

# OZONENEWS

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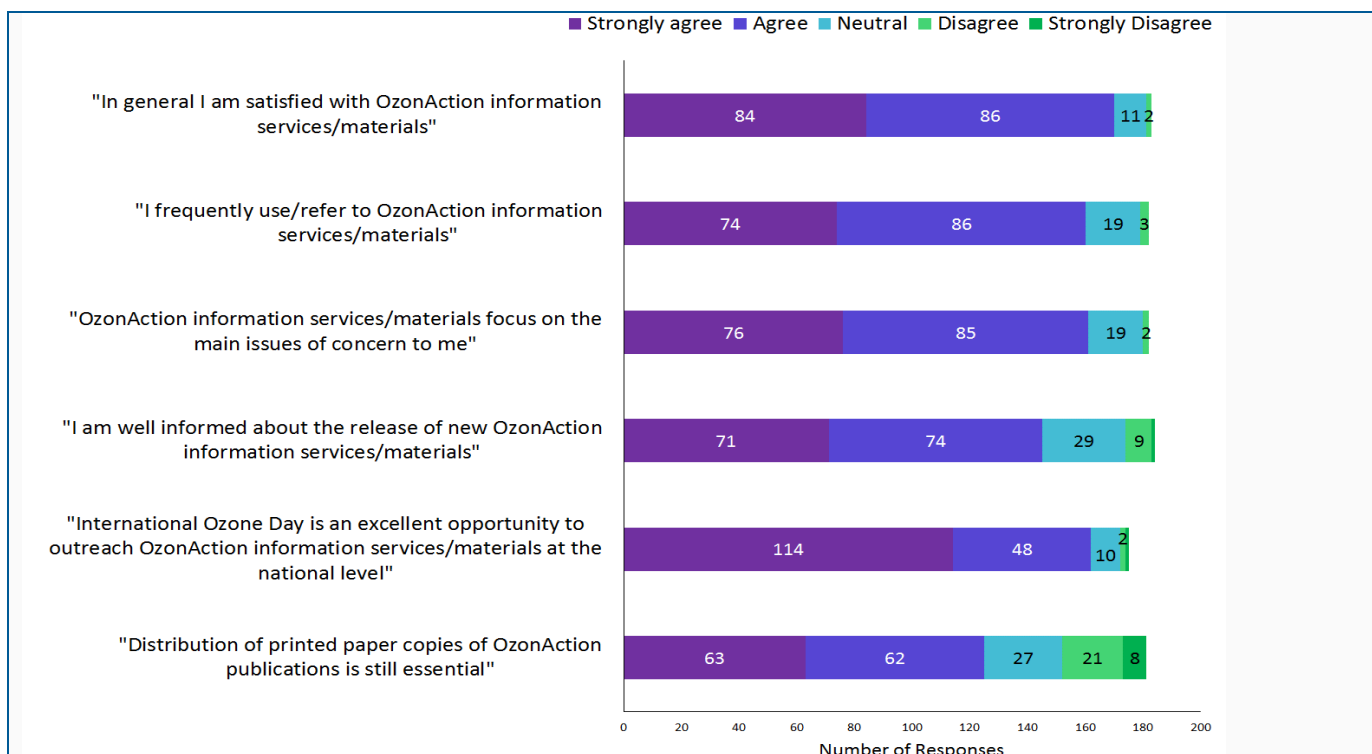
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A fortnightly electronic news update on ozone and climate protection and the implementation of the Montreal Protocol





More than 92% of respondents were satisfied or very satisfied with the information services/materials produced by OzonAction, with 86% indicating they frequently use or refer to these. Almost 88% of those surveyed responded that that the information services/materials produced focused on their main issues of concern. Of the 22 information service/materials individually identified in the survey to solicit specific feedback, 18 of these are considered by between 72% and 90% of respondents to be ‘useful’, ‘very useful’ or ‘essential’.

The most popular and most used information services/materials identified by the respondents to the survey were: OzonAction fact sheets; the Customs Training Manual; the customs poster/quick tool; the Safe Use of HCFC alternatives booklet; and the International Standards in RAC booklet.

The highest rated, preferred formats of information services/materials identified by the respondents to the survey were the following:

- Short guides, manuals and booklets
- Fact sheets and briefings
- Videos
- Electronic newsletter (OzoNews)

The survey revealed that the twice-monthly OzonAction electronic newsletter [OzoNews](#) which has now been running continuously since January 2000 has remained very popular.

▶ For more information contact [Ezra Clark](#), UN Environment, OzonAction

### 3. Vienna Convention and Montreal Protocol Meetings: A Primer

This primer is intended to provide participants, especially new delegates, attending the meetings of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer (the Vienna Convention), the Meetings of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (the Montreal Protocol) and meetings of the Open-ended Working Group of the Montreal Protocol, with the necessary information to understand the procedures of those bodies and to enable them to effectively participate in those meetings.

The primer will introduce participants to the various institutions involved in the meetings and guide them through the process of the meetings; from preparations, to an explanation of the way business is conducted and conclusions reached.

Since more activities take place under the Montreal Protocol than under the Vienna Convention, this primer focuses more on meetings concerning the Protocol.



The primer will be updated as and when there is a need to do so in the future.

There are plenty of other resources available on the Ozone Secretariat website<sup>1</sup>, including reports of the meetings, information material and publications. For additional information, participants may, in particular, wish to refer to the Montreal Protocol and the Vienna Convention Handbooks as well as the rules of procedure<sup>2</sup> for meetings

▶ [Read/Download](#)

▶ UN Environment, [Ozone Secretariat](#), May 2017

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

The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached agreement at their 28<sup>th</sup> Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs).

The UN Environment, OzonAction developed a video to find out from renowned international scientific, health, technical, financial and national experts about background and significance of this Kigali amendment.



The amendment presents many opportunities: improving the environment, refrigeration and air-conditioning systems and especially energy efficiency. It also presents new challenges.

It is absolutely critical now for industry, governmental bodies and civil society to work together to adopt greener technologies in each country of the world and fight global warming.

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

#### 5. WCO Steps Up Collaboration with UNEP on Global Warming



At the invitation of the United Nations Environmental Program (UNEP) Ozone Secretariat, the WCO Tariff and Trade Affairs Directorate delivered a presentation at the Headquarters of the Ozone Secretariat in Nairobi, Kenya, on 22 May 2017.

The WCO representative touched upon several issues of mutual concern to both the global Customs community and the Ozone Secretariat, in particular the creation of Harmonized System (HS) codes in order to control the phase down of hydrofluorocarbons (HFCs) which are not ozone-depleting but contain high global warming potential and therefore affect the climate. Following the adoption of the

Amendment to the Montreal Protocol, at the 28<sup>th</sup> Meeting of the Parties in Kigali, Rwanda, Parties would begin collecting data on production and consumption of those substances which they would be required to report to the Ozone Secretariat on an annual basis.

In this regard, the WCO representative emphasised the importance for the WCO to assist the Parties to the Montreal Protocol by designating individual HS codes for the agreed HFCs in order to facilitate the implementation of the Kigali Amendment to the Montreal Protocol, which was expected to enter into force on 1 January 2019.

In his closing remarks, Mr. Gilbert Bankobeza, Chief of Legal Affairs and Compliance at the Ozone Secretariat, recalled how WCO in the past had facilitated the amendments to the HS Nomenclature in respect of Ozone Depleting Substances (ODS) namely CFCs, HCFCs and other substances. The separate HS codes for ODS are instrumental in paving the way for prevention of illegal trade in those substances and their eventual phase out. He concluded by expressing the desire of the Ozone Secretariat to continue its cooperation with the WCO, which has been proven to be very fruitful in the past years.

▶ [World Customs Organization](#), 24 May 2017

## 6. The Ozone Awards 2017: Call for Nominations

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

The Ozone Awards will recognize the achievements of individuals, groups, and organizations that have demonstrated extraordinary commitment and contribution to the progress and achievements of the Montreal Protocol in the past 10 years. These individuals, groups and organizations also exemplify the power of cooperation on large and small scales to accomplish goals and produce tangible change.

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

### [Download the Call for Nominations](#)

#### HOW TO NOMINATE

##### Who is eligible?

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

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

##### How do I submit a nomination?

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

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

##### When are nominations due?

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

#### SELECTION PROCESS

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

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

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

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

#### KEY DATES

**8 May – 20 July 2017**

Nomination period: All nomination forms are to be submitted by 20 July.

**21 July – 16 October 2017**

Review and selection of award recipients.

23 November 2017

Ozone Awards ceremony at the Twenty-Ninth Meeting of the Parties in Montreal, Canada.

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

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



## ASIA PACIFIC

### 7. Ministry of Environment and UN Environment OzonAction Organises the First Ever “Ozone2Climate” Technology Roadshow Post Kigali in Agra, India

Agra, India, 23 May 2017 - The first ever “Ozone2Climate” Technology Roadshow post Kigali Amendment was organised by Ministry of Environment, Forest and Climate Change, Government of India and UN Environment OzonAction’s Compliance Assistance Programme in association with Refrigeration and Air-Conditioning Manufacturers Association

(RAMA), Indian Polyurethane Association (IPUA), Energy Efficiency Services Limited (EESL), GIZ and UNDP. The Technology Roadshow was organised for the first time as part of the annual network meeting for Ozone Officers of South Asia in Agra, India



UN Environment OzonAction technology roadshow was inaugurated by Mr. Ajay Narayan Jha, Secretary, Ministry of Environment, Forest and Climate Change in the presence of Mr. Manoj Kumar Singh, Joint Secretary, Dr. Dechen Tshering, Regional Director, UN Environment Asia Pacific Office, Mr. Eduardo Ganem, Chief Officer, Multilateral Fund Secretariat, Ms. Tina Birmbili, Executive Secretary, Ozone Secretariat, Dr. Shamila Nair-Bedouelle, Head of OzonAction, UN Environment, and Mr. Jaco Cilliers, Country Director, UNDP, India.

The “Ozone2Climate Technology Roadshow”, had 13 exhibitors that promoted ozone and climate-friendly alternative technologies to HCFCs and HFCs in the refrigeration and air-conditioning (RAC) sector. The Technology Roadshow showcased current refrigeration and air conditioning equipment designed to be more energy efficient, hence with a double benefit of saving money for consumers, and with a much lower impact on the environment. Over 200 refrigerant technicians, ozone officers, business representatives and government officials attended the Roadshow.

Delegates from 20 countries and industry visited the 2017 exhibition and this was the first time the Ozone2Climate Technology Roadshow was organised as a part of the annual network meeting globally. The National Ozone Officers (NOOs) from 13 South Asia network countries visited the Technology Roadshow and gained information on state of the art HCFC/HFC alternative technologies.

The Industry Roundtable was attended by leading ozone and climate global technology providers and industry representatives from Daikin, Godrej, Honeywell, Expanded Polymer Systems Private Limited, SRF Limited, Voltas Limited, Foam Specialties Private Ltd., Bluestar Ltd. and Birla Aircon.

Along with the Technology Roadshow, UN Environment also organised the annual network meeting for South Asia Ozone Officers from 23 to 26 May 2017. The meeting focused on current policy and technology updates on ozone and climate friendly alternatives to HCFCs and HFCs specifically post Kigali amendment, linking the



HCFC phase out to future HFC phase down, the implications of Kigali amendment for the network countries and challenges and opportunities from a policy and technology perspective.

Inaugurating the Roadshow, Mr. Ajay Narayan Jha, remarked: “The Ozone2Climate Technology Roadshow has been put together to showcase technologies which are based on non-Ozone Depleting Substances with low Global Warming Potential. This exhibition allows the participants of the meeting to have hands on feel on the technology option and their techno-economic viability. These are excellent initiatives and add lot of value to the meeting.” Speaking about the context of the Roadshow as part of the annual network meeting, he remarked: “Network meetings create an opportunity for the Ozone Officers not only to share knowledge and experiences in the implementation of ODS phase out activities in a sustainable manner, but also in meeting the various compliance obligations by the countries under the Montreal Protocol.”

Head of the United Nations Environment’s OzonAction, Dr. Shamila Nair-Bedouelle, highlighted UNEP’s Compliance Assistance Programme (CAP) which provides significant support to Article 5 countries with meeting and sustaining their obligations under the Protocol. “The national ozone officers’ network meetings are a flagship of the CAP and offer a forum for exchange of experience and knowledge transfer among national ozone officers,” she said. Organising O2C Technology Roadshow along with the network meeting represents an innovative approach by the South Asia network to bring the state of art technology to the policy makers, she said.

“The refrigeration and air conditioning sector has become a cornerstone of modern life providing the essential foundation for public health, food security, industrial processes and human comfort. National Ozone Officers play a critical role in advising their governments on designing national roadmaps for ozone and climate friendly technology choices.” said Dr Nair-Bedouelle.

- ▶ **Contact:** [Atul Bagai](#), Senior Regional Network Coordinator, UN Environment, OzonAction Compliance Assistance Programme, Regional Office for Asia and Pacific

## 8. World Heritage Witnesses the Ozone Resolve

Taj Khema, Agra, 24 May 2017 – The World Heritage site Taj Mahal witnessed the Himalayan resolve of the thirteen South Asia countries that were recognized and conferred the Montreal Protocol Recognition certificate last evening. The event was organized on the small hillock in Taj Khema overlooking the world famous UNESCO Heritage Site Taj Mahal. On the occasion of the 30<sup>th</sup> Anniversary of the Montreal Protocol on Substances that Deplete the Ozone Layer, the South Asian countries were conferred this award on the occasion for compliance to the ozone-depleting substances (ODS) phase-out targets for 1 January 2015 set under the 1987 Protocol. The award was presented by the Ministry of Environment, Forest and Climate Change along with the United Nations Environment Programme’s (UN Environment) OzonAction Programme, the World Bank, UNIDO, UNDP and GIZ during the Reception Ceremony of the four-day *Annual Network Meeting of South Asia Ozone Officers* from May 23 to 26, 2017.

“We congratulate the South Asia countries for this achievement because compliance is not an easy task for governments. To attain this, governments have to synchronize their policies and legislations on ODS with programs to assist affected sectors to ensure the smooth transition to alternative chemicals and technologies,” stated Mr. Ajay Narayan Jha, Secretary, Ministry of Environment and Forests.



“The countries deserve acknowledgment for their commitments to completely phase out their production and consumption of HCFCs, by 1 January 2030. The compliance of all South Asia countries has played a significant role in the success of the Montreal Protocol as the best example for multilateral cooperation to protect the environment,” said Ms. Shamila Nair-Bedouelle, Head of OzonAction Programme, UN Environment.

The South Asia network is very important to the international community of ozone protectors because it is home to the largest producers and consumers of ODS. China and India are the largest producers of HCFCs and HCFC based equipment globally.

“HCFCs are not just ODS but are also powerful greenhouse gases. Research has shown that because of the Montreal Protocol, the world had avoided 11 billion tonnes CO<sub>2</sub> equivalent per year of greenhouse gas emissions,” explained Ms. Miruza Mohammad, Director, Ozone Unit in Maldives, one of the recipients of the recognition along with Afghanistan, Bhutan, Bangladesh, China, India, Iran, DPR Korea, Republic of Korea, Mongolia, Nepal,

Pakistan and Sri Lanka .

The ceremony was organized on the occasion of the annual network meeting of the Ozone Officers from 23 to 26 May 2017, in Agra, India organized by UN Environment's OzonAction Programme in cooperation with the India's Ministry of Environment, Forest and Climate Change.



Ms. Dulamsuren Dashdorj, National Ozone Officer of Mongolia, proudly receives the Montreal Protocol *Certificate of Recognition*, on the occasion of the 30<sup>th</sup> Anniversary of the Montreal Protocol. The certificate was a marble plate with intricate inlay work representing the fine craft of the Heritage site Taj Mahal. Also in the photo are senior officers from Ministry of Environment, Forest and Climate Change and UN Environment.

► Contact: [Atul Bagai](#), Senior Regional Network Coordinator, UN Environment, OzonAction Compliance Assistance Programme, Regional Office for Asia and Pacific

## 9. Waste Air Conditioners Seized in Vietnam

Cat Lai port, Ho Chi Minh City, was the scene of the most recent waste air conditioner seizure

Authorities in Vietnam have intercepted illegal consignments of hundreds of used air conditioners in three separate incidents this month.

Police action taken under the Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes also resulted in a raid on a warehouse in Ho Chi Minh City, netting hundreds of used refrigerators and air conditioners amongst a hoard of waste electronic goods.



According to reports in Vietnam's [Customs News](#), over 300 sets of used air conditioners were seized at Cat Lai port, Ho Chi Minh City, last week in a consignment from Japan. Customs officers discovered 326 outdoor units and 319 indoor units of various brands amongst other prohibited waste goods.

On May 18, customs officers at the port of Cai Mep, Vung Tau, found hundreds of waste air conditioners upon opening an unclaimed shipment that had arrived in April. A day earlier the same officers had seized air conditioners and refrigerators in a separate shipment. Since the beginning of this year, Cai Mep port customs claims to have checked and seized 10 containers of illegally imported goods, used electronics and refrigeration product.

On April 25, police raided a warehouse in Ho Chi Minh City to find it full of around 500 waste refrigerators and air conditioners amongst other banned used household electrical goods. All had been illegally imported into Vietnam.

► [CoolingPost](#), 29 May 2017

► See also [Customs News](#)



## 10. New Zealand Consults on New HFC Phase-down Plan



The New Zealand government has launched a consultation on its proposed HFC phase-down plan. The plan is open for consultation until 23 June. It sets ambitious targets for New Zealand's HFC phase-down, some of which going beyond the country's Kigali obligations.

To help New Zealand to comply with the Kigali Amendment to the Montreal Protocol – which obliges the country to phase down HFCs by 10% compared to 2011-2013 levels by 2019 – the government has put forward new regulations. Some provisions in the proposed plan – which is open for consultation until 23 June – go beyond New Zealand's Kigali obligations.

“This plan proposes to progressively reduce HFC consumption by more than 80% over the next 20 years. Between 2019 and 2036, New Zealand will reduce the levels of HFC imports from around 1340 ktCO<sub>2</sub>eq to less than 260, meaning that New Zealand will meet its international commitments ahead of schedule,” said Environment Minister Dr. Nick Smith upon tabling the proposals on 13 May.

The government plans to ratify the Kigali Amendment by 2018 and implement the new plan by 1 January 2019. To incentivise the adoption of HFC alternatives, New Zealand has had an Emissions Trading Scheme in place since 2008. But that scheme alone will not be sufficient to meet the country's Kigali obligations – hence the new proposals.

The first part of the plan proposes an import licensing system and controls on recycled HFCs, exports of HFCs and manufacturing of HFCs. The second part looks at measures to support businesses with the phase-down.

### **Towards an import licensing system**

The New Zealand government is proposing to require importers of HFCs to hold import permits. The scheme would cover the substances listed in the Kigali amendment only.

Regarding the baseline and phase-down steps of imports of HFCs, the plan aims to start with a lower quantity of HFCs than is required to meet the Kigali obligations. The plan also proposes more frequent and regular decreases than what is required under the Montreal Protocol.

Permits would be allocated by the New Zealand Environmental Protection Agency, which would also be responsible for allocating the HFC quantities to applicants.

Permits will include conditions regarding reporting on volumes and uses.

### **Controls on HFC imports, exports and recycling**

Although New Zealand only exports a small amount of HFCs each year – generally 2 to 12 tonnes – the plan aims to put in place a permitting system for the importation of recycled HFCs.

The government proposes mirroring the export requirements in place for HCFCs to HFCs listed in the Kigali Amendment.

The system requires the export of bulk controlled ozone-depleting substances – either new or recycled – to take place under the authority of a permit issued by the EPA.

### **Support for alternative refrigerants**

The government aims to implement programmes supporting the transition to alternative refrigerants. By measures, New Zealand refers to both regulatory (law changes) and non-regulatory measures.

For example, a public education campaign to raise awareness of the phase-down, or free training courses for the workforce using HFCs, could be implemented.

New Zealand's new HFC phase-down plan is open for consultation. The consultation is open to industry, NGOs and consumers until 23 June.

▶ More details can be found in the consultation document available [online](#).

▶ [R744](#), 22 May 2017



## LATIN AMERICA AND CARIBBEAN

### 11. Grenada Ahead of Montreal Protocol Schedule

Senator Winston Garraway, Minister of State in the Prime Minister's Office with responsibility for Natural Disaster Management and Information, addressed the Annual Network Meeting for Ozone Officers of the English-speaking Caribbean and Haiti held in Grenada on 17 May 2017.

Garraway announced that Grenada is well ahead of its Montreal Protocol target in the phase-out of Ozone Depleting Substances (ODS) indicating that in the phase out of Chlorofluorocarbon (CFCs), Grenada was able to phase out this group of chemicals in 2006, 4 years ahead of the Montreal Protocol Schedule of 2010.

He further stated that in the phase-out of a new group of ODS with a much lower ozone depleting potential, Hydrofluorocarbons, Grenada is approximately 8 years ahead of the Montreal Protocol Schedule and that Grenada's current consumption level is where it is expected to be in the year 2025.

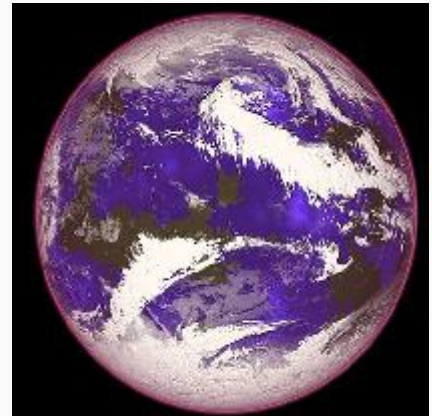
Garraway outlined activities undertaken by the National Ozone Unit (NOU) that has contributed to Grenada's successful path under the Montreal Protocol.

- Training of approximately 80% of refrigeration and air-conditioning technicians in Good Refrigeration Practices and alternative Ozone Friendly technologies;
- Training of Customs Officers, Trade Officials and the Bureau of Standards in Control and Monitoring of Trade in Ozone Depleting Substances;
- Establishment of a licencing and quota system to regulate the importation of ODS;
- Establishment of labelling standards for ODS containers and the safe use, handling and storage of ODS;
- Establishment of 20 recovery and recycling centres throughout Grenada for ODS management;
- Assistance provided in the upgrade of the curriculum at the T A Marryshow Community College (TAMCC) to an Associate Degree Programme;
- Establishment of a scholarship programme that has so far benefitted 33 students to undertake Certificate and Associate Degree programmes at TAMCC;
- Establishment and coordination of the Grenada Refrigeration, Air-condition and Ventilating Association;
- A robust public awareness and education campaign for the major stakeholders.

Grenada's role in the global effort to safeguard the fragile stratospheric ozone layer is exemplary and commendable. At the international level, Grenada continues to attract world recognition and respect for its performance in the global quest to heal the ozone layer.

Grenada and other parties to the Montreal Protocol are now preparing to ratify the Kigali Amendment to the Montreal Protocol agreed to at the 28<sup>th</sup> Meeting of the Parties in Kigali Rwanda in October 2016. The Kigali Amendment on Hydrofluorocarbons (HFCs) commits the world's nations to reduce consumption and production of HFCs by 2050 significantly.

▶ [NOW Grenada](#), 23 May 2017



## NORTH AMERICA



## 12. Adapting Today for the Future

Since 2007, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and UN Environment have been working under a cooperative agreement to support countries around the world to fulfil their obligations toward phasing out ozone-depleting substances and to comply with the control measures set by the Montreal Protocol and its amendments. ASHRAE is uniquely positioned to assist UN Environment in its important mission.

Founded in 1894, ASHRAE has more than 56,000 members residing in more than 130 countries. ASHRAE's sole objective is to advance technology related to the creation and control of building environments and the thermal conditions for industrial processes and refrigeration. The influence of ASHRAE among engineers, technicians and scientists around the world is further extended through ASHRAE's relationship with 62 global societies.

Within the current work plan agreed to by UN Environment and ASHRAE, several important initiatives are underway.

As a participant in the UN Environment Stakeholder Workshop to Streamline Training for the Refrigerant Service Sector, ASHRAE contributed technical expertise drawing upon the knowledge of its members in the safe handling of refrigerants. The need for the workshop results from the rapid pace of refrigerant technology development, which impacts the need for skill development in the servicing sector. There will always be locally driven qualification and certification, but training can be harmonised globally since the content is the same.

One of ASHRAE's most important contributions to the industry in general is American National Standards Institute ANSI/ ASHRAE Standard 34, Designation and Safety Classification of Refrigerants. This document, which is adopted and referenced worldwide, establishes a simple means of referring to common refrigerants rather than by their chemical name, formula or trade name. ASHRAE assigns numbers and safety classifications to the refrigerants based on toxicity and flammability data submitted by the refrigerant's producer. ASHRAE's companion standard, Standard 15, Safety Standard for Refrigeration Systems, sets forth requirements to help protect people and property where refrigeration facilities are located.

Being aware of Standards 34 and 15 is especially critical in light of new refrigerants being introduced into the market which have greater environmental benefit but which also have higher flammability characteristics. Besides Standards 34 and 15, there are numerous references to or adoptions of ASHRAE standards and other resources (such as ASHRAE Handbooks, ASHRAE guidelines and design guides) in national standards and the industry's practice manuals.

In April 2017, ASHRAE helped organise an international conference on Sustainable Management of Refrigeration Technologies in Marine and Off-shore Fisheries Sectors together with UN Environment, United Nations Industrial Development Organization (UNIDO), the International Institute of Refrigeration (IIR) and the Government of Thailand's Department of Industrial Works. The purpose of the conference was to address practices and future developments in the management of existing systems and trends towards longer term, energy-efficient, climate- and ozone-friendly alternatives in commercial on-board marine mobile refrigeration.

Another joint UN Environment and ASHRAE activity is the launch of a web-based interactive training portal. The first course available on the portal is aimed at meeting the needs of Article 5 (A5) countries. "Refrigerant Literacy" will be 4.5 hours in duration and intended for non-technicians (policymakers). Upon completion of this course, the student should be able to:

- Explain why the list of available refrigerants has changed;
- Characterise refrigerants according to ANSI/ASHRAE Standard 34;
- Determine the maximum refrigerant concentration in air, based on the refrigerant's toxicity level;
- Identify two standards that are important in the selection of refrigerants and in the servicing of refrigeration systems; and
- Identify safe handling procedures for the refrigeration servicing sector.

A second web-based interactive course of eight hours duration will be developed for technicians on refrigerant practices.

ASHRAE and UN Environment have developed a revised work plan focused on cooperative efforts from 2017 to 2018.





## EUROPE & CENTRAL ASIA

### 13. How Low will Ammonia Charges Go?

The ammonia charge in refrigeration systems could eventually reach as low as 18 grams per kilowatt, expert Pega Hrnjak told a recent conference in Ohrid.

With the development of innovative low-charge ammonia cooling systems heralding a renaissance of this natural refrigerant worldwide, charges could eventually reach as low as 18 grams per kilowatt (kW), leading expert Professor Hrnjak told participants in the [7<sup>th</sup> IIR Conference on Ammonia and CO<sub>2</sub> Refrigeration Technologies in Ohrid](#) last week.



The definition of low-charge ammonia emerged as a key topic of discussion during last week's conference of refrigeration experts in Ohrid, as the issue is open to different interpretations. Traditionally associated with high refrigerant charges, ammonia charges can in fact be reduced significantly, according to different case studies presented during the event.

In his keynote speech, Professor Pega Hrnjak from the University of Illinois at Urbana-Champaign, US, gave his account of recent work with ammonia and pointed to where future developments with ammonia are expected.

In his view, the key to promoting innovation with lower ammonia charges is "to clarify the maximum allowable with special precautions, the same as for R290, to provide incentives to reduce charge significantly".

#### **What should be considered low-charge ammonia?**

In the absence of an industry consensus, Professor Hrnjak suggested a definition based on three categories, namely:

- Ultra-low charge: Up to 2.5kg charge
- Very low charge: Up to 50kg charge
- Low charge: Up to 100kg charge

Rob Lamb, from Star Refrigeration, said another element suggested by the International Institute of Ammonia Refrigeration is to define low-charge ammonia as those systems containing "the lowest possible charge to ensure stable operation".

Based on case studies presented, Lamb concluded that, "it is possible to reduce ammonia charges to 95% compared to traditional systems, while ensuring stable operation".

For Professor Hrnjak, "it is possible to reduce the ammonia charge to 18 grams per kW of cooling capacity". This would make it possible to have only 1kg of refrigerant for a 20 kW refrigeration unit.

#### **Chillers, untapped potential for ammonia**

Reducing the refrigerant charge could hold the key for ammonia to expand to new applications. Centralised chillers for air conditioning are, in Professor Hrnjak's view, the application with the biggest potential. "We started working on NH<sub>3</sub> chillers with hermetic compressors 20 years ago".

By now, he believes the technology could be feasible and implemented in the market. "Ultra-low-charge ammonia chillers are an excellent environmental solution, which can operate safely and efficiently," he added.

"The market for chillers is huge compared to refrigeration. A total of US \$5bn market", Hrnjak explained. "Capturing part of a \$5bn market for chillers globally is a good reason to think about ultra-low-charge ammonia chillers," he concluded.

The [7<sup>th</sup> International Conference on CO<sub>2</sub> and Ammonia Refrigeration Technologies](#) took place in the Balkan

lakeside resort of Ohrid, Macedonia on 11-13 May, under the auspices of the International Institute of Refrigeration. A total of 150 participants attended the event, which combined keynote speeches from experts with technical presentations on work related to CO<sub>2</sub> and ammonia systems.

► [Ammonia21](#), 16 May 2017, By Alvaro de Oña

## 14. New GIZ-Guideline: How to Dismantle Refrigerators and Air Conditioners in an Environmentally-friendly Manner

The inadequate disposal of old, faulty air conditioners and refrigerators poses a considerable threat to the environment. In recognizing this issue, GIZ together with the Colombian partner ministry has published a guideline which illustrates how to appropriately dismantle cooling appliances. The publication addresses waste disposal companies and environmental ministries.

The refrigerants and insulation foams used in cooling appliances contain climate-damaging substances. If these substances escape during the dismantling of the appliance, the ozone layer is damaged, hereby leading to irreparable damage to the environment and human health. Nevertheless, many developing countries lack the necessary technology and knowledge to adequately dispose of faulty cooling appliances. Only valuable materials and components, e.g. the compressor, are removed from the cooling appliance, whilst the remaining components are discarded or burnt.

The new guideline outlines the step-wise procedures for a climate-neutral disposal of cooling appliances, including dismantling and transport considerations. Technicians from electronic waste companies are to be sensitized for a climate-friendly disposal while environmental ministries are encouraged to counteract climate change, protect the ozone layer and human health.

The new [publication](#) (Spanish) was released by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close cooperation with the Ministry of Environment, Housing and Territorial Development of the Republic of Colombia (MADS) and funded by the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety of Germany (BMUB).

► Contact: [Nicole Annette Mueller](#), Proklima - OE G330 Climate Change, Environment, Infrastructure, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH



## WEST ASIA

## 15. West Asia Ozone Officers Have Lively Montreal Protocol Discussions at Dead Sea

29 April 2017, Dead Sea, Jordan - The 2017 Meeting of the Regional Network of Ozone Officers of the West Asia region was organised by UN Environment's OzonAction initiative in cooperation with the Ministry of Environment of Jordan from 24-27 April 2017 on the shores of the Dead Sea. The meeting provided a platform for the countries to discuss their regional policy and technical priorities related to their ongoing national programmes to phase out hydrochlorofluorocarbons (HCFCs) under the Montreal Protocol on Substances that Deplete the Ozone Layer, and to have detailed discussions about the new forthcoming commitments to phase down hydrofluorocarbons (HFCs) under the Kigali Amendment, which was recently agreed by all Parties to the treaty in December 2016.



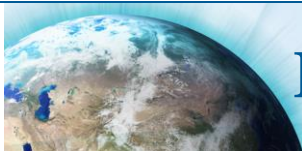
The Network meeting is part of an ongoing service of OzonAction's Compliance Assistance Programme (CAP) to support West Asian countries in implementing their Montreal Protocol commitments. The Network meeting was financially supported by the Protocol's Multilateral Fund.

Twenty-nine participants from the West Asian countries, the Multilateral Fund Secretariat, the Ozone Secretariat, the Multilateral Fund's Implementing Agencies (UNDP, UNIDO and World Bank) and the League of Arab States (LAS) joined the deliberations. The meeting agenda focused on the national and sub-regional policies and regulations that should be reviewed and updated to enable countries to implement their current and future obligations in addition to the technical and capacity building needs. The participants also discussed the Kigali Amendment and the procedures to be followed by countries to complete the ratification process. Other key topics discussed included the ongoing efforts to identify feasible long term alternatives suitable for all using sectors in the region's high ambient climate conditions mainly for the foam and air conditioning sectors.

"We are very happy to host the first post Kigali West Asia network meeting to discuss current and future policy and technical challenges that we face in the region and agree necessary recommendations that will shape the region's response" said Mr. Ghazi Odat, the National Ozone Officer of Jordan.

The meeting concluded with a number of recommendations that will address the pressing issues in West Asia in relation to the implementation of the planned activities to phase out HCFCs and prepare the region to deal with the upcoming era of the phase-down of hydrofluorocarbons (HFCs), which are controlled under the Kigali Amendment. Specifically, the network requested all of the Implementing Agencies to compile and share information on available and effective alternatives from projects that have been completed in West Asia and other regions, particularly for projects on pre-blended polyols and foam system houses. The participants recommended the organization of specialized technical and policy meetings and workshops to facilitate smooth and complete conversion of the foam sector, and they affirmed the need for continued support with identifying feasible alternatives for the refrigeration and air conditioning sector that are suitable for high ambient temperature countries. The meeting also discussed and endorsed the suggested work plan of the Compliance Assistance Programme.

- ▶ **Contact:** [Dr Abdulelah Al-Wadaee](#), West Asia Regional Network Coordinator, UN Environment, OzonAction Compliance Assistance Programme, West Asia Office, Bahrain



## FEATURED

### OZONE SECRETARIAT

- ▶ - [Twenty-Eighth Meeting of the Parties.](#)
- ▶ - [Resumed 38<sup>th</sup> meeting of the Open-ended Working Group.](#)
- ▶ - [57<sup>th</sup> meeting of the Implementation Committee.](#)
- ▶ Final text of the Kigali Amendment to the Montreal Protocol available in all the six official UN languages  
([ACEFRS](#))
- ▶ **OWWG 39:** The 39<sup>th</sup> Session of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer will be preceded by the 58<sup>th</sup> meeting of the Implementation Committee under the Non-Compliance Procedure for the Montreal Protocol, to be held on 9 July and a workshop on safety standards relevant to the use of low-GWP alternatives to HFCs, to be held on 10 July 2017.

Click [here](#) for further information.



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

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

### Caring for All Life Under the Sun

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



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

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

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

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

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

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

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

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

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

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

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

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

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

In accordance with Article 6 of the Montreal Protocol and subsequent decisions of the Parties, the three panels carry out a periodic assessment at least every 4 years. The first assessment reports were published in 1989 and since then major periodic assessments have been published by all three panels in 1991, 1994, 1998, 2002, 2006

and 2010. For each periodic assessment, the key findings of the panels are synthesized into a short report. The full SAP assessment report for 2014 was published in December 2014, while the EEAP assessment report for 2014 was published in January 2015.

#### PROGRESS & QUADRENNIAL ASSESSMENT REPORTS

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

[Assessment Panels List of Meetings](#)

#### SYNTHESIS REPORTS

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

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



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

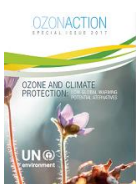
[Report of the 78<sup>th</sup> meeting of the Executive Committee](#)

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

[Learn more](#)

## OZONACTION

UN Environment, [OzonAction](#) highlights



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

### OzonAction Factsheets:



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



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



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



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

**Get the new RAC Technician Video App**

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

Available in English, French, Spanish, and German



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



**NEW!**

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

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

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



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



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



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



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



**Regional News Drops**

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

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

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

**OzonAction Recent Publications:**



**Lower-GWP Alternatives in Commercial and Transport Refrigeration: An expanded compilation of propane, CO<sub>2</sub>, ammonia and HFO case studies** - This booklet presents an expanded compilation of case studies on lower-GWP alternatives in commercial and transport refrigeration and provides an update to the first set of case studies which was published in 2014 by UNEP DTIE OzonAction/CCAC (Low GWP Alternatives in Commercial Refrigeration: Propane, CO<sub>2</sub> and HFO Case Studies).



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



**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](#)



**[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](#)

► [Learn more](#) about OzonAction publications



# EVENTS

2017



**ATMOsphere America 2017**, 5-7 June 2017, San Diego, USA. Interactive workshops bringing together decision makers from industry and government to change the future of natural refrigerants.



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



**9<sup>th</sup> International Conference on Compressors and Coolants**, 6-8 September 2017, Bratislava, Slovakia



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



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



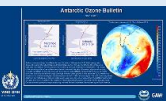
# READING



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



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



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



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



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



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



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



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



[Primer on Hydrofluorocarbons](#), Fast action under the Montreal Protocol can limit growth of HFCs, prevent up to 100 billion tonnes of 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



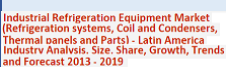
[Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems](#)-ASHRAE



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.



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

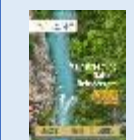


[Latin America Industrial Refrigeration Equipment Market Benefits from Region Flourishing Food and Beverage Production and Processing Market](#) – Trends and forecast 2013-2019.



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





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

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

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

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

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

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

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

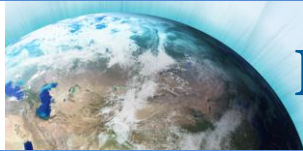
[Quest for climate-friendly refrigerants finds complicated choices](#), National Institute of Standards and Technology (NIST), 17 February 2017, Summary: Researchers have just completed a multiyear study to identify the 'best' candidates for future use as air conditioning refrigerants that will have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

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

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

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

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



# MISCELLANEOUS

## Announcement!

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



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

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

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

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

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

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

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



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

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



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



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

- Immediate and permanent access to the latest research and to IJR archive
- Access the latest articles as soon as they become available online.
- Browse, search and read each one of the nearly 4,500 papers since Volume 1, Issue 1.
- Unlimited access to seminal contributions to the field of refrigeration dating back to 1978.
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To access this new service, click "[activate my e-IJR subscription now](#)" and follow the instructions.



**International Observers - New AREA membership category** - Due to the significant worldwide interest in European legislative developments and the increase in competence of personnel who handle new refrigerants, AREA is pleased to introduce its brand new "International Observer" membership category. This provides a fantastic opportunity for non-European RACHP installer bodies the world, to

benefit from the expertise and discussions within Europe through access to AREA. Contact: [info@area-eur.be](mailto:info@area-eur.be)



### The Montreal Protocol Who's who

*See the latest nominations /*

Nominate Ozone Layer Protection Champion

From Your Country /Region >>

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

**Disclaimer:** The United Nations Environment (UNEP), Economy Division, OzonAction 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.



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**Prepared by:** Samira Korban-de Gobert, OzonAction

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

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