ambient Countries](#)
- Daniel Colbourne and Juergen Usinger, GIZ Proklima - [Natural Refrigerants - Safe, Efficient and Reliable Use as Alternatives to HFC](#)

2- [Management of ODS in Fisheries](#), 1 November 2015

The use of refrigeration technology is an essential requirement at all stages of the fisheries industry: from catch to processing, to food plate. One of the most common refrigerants used in the fishing industry is hydrochlorofluorocarbons (HCFC-22), a controlled ozone depleting substance (ODS) under the Montreal Protocol (MP). The fisheries sector, both marine and on-land processing, has so far not been sufficiently studied or engaged in the HCFC-22 phase-out processes. This data gap can have implications for both compliance with the Montreal Protocol and the industry that is dependent on refrigeration technology. Opening by Dr. Shamila Nair-Bedouelle, Head of OzonAction, UNEP DTIE, and H.E. Abdoulaye Balde, Minister of Environment and Sustainable Development, Senegal.

Presentations by:

- [Artie Dubrie](#), OzonAction UNEP CAP ROAP
- Didier Coulomb, International Institute of Refrigeration (IIR)
- [Paul de Larminat](#), Industry technology provider
- [Ribanataake Awira](#), Pacific Islands Fisheries Forum
- [Miruza Mohamed](#), Maldives Ministry of Environment and Energy
- [Vika Rogers](#), Fiji, Ministry of Local Government, Housing & Environment
- [Alice Gaustad](#), Norwegian Environmental Agency

3- [Energy Efficiency & Refrigerants Management towards Sustainable Cold Chain](#), 1 November 2015

Refrigeration is crucial for cold-chain industry and food security which is one of the key post-2015 sustainable development goals recently adopted by world leaders. The integration of food security, energy efficiency and climate actions in combination with managing refrigerants and reducing emissions will be of great value and high impact on economies especially in developing countries.

Presentations by:

- Didier Coulomb, IIR, [Sustainable Cold Chain, Energy Efficiency and Refrigerants Management](#)
- Alaa E. Olama, IIR, [The Cold Chain in High Ambient Temperature Countries: Challenges, solutions, future technologies and Opportunities](#).

4- [Addressing the challenges of the RAC Servicing Sector](#), 2 November 2015

The event aims to better understand the importance of certification in ensuring the installation of safe and reliable equipment and provision of quality services through adherence to applicable standards leading to minimizing of refrigerant emissions and thus reducing demand. It will also demonstrate to service technicians and enterprises why it is in their interest to participate in certification schemes. Certification in the refrigeration and air-conditioning sector can act as an 'added value' for technicians to prove their competence and proficiency, particularly when they change employers or seek new jobs. Certification is also an important element in customer protection and may prompt customers to put pressure on industry.

Presentations by:

- Khaled Klaly, UNEP CAP ROWA, [Introduction & brief overview of the importance of RAC certification in achieving the desired ODS reduction in the servicing sector](#)
- Marco Buoni, Centro Studi Galileo, [Establishing and implementing the certification scheme - the development process, the enforcement, registration/certification and monitoring mechanisms, training component](#)
- AHRI-UNEP initiative, [Refrigerant Driving Licence \(RDL\)](#)

5- [Managing ODSs in Refrigeration and Air-Conditioning Sectors](#), 2 November 2015

Special course for Engineering Colleges/Institutes - Around 10 years back, UNEP cooperated with two academic institutes in West Asia in developing special course for ODS management for engineering undergraduates. The course was offered to senior engineering students in the two universities i.e. Kuwait University (KU) and the American University in Beirut (AUB) where it was successfully introduced for few years. This year, UNEP in cooperation with the government of Lebanon that took the initiative to revise this course, update it in accordance with the latest global policy and technological development triggered by the Montreal Protocol and represent it in a way that can be ready for introduction by any other engineering college/institute. The course is planned to be ready for launching and circulation for interested institutes during the first quarter of 2016.

FACT SHEETS

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

Fact sheet - Management of ODSs in the Global Fishing Industry- Fisheries make a major contribution to the economies of many developing countries through foreign exchange earnings and employment creation. In the Pacific region, for example, the Western and Central Pacific - Commission Area (WCP-CA) reported purse seine fishing produced 1.9 million tonnes of tuna, valued at over US\$3.2 billion. Of this, 79 per cent was from the Exclusive Economic Zones (EEZs) of Pacific Islands Forum Fisheries Agency (FFA) member countries. Longline vessels caught an estimated 269,000 tonnes, worth more than US\$1.7 billion in WCP-CA in 2014.

► For more information, please visit [OzonAction Branch MOP 27 Webpage](#)

► See other [MOP27 Side events](#)



6. Montreal Protocol Reduces Emissions and Protects Climate!

As the international community proudly celebrates the 30th anniversary of the Vienna Convention for Protection of the Ozone Layer, the success story of protecting the ozone layer resonates in all fora. Today the world boasts of having phased out 98 per cent of ozone depleting substances (ODS). However, the use of ODS continues to increase in technologies which are indispensable to life on Earth.

The achievements of the refrigeration and air conditioning (RAC) sector over the past century are astounding: they have created a revolution in equipment and refrigerants to meet consumer demands, improve livelihoods and address environmental challenges.

Today, the emissions of refrigerants, as well as the carbon dioxide emissions generated from the electricity used to run the equipment, is at the heart of global debates on climate change, ozone layer protection and energy efficiency.

Globally, refrigeration consumes 15 to 20 per cent of the world's total electricity. An estimated 185 billion KWh of energy is used annually on residential cooling. Thus we urgently need refrigeration and cooling options that are both energy efficient and climate friendly.

Not only does energy efficiency reduce or avoid greenhouse gas emissions, but it can also increase productivity and sustainability through the delivery of energy savings, and support social development by increasing employment and energy security.

Indeed, energy efficiency is the area where most emission reductions can be achieved in the short term and is therefore critical to combating climate change. Energy efficient technologies use less energy to provide the same or better service. When deployed in large numbers, they can substantially reduce greenhouse gas emissions.

This year, 2015, is crucial for global and regional action on the environment and sustainable development. In late September 2015, the world leaders meeting at the United Nations headquarters in New York adopted a new global plan of action known as the Sustainable Development Goals (SDGs). Defining the next phase in international development, the SDGs comprise 17 goals and 169 targets aimed at resolving the social, economic and environmental problems troubling the world. The SDGs aim to ensure lasting protection of our planet and its natural resources. They show that efforts to eradicate energy poverty, promote universal access to cleaner forms of energy, and a doubling of energy efficiency would go a long way in mitigating the worst impacts of climate change.

We in the global ozone community are very proud that the Montreal Protocol is contributing both directly and indirectly to energy efficiency, pursuit of SDGs, promoting public health and protecting the environment. The Montreal Protocol has far exceeded its original aims. While protecting the ozone layer, it has contributed

substantially to climate mitigation, social development, food safety and security, public health and the creation of large numbers of green jobs.

Reducing the production and use of HFCs, refrigerants/ foaming agents with global warming potentials (GWP) hundreds to thousands of times higher than CO₂ is the largest, fastest and most cost effective short-term climate mitigation option currently available.

A variety of climate-friendly, low GWP alternatives for refrigerants and foaming agents are currently available. These include carbon dioxide, ammonia, hydrocarbon, low GWP HFCs and some ‘not-in-kind’ technologies such as solar technologies and district cooling.

In December 2015, the United Nations Climate Change Conference, or COP21, will be held in Paris, where governments hope to achieve a legally binding and universal agreement on climate change. The road to Paris has not been an easy one, but as the 30 year history of ozone protection shows, nations can and do rise to meet global environmental threats.

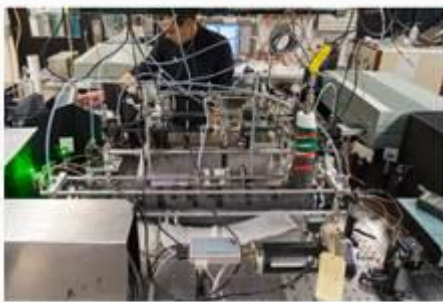
Climate change represents one of the greatest challenges to humanity. But it is also an opportunity to move to a low-carbon, resource-efficient Green Economy. The Montreal Protocol is already contributing in all its dimensions to the climate, energy and ozone nexus and will continue to serve as the beacon of hope for environmental sustainability.

Dr Shamila Nair-Bedouelle, Head OzonAction, UNEP DTIE

► [OzonAction Special Issue 2015: 30 Years of Healing Ozone Together: BEYOND HCFCs](#)



7. New Study Finds Some Chemicals Less Damaging to Ozone Layer Can Degrade to Long-Lived Greenhouse Gases



Aaron Jubb works on a laboratory setup used to measure reactivity and photochemistry of atmospherically relevant species. Credit: Will von Douster/ NOAA.

Some substitutes for ozone-damaging chemicals being phased out worldwide under international agreements are themselves potent greenhouse gases and contribute to warming. Now, a new study published Nov. 2 in *Geophysical Research Letters*, a publication of the American Geophysical Union, shows for the first time how some of those replacement chemicals can break down in the atmosphere to form a greenhouse gas that can persist for millennia, much longer than the substitute chemicals themselves.

Specifically, when some chemicals widely used as refrigerants break down in the stratosphere—a layer in the middle atmosphere—under some conditions, they can form a potent greenhouse gas that lasts for up to 50,000 years, according to scientists from the Cooperative

Institute for Research in Environmental Sciences (CIRES) at the University of Colorado Boulder and the NOAA Earth System Research Laboratory (ESRL) in Boulder.

“This compound, carbon tetrafluoride or CF₄, essentially lasts forever because there aren’t any known removal mechanisms in the atmosphere,” said James Burkholder, a research chemist at NOAA ESRL and lead author of the study.

Burkholder’s colleague Aaron Jubb, a CIRES scientist working at NOAA ESRL and now at Oak Ridge National Laboratory, did the laboratory work showing how CF₄ can be made from some halocarbons, chemicals that include hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs) and are substitutes for the more ozone-damaging chemicals that have largely been phased out. Jubb started with trifluoroacetyl fluoride—a compound produced in the atmosphere when some halocarbons breaks down—exposed it to short-wavelength UV radiation, and looked at the reaction products that formed. CF₄ was one of those breakdown products.

The amount of CF₄ produced by this photochemical process was shown to be a small fraction of atmospheric CF₄; industrial sources are much larger emitters of CF₄. Still, identifying this particular source of such a potent and lasting greenhouse gas is important, particularly since its production could continue to grow depending on which “parent” products are used by industry.

“We really need to understand the chemistry of the compounds we use,” Jubb said. “Even as we move towards shorter-lived halocarbons for industrial use, during atmospheric degradation they can produce a long-lived atmospheric effect.”

This work was supported in part by NOAA's Atmospheric Chemistry, Carbon Cycle, and Climate (AC4) Program and NASA's Atmospheric Composition Program.

CIRES is a partnership of NOAA and CU-Boulder.

► [American Geophysical Union \(AGU\)](#), 3 November 2015

8. Management and Destruction of Existing Ozone Depleting Substances Banks

The Montreal Protocol has been effectively restricting the production and consumption of ODS. The activities under the Montreal Protocol have shown their effect: The ozone layer has not deteriorated further since 2000 and is believed to start recovering.

However, extensive use of ODS over the past decades have led to an accumulation of ODS banks. The management of these banks is not covered by the Montreal Protocol, but there has been an increasing awareness of the problems related to ODS banks since 2005, when TEAP published a first report on the extent of ODS banks: Emissions from ODS banks contribute significantly to climate change and the depletion of the ozone layer. Reducing these emissions by destroying ODS banks could accelerate the recovery of the ozone layer by 6.5 years. Fast reactions are however urgently needed because ODS are successively released from the banks. The most important ODS are halons, CFCs, HCFCs and other halocarbons such as carbon tetrachloride and methyl chloroform. There are no significant banks for the latter and halons are intended for recycling and re-use. Consequently the most important substance groups are CFC and HCFC, predominately found in the refrigeration and air conditioning and foam sectors.

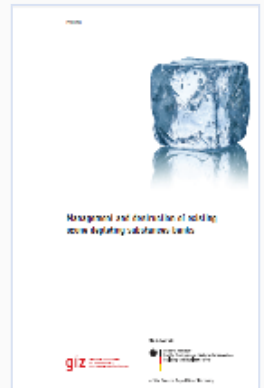
Initial efforts are being made in developing countries with respect to ODS bank management. Halon bank management was introduced from the beginning with the aim to reuse halons as long as possible. Other activities include demonstration projects for CFC and HCFC destruction in several developing countries, as decided by the Multilateral Fund in 2009. Still, ODS bank management is in its infancy in developing countries. The halon bank management is working with varying success only. The destruction demonstration projects appear insufficient to provide proper guidance on establishing national frameworks and to follow long term effective strategies. Thus there is a strong need to quickly extend efforts in ODS bank management, avoiding negative environmental impacts. A successful ODS bank management needs a sound understanding of existing ODS banks, technical feasibility of ODS recovery and destruction, identification of associated costs as well as barriers and appropriate policy measures.

Reducing CFC emissions in the RAC and foam sectors result in the highest benefits for both the climate and the ozone layer. The largest CFC amounts (metric tonnes) are found in the commercial and domestic refrigeration subsector (refrigerants and blowing agents). As establishing an ODS bank management will not be substance specific, HCFC from the RAC sectors also will be covered, which is particularly important to fight climate change. HCFCs are dominantly found in the commercial refrigeration and stationary AC subsector. Overall, the most important subsectors are the commercial and domestic refrigeration subsectors and the stationary air conditioning subsector and the appliances within these subsectors should be given preference for ODS bank management.

These subsectors can also be managed with comparably low effort regarding the technical feasibility and costs of ODS bank management. Because of relatively low costs, industrial refrigeration should be part of ODS bank management, even though little amounts are found in this subsector. A significant part of CFC blowing agents (~ 50 %, metric tonnes) is found in construction foams used for buildings, but at the moment it requires high effort to recover ODS from these foams. Furthermore, ODS banks in construction foam are not diminishing as quickly as in RAC equipment due to long building lifetimes. Thus foam subsectors are currently not a priority for ODS bank management. [...]

In general a number of policy measures are required to establish ODS bank management. The most promising policy measures are regulations and enforcement, the development of technical standards and economic instruments to establish a sustainable financing mechanism e.g. through EPR [Extended Producer Responsibility] schemes, as well as accompanying measures such as training and certification of technicians. The introduction of laws typically goes in parallel with educational measures such as technicians training, awareness raising and ideally mainstreaming environmental protection into government and civil society.

In developing countries where most banks are still not recovered, EPR schemes – particularly suitable for appliances are generally preferable over financing schemes depending on the voluntary carbon market, because only EPR schemes provide a long term stable and sufficient incentive to invest in environmentally safe



technology.

► [Read/Download the Publication](#), GIZ-Proklima International, 16 November 2015



ASIA PACIFIC

9. Ozone Protection School Speech Competition Reaches Thousands in Thailand

Bangkok, 16 October 2015 – More than 415,000 students were involved in an ozone protection oration contest for school children in Thailand. The initiative was organised by the Thai Government between August and October 2015 to raise public awareness of the importance of protecting the atmospheric ozone layer.

Children between the ages of 12 and 15 years from more than 20 schools throughout Thailand participated in the contest entitled “The Ozone Rally” on the theme, “How can your everyday life protect the ozone layer?”

Twelve finalists spoke on the topic at the final event, which was the highlight of Thailand’s National Ozone Day celebration on 16 October 2015. It was attended by more than 300 visitors and held at Bangkok’s most popular shopping mall, Siam Paragon.

The competition was organised by the Ozone Protection Section, Department of Industrial Works, Ministry of Industry, with the aim of raising public awareness about ozone protection through regional networks of youth and academics.

The Director-General, Department of Industrial Works, Mr. Pasu Loharjun opened the final competition which was followed by the prize-giving ceremony and a mini-concert. In addition to students and academics, large numbers of members of the public and the media also attended the event.



Speaking on the occasion, Ms. Piyanee Thangtongtawi, Director of Ozone Protection Section, and the lead organiser of the event, said the initiative had increased public awareness about the importance of the ozone layer in Thailand and urged other Thai government agencies and neighbouring countries to work with youth and students to raise public awareness of major environmental issues. “Children and youth are very effective when it comes to telling stories and making connections among themselves and their family. Providing them an opportunity to learn about the ozone layer and tell the stories among their connections will result in life-long and sustainable knowledge and awareness about the issue”, she added.

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

10. SEAP Ozone Officers Discuss Low-GWP Alternatives in Bangkok

Bangkok, 5-7 October 2015 – National Ozone Officers (NOOS) from 13 countries in Southeast Asia and the Pacific attended the *Thematic Meeting of the Southeast Asia and the Pacific (SEAP) Network of Ozone Officers* organized jointly by UNEP OzonAction Compliance Assistance Program (CAP) in the UNEP Regional Office for Asia and the Pacific (ROAP) and the Department of Industry Works (DIW), Royal Thai Government. The meeting was held at the United Nations Conference Centre in Bangkok, from 5-7 October 2015.

A total of 46 participants including government officials, technical and policy experts as well as implementing

agencies of the Montreal Protocol's Multilateral Fund and Ozone Secretariat, exchanged experiences on the recovery, recycling and reclamation of ozone-depleting substances (ODS) as well the safe adoption of flammable refrigerants, phase-out of HCFC in the foam sector and other related topics.

The SEAP countries aim to avoid the use of alternatives with higher global warming potential (GWP) when phasing out HCFCs and to be prepared for the mainly safety-related challenges associated with low-GWP alternatives such as hydrocarbon R290 and HFC-32. To support this objective, the meeting discussed how countries can prepare themselves for the safe adoption of low-GWP alternatives in the refrigeration and air-conditioning sector from the perspectives of government rules and regulations, the servicing sector infrastructure and customer education. A comprehensive action plan was agreed upon following the discussions which would be reprioritised by countries based on their national situations.

The meeting also discussed the role of the Association of Southeast Asian Nations (ASEAN) in strengthening regional cooperation, with participants agreeing on having a regional competition on good practices for refrigeration servicing technicians.

The event, organised as a follow-up to the first Network Meeting in South Korea earlier this year, was funded by the Multilateral Fund for the implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer.



The SEAP network comprises the 10 ASEAN Member States, namely Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam plus Timor-Leste as an observer to ASEAN and two developed countries: Australia and Sweden.

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

11. UNDP Supports the Phaseout of CFCs in the Manufacture of Pharmaceutical Metered Dose Inhalers in India

Eliminating consumption of CFCs used in Metered Dose Inhalers (MDI) manufacturing was one of the last challenges India faced in achieving 100% CFC phaseout by 1 January 2010. Even though CFC usage for MDIs was a small percentage of national CFC usage until 1999, it grew rapidly during 2000-2007 due to the increasing demand for inhalers by asthma and Chronic Obstructive Pulmonary Disease (COPD) patients.

India had a problem – how to eliminate this CFC use while at the same time ensuring continuous availability of cost-effective medication to asthma and COPD patients. At Government request, UNDP helped develop this 5-year project. The project was approved by the Executive Committee of the Multilateral Fund at its 56th Meeting in November 2008, with Italy providing bilateral assistance. UNEP was responsible for the awareness and capacity building components. Funding was provided to four beneficiary enterprises: Cadila Healthcare, CIPLA, Midas-Care Pharmaceuticals, and Sun Pharmaceutical Industries, to adopt CFC-free alternative formulations.

The implementation of this 5-year project started in 2009 and ended successfully in 2012, one year ahead of schedule. A performance- based payment implementation system was designed whereby the four enterprises received payments based on verification of specific performance milestones achieved. This innovative modality helped fast-track project implementation and increased buy-in and ownership of the conversion process by the beneficiary enterprises.

The project eliminated 703 ODP tons of CFCs and ensured a continuous and cost-effective supply of CFC-free medication not only to asthma patients in India but also to asthma patients in other countries served by Indian exports.

- Click [here](#) for more information about UNDP work on Montreal Protocol.



EUROPE AND CENTRAL ASIA

12. Bolds Steps in Business to Protect the Ozone Layer

‘Change’ is simple to do, but it is by no means easy. This is especially the case when the change involves a shift from a simple and economically-advantageous practice, to one that challenges accepted business practices, but has a broad and important impact on the environment.

The need to protect the Ozone Layer is a fundamental challenge that has been faced since the 1970s. Scientists around the globe have proven that without humans taking due care and re-evaluating their actions, they could very well cause a range of destructive impacts. For key stakeholders including companies within the food industry, changing traditional and lucrative practices to those that will protect the earth requires much more courage and responsibility.

In collaboration with the ‘Initial Implementation of Accelerated HCFC Phase-out in the CEIT Region’ project, operated by UNDP, the State Committee for Nature Protection of Uzbekistan and the Global Environmental Facility, several companies in Uzbekistan have made bold but rewarding decisions to actively reduce their use of Ozone Depleting Substances. Below we present two of their stories.

A change in approach

“Introducing new industrial practices involves investments of time and money, for training, buying new equipment, and changing approaches,” said Stranislav Valaboev, the Executive Director ‘AZN’ refrigerator company based in Tashkent, Uzbekistan. *“From 2013, at our own expense we stopped using ODS – HCFC 141b in our manufacturing processes, in accordance with the Montreal Protocol on Substances that Deplete the Ozone Layer.”*

ODS – HCFC 141b is a hydrochlorofluorocarbon used in the manufacturing of refrigerators and building insulation. When the chemicals enter the atmosphere they change the structure of the Ozone Layer, thinning the layer and causing additional UV rays to pass through the zone to the earth’s surface. These rays can increase levels of skin cancer and cataracts, while also damaging plants and reducing ocean plankton populations.

With support from the project, the ‘AZN’ company from 2013 stopped its use of ODS – HCFC 141b in the manufacturing of thermal insulation equipment, and since 2014 ozone-friendly technologies have been utilized in manufacturing processes. The company has also trained staff in the need to phase out Ozone Depleting Substances such as HCFC 22, along with the need to address climate change problems caused by global warming.

Switching the processes used in refrigerator manufacturing has not been easy for the company, but it has been necessary. The process has involved retrofitting the company’s factory, introducing new technology into existing infrastructure, and investing in a change of employee mentality towards the Ozone Layer. It’s been a long term investment, but one that is important for long-term change.

“We want to become further involved in the UNDP Uzbekistan project, as part of the demonstration component,” said representative of company Holod System, specified in production refrigeration equipment in Tashkent. *“We will transition to filling the refrigeration units of some models with the R 290 (propane) natural refrigerant, in order to entirely phase out the HFC refrigerants group in the future. It’s important that we set a good example.”*

Better supermarkets

As Uzbekistan’s largest supermarket chain, support from ‘KORZINKA.UZ’ has been crucial in limiting the use of HCFCs. The company’s plan to limit HCFC use is long-term, multifaceted and sustainable, and has overcome some limitations including a lack of qualified technicians, and problems faced in accessing necessary products and equipment in large enough quantities. Still the company is dedicated to establishing long-term change.



“KORZINKA.UZ is a bright example of HCFC reduction in the food retail business,” said specialist of the HVAC and refrigeration installation and maintenance department Kamoliddin Nastritdinov. *“We are carrying out a number of procedures aimed towards achieving HCFC output limitation measures, including regular leak tests, and recovering and recycling HCFC-containing systems for repair shutdown periods.”*

With UNDP’s support, in September representatives from the chain attended a training held in the city of Casale Monferrato in Italy, in order to make sure the obtained knowledge and skills can contribute to the work processes. Seminars on reducing HCFC impacts are to be conducted in the coming month, with an expected long-term impact of increasing the quality of services available to refrigeration service companies. It is expected that in the remainder of 2015 and in 2016, more than 800 refrigeration technicians nationwide will be involved in trainings organized by the project.

“As a major measure in limiting HCFC outputs, our company has quit buying equipment designed for HCFC, and has taken certain steps to retrofit HCFC-containing systems in the future. Also the company has a great interest in utilizing natural refrigerant-based equipment for blast freezing,” Mr. Nastritdinov said. *“We will need continued help from UNDP Uzbekistan in achieving this outcome.”*

Limiting HCFCs nationwide

Currently at midday through its timeframe, the ‘Initial Implementation of Accelerated HCFC Phase Out in the CEIT Region’ is halfway through its implementation, and a key component of a global initiative to reduce the production and use of ozone-depleting substances. It has sought to control HCFC imports, while ensuring equipment limiting the use of HCFCs are utilized.

The project intends to provide technicians of public and private refrigeration and air-conditioning companies with modern refrigeration equipment. With appropriate training, technicians can use the equipment to decrease fugitive emissions of ozone depleting substances. In 2016, five ODS recycling and regeneration centers will start their operations, supporting the improvement of national ODS re-use infrastructure in Uzbekistan, and decreasing the import of ODS.

► [UNDP](#), 28 October 2015, By International Blogging Consultant James Brindley, and HCFC project manager Abror Khodjaev

Invitation of Nominations for the ECA Ozone Protection Award for Europe & Central Asia 2016 (4th edition)

The Europe & Central Asia (ECA) network is inviting the customs & enforcement community to submit nominations for the 4th edition of the ECA Ozone Protection Award. It is a regional award for the ECA network & associated CEIT countries as well as their trade partners. The award ceremony is scheduled in Ashgabat, Turkmenistan in May 2016.

The nomination including a detailed description of the case, any evidence and photographs should be submitted to Halvart Koeppen, UNEP DTIE OzonAction Programme, Email: halvart.koppen@unep.org using the nomination form included in the [info note on the seizures and iPIC](#), as soon as the information is available but at the latest by 30 April 2016.

The ECA Ozone Protection Award for Customs & Enforcement Officers aims to provide incentive and recognition to customs and enforcement officers and their respective organizations, who successfully prevented illegal / unwanted trade of substances, equipment or products relevant for the implementation of the Montreal Protocol. It contributes to raising awareness about the Montreal Protocol and promotes cooperation between national customs services and ozone units.

► Contact: [Halvart Koeppen](#), Coordinator [Europe & Central Asia](#), UNEP OzonAction Compliance Assistance Programme



NORTH AMERICA

13. U.S. Government Working to Procure Environmentally Friendly Refrigerants



In a webinar hosted by the U.S. Environmental Protection Agency on 10 November, Bella Maranion from EPA presented federal sector leadership to reduce HFC emissions through procurement. Special focus was given to the ammonia/CO₂ cascade system at a Texas Air Force Base commissary.

Under the Significant New Alternatives Policy (SNAP) programme, the U.S. EPA works closely with government agencies, the military and standardisation organisations on the adoption of climate friendly refrigerant solutions. During the webinar, EPA Program Analyst Bella Maranion presented on-going actions of the federal government to procure environmentally friendly refrigerants.

Maranion raised concerns over the significant growth of HFC emissions, particularly in the refrigeration and air conditioning sectors. In 2010, federal agencies reported HFC emissions of nearly 2.2 million metric tons (MMT) CO₂eq. Currently HFCs count for 1.5 per cent of all greenhouse emissions but they are expected to triple by 2030.

In response to these alarming figures, in June 2013 President Obama presented his Climate Action Plan to address HFC emissions. The plan included measures to foster federal leadership in this field by mandating that cleaner alternatives to HFCs should be acquired whenever feasible and by transitioning to equipment using safe, more sustainable alternatives over time.

Maranion explained that the Climate Action Plan is “a very large incentive for manufacturers as the federal government is such a big customer.”

Indeed, the U.S. federal government is one of the biggest purchasers of goods and services, including air conditioning and refrigeration technology. Maranion stated that the government owns or leases more than 635.000 vehicles and more than 353.000 buildings. It also spends nearly \$191 billion each year on supplies and equipment, with \$222 million allocated solely to refrigeration and air conditioning.

There were two federal actions earlier this year addressing HFCs:

Executive Order (EO) 13693 of March 2015 (“Planning for Federal Sustainability in the Next Decade”), a very broad order that aims for the federal government to reduce direct greenhouse gas emission by at least 40% by 2025. Under this executive order, agencies are required to purchase sustainable products and services identified in EPA programmes, including alternatives to ozone depleting substances and high-GWP HFCs (where feasible, as identified by SNAP).

Second, the Federal Acquisition Regulation (FAR) proposed a rule in May 2015 that addressed HFCs by directing the government to procure alternatives to high-GWP HFCs. Under this rule, where feasible, substitute acceptable alternatives (as identified by SNAP) should be sought. The final rule is currently being drafted.

Moreover, the text of EPA’s 608 Proposal to improve the sale, handling, recovery, and recycling of refrigerants was finally published on 9 November. This rule aims to strengthen existing requirements on handling refrigerants and applies them to ODS and HFC refrigerants. EPA estimates that the rule alone will reduce HFC emissions by 7 MMTCO₂eq in 2025.

Maranion listed the U.S. Department of Defense (DoD), one of the oldest and largest government agencies, as an example of federal action. The DoD is currently taking different steps to ensure HFC emission reductions.

Moreover, at a White House event in October, the DoD declared its commitment to reduce high-GWP HFCs and seek low-GWP alternatives. Research and development funding for low-GWP refrigerants for military application has also been provided: up to \$3 million over a period of 3 years to fund competitively selected research and development projects.



WEST ASIA

14. United Arab Emirates Urges Unity to Find Fix for Ozone Layer

The UAE has called on all nations to work together to find and implement solutions to phase out substances that harm the ozone layer.

The country also reiterated its commitment to phasing out, by 2040, hydrochlorofluorocarbons (HCFCs) or chemicals that linger in the atmosphere for decades and damage the environment.

This message went out as the UAE hosted about 200 countries that have ratified the Montreal Protocol. Top ministers and United Nations representatives participated in a five-day meeting that ended on Wednesday.

"The time has come to work on accelerating the transition to search for innovative, sustainable, scalable solutions," said Rashid bin Fahad, Minister of Environment and Water, adding that delay in reaching an agreement on hydrofluorocarbons management would "undermine our efforts to mitigate climate change".

Recommendations reached by the international delegates will be presented at a top-level meeting in Paris in two weeks where a decision will be taken on the path to reducing use of substances that thin the ozone layer, including refrigerants such as HCFCs and chlorofluorocarbons, the latter which have already been banned in the UAE.



► [UAE Interact](#), 5 November 2015



FEATURED

OZONE SECRETARIAT

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



Logo for the 30th anniversary of the Vienna Convention

This year marks the 30th 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 conducted a smart digital campaign that entails 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 75th meeting of the Executive Committee, Montreal, Canada from 16 to 20 November 2015.

The 76th meeting is scheduled to take place in Montreal from 9 to 13 May 2016.

[Report of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol to the 27th Meeting of the Parties](#)

[▶ Learn more](#)

OZONACTION

UNEP, [OzonAction](#) highlights

NEW Publications Launched at the MOP-27

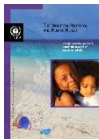


[NATIONAL CERTIFICATION SCHEMES FOR RAC SERVICING TECHNICIANS](#) - This publication aims to provide introductory information for institutions in developing countries to better understand the issue of certification in the field of refrigeration and air conditioning, to assist in the creation of such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



OZONACTION SPECIAL ISSUE 2015 - [30 Years of Healing Ozone Together: BEYOND HCFCs](#)

Other Recent Publications:



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](#)



[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](#)

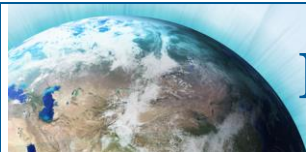


[Demonstrating the feasibility of R-290 based AC manufacturing: China's Midea and Meizhi case](#)



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

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EVENTS

2015



[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...

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2016



[Aqua-therm Prague](#), 1 - 4 March 2016, Prague, Czech Republic, 21st International Trade Fair for Heating, Ventilation, Air Conditioning, Measuring, Regulation, Sanitary and Environmental Technology



Call for speakers [AIRAH's Solar Heating and Cooling Workshop](#), 17 March 2016, Melbourne, Australia



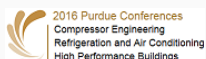
[12th Fumigants & Pheromones Conference](#), 6-9 March 2016, Adelaide, Australia



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



[ATMOsphere Europe 2016](#), 19 - 20 April 2016 at the Crowne Plaza Barcelona - Fira Center in Barcelona, Spain



Call for Papers [2016 Purdue Conferences](#) Refrigeration and Air Conditioning, Compressor Engineering, High Performance Buildings, 11-14 July 2016, West Lafayette, Indiana, USA



[12th 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



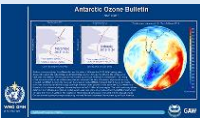
[Twenty Questions and Answers About the Ozone Layer](#), presents complex science in a straightforward manner. It complements the **[2014 Scientific Assessment Report of Ozone Depletion](#)** by WMO and the U.N. Environment Programme.



[Reducing global health risks through mitigation of short-lived climate pollutants](#)



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



[WMO Antarctic Ozone 2015 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.



INTERPOL Strategic Report - **[Environmental Crime and its Convergence with other Serious Crimes](#)**. Of particular interest are pages 4 and 5.



The **[EU F-Gas Regulation Handbook](#)**, a free online resource for climate media and other concerned parties, just 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. 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.



[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 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, 7th Ed. 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.

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 (CO₂), hydrocarbons (HCs), ammonia (NH₃), water (H₂O) 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



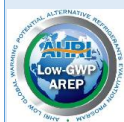


[New Theories and Predictions on the Ozone Hole and Climate Change](#)

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.



Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Low-GWP Alternative Refrigerants Evaluation Program (Low-GWP AREP) - TEST REPORT #44 [System Drop-in Tests of Refrigerant R-32 in Single Packaged Vertical Heat Pump \(SPVH\)](#)



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...



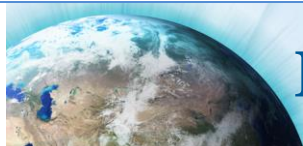
Latest issue of Centro Studi di Galileo magazine "[Industria & Formazione](#)" (n. 08/15 in Italian language).



[3rd Annual Energy festival 2015](#), Windhoek, Namibia



[Organic Bromine Compounds—another threat to the ozone layer](#)



MISCELLANEOUS

[Science & Policy of Climate Change](#), Nobel Prize recipient Mario Molina returns to UCI to talk about the history of climate change science ...

ARB releases [plan to slash short-lived climate pollutants](#) - Reductions of potent heat-trapping gases will deliver health and economic benefits ...



[CFC Practice Exam \(100 Questions\)](#) – A 100 Questions quiz produced to test knowledge of safe refrigerant handling and EPA regulations regarding the HVAC industry.



[Women shiver at work in 'sexist' air conditioning](#) - A new study has shown that air conditioning units are designed for the body temperature and metabolism of men and leave most women shivering...



MONTREAL PROTOCOL
WHO'S WHO

The Montreal Protocol Who's Who

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