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In this issue

UNEP

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

Two New Publications Just Launched by OzonAction

Guide on Good Practices: Phasing out HCFCs in the Refrigeration and Air-conditioning Servicing Sector - The main purpose of this Guide on Good Practices: Phasing-out HCFCs in the Refrigeration and Air-conditioning Servicing Sector is to provide National Ozone Units and refrigeration and air-conditioning training institutes with a standardized module for delivering training programmes under HCFC Phase-out Management Plans. It can be used together with web-based slides and an interactive animated exercise. The publication can serve as a guide for other multilateral environmental agreements to also think globally and act locally.

Phasing out HCFCs in Small and Medium-sized Foam 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.

SPECIAL ANNOUNCEMENT!

Numerous seizures of ozone-depleting substances, mixtures and equipment have been reported in the past. One interesting example was the seizure of 1150 cylinders containing 13.6 kg of R-22 each (15,640 kg in total) in Vaalimaa, Finland, in 2011. The cylinders were hidden in a truck on its way to Russia and detected using an X-ray scanner. Finnish customs estimate the costs of destruction of the seized chemicals to be 54,000 Euros and would be interested in knowing how other countries have arranged for the disposal of similar seizures.

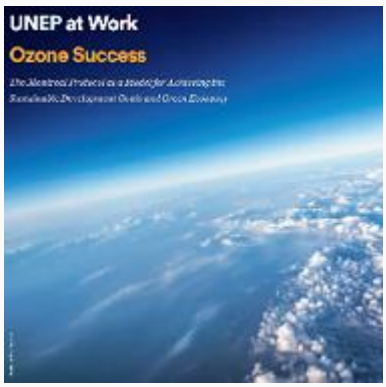
In case you are aware of similar cases, we would appreciate it if you could inform us how you dealt with similar seizures in your respective countries. Were they returned to the country of origin and how was the shipment monitored? Were they destroyed and if so who paid for it? Were they auctioned to eligible buyers and what was the procedure? Or are they still stored in customs warehouses and if so what are the costs? It would be useful to provide a short description of the seizure case and an explanation as to how the seized goods were disposed of.

We intend to compile this information and to share it widely with interested stakeholders. Many thanks in advance for your cooperation.

Contact: Halvart Koeppen, Regional Officer (Europe & Central Asia), UNEP DTIE OzonAction Compliance Assistance Programme, halvart.koppen@unep.org

GLOBAL

1. UNEP at Work, Ozone Success: The Montreal Protocol as a Model for Achieving the Sustainable Development Goals and Green Economy



The discovery of a hole in the ozone layer over Antarctica in the mid-1980s confirmed a tale of impending environmental disaster resulting directly from economic development. Thirty years later, with concerted global effort, the ozone layer is healing itself, and the strategy driving its recovery exemplifies how international partnerships can work together successfully towards a common goal.

The ozone success story is a model for united action that countries can learn from when implementing the post-2015 development agenda, to be rolled out in New York later this year. It is clear that this agenda will integrate social, environmental and economic factors in equal parts into measures of development.

These sectors cannot be considered in isolation without understanding their impacts on others. Development cannot be a zero-sum game, where benefits to one sector are made at the expense of another.

This premise is fundamental to the concept of Green Economy. In an era when around 1 billion people still live on less than US$1.25 a day, it is clear that conventional economic growth has not been the panacea hoped for by some.

Green Economy should generate growth whilst eliminating persistent poverty and environmental degradation, areas where conventional economic growth has failed. In response to the ozone crisis, the Montreal Protocol was, uniquely for an environmental treaty, universally ratified; it now has 197 parties. It brought together scientists, industry and government to work in an unprecedented partnership towards a common goal.

The success of this global partnership was made through the acceptance by governments of international scientific assessments, which then informed policy, both nationally and internationally. Leaders took decisions to eliminate the consumption and production of ozone-depleting substances because there was solid scientific

evidence linking human activities to ozone depletion—and linking that, in turn, to an increased incidence of skin cancer in people—as well as up-to-date information on the technological developments on alternatives to ozone-depleting substances.

Action was based on people's needs and concerns as well as on plausible future scenarios indicating the implications of inaction. As the host to the Montreal Protocol, and one of its four implementing partners, UNEP has been key in its execution.

More than US$3.7 billion has been contributed to the Multilateral Fund for the Implementation of the Montreal Protocol to cover the incremental costs incurred by developing countries in converting to non-ozone-depleting-substance technologies. The resulting changes in practices, and especially in developments in the chemical manufacturing industry, have altered global consumption and production patterns, greening global value chains.

Two million prevented cases of skin cancer per year by 2030 is one estimated social benefit of the Protocol's implementation; and in terms of environmental benefit, immeasurable damage to crops, forests and wildlife from ultraviolet radiation has been averted.

The behaviour of taking global action to achieve a development goal of universal benefit needs to be emulated in the sustainable development agenda. The Montreal Protocol resulted from a careful assessment of the social and environmental costs of continuing a course of action against its economic benefits, undertaken globally.

This is the exact premise behind the post-2015 development agenda. The ozone success story can be used as a model for common international action and global partnership, among all stakeholders, in taking on and committing to the work required to fulfil the sustainable development goals and develop a global green economy.

- Our Planet, March 2015 issue, UNEP

Our Planet: Time for Global Action - As we move towards the historic post-2015 summit at the 70th UN General Assembly next September, governments will be expected to adopt a transformational sustainable development agenda, including the finalization of the Sustainable Development Goals. This issue of Our Planet (March 2015) emphasizes the importance of an integrated and universal approach to the Sustainable Development Goals and the post-2015 agenda. The SDGs are based on three principles: 1) leaving no-one behind (in terms of poverty alleviation and development); 2) ensuring equity and dignity for all; 3) achieving prosperity within the Earth's safe and restored operating space. Our Planet also carries articles from leading authors on the post-2015 sustainable development agenda, as well as highlighting relevant work that UNEP has been carrying out in relation to the SDGs…

2. Upcoming Workshop on Hydrofluorocarbon Management: Technical Issues, Bangkok, 20-21 April 2015

A workshop on the management of hydrofluorocarbons (HFCs) is being convened in accordance with decision XXVI/9, adopted by the Twenty-Sixth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer in November 2014. In paragraph 2 of that decision, the Meeting of the Parties decided "to convene a two-day workshop, back to back with an additional three-day meeting of the Open-ended Working Group in 2015, to continue discussions on all issues in relation to hydrofluorocarbon management, including a focus on high-ambient temperature and safety requirements, as well as energy efficiency, taking into account the information requested in the present decision and other relevant information". In accordance with decision XXVI/9 issues related to HFC management will be discussed at the workshop and at the thirty-fifth meeting of the Open-ended Working Group. The workshop will take place on 20 and 21 April 2015 at the United Nations Conference Centre in Bangkok. The thirty-fifth meeting of the Open-ended Working Group will take place at the same venue from 22 to 24 April 2015.

The Secretariat has designed the agendas for the two meetings in such a way that the workshop will provide the opportunity for informed and in-depth discussions on all technical aspects of the management of HFCs and the meeting of the Open-ended Working Group will enable further discussions on all issues related to the management of HFCs.

The workshop will feature extensive participation by technical experts and industry representatives as overview speakers, panelists and participants with a view to providing clarification of technical issues and allowing for in-depth discussion at a practical level. The conclusions of the workshop will be presented for further consideration and discussion by the Parties during the meeting of the Open-ended Working Group.

- UNEP, Ozone Secretariat, March 2015

3. First Measurements of 4th Generation Coolants, Searching for Traces in the Atmosphere

4th generation halogenated coolants and foaming agents have only been in use for a few years. They have replaced persistent greenhouse gases such as R134a, which were used in (car) air conditioning units, refrigerators and in a variety of foams. Empa researchers

have now published first measurements on the atmospheric distribution and abundance of these new substances. They show that the new coolants are frequently used in Europe - and that their use is increasing.

The latest generation of halogenated coolants is a big step forward: these substances decay more quickly in the atmosphere hence their lifetimes are considerably shorter. That is why they do not add nearly as much to the greenhouse gas effect as their stable predecessors. These new substances, with names like HFC-1234yf, HFC-1234ze(E) and HCFC-1233zd(E), are now also more frequently used, as evidenced by the first measurements made by Empa at the Jungfraujoch and in Dübendorf. Since the start of the measurements in 2011, at the same time as the market launch of the new substances, the number of events in which these three substances could be traced has steadily increased. This indicates that a growing number of manufacturers are choosing to replace 3rd generation coolants with the new generation of coolants in their products.

The team led by Empa researcher Martin Vollmer is the first to analyse the traces of the latest generation of coolants in the atmosphere. «The first generation coolants arrived on the market in the 1930s. The process of taking measurements to trace these substances in the air began much delayed, 40 years later. The gap between market introduction and first measurements gets narrower with every generation, » said Vollmer.

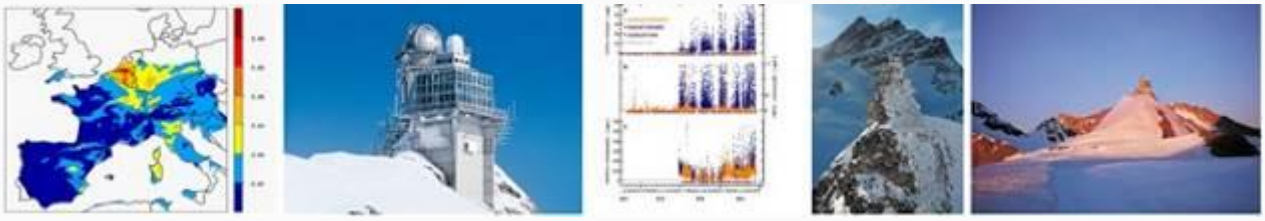
Measurements from Day 1

Researchers have been tracing the distribution of the latest refrigerants in the atmosphere since their introduction onto the market. What is interesting is that the substance HFC-1234yf did not appear at the start of the test series at the Jungfraujoch. It is evident that the substance is anthropogenic – it is man-made. «Zero values are nothing negative. Quite the contrary. This way, we could prove that the substances do not occur in nature. That is also an important finding, » explains Vollmer. It took two years until the concentrations of the new substances in the atmosphere were high enough to be detected at Jungfraujoch. Vollmer sees the investigations as a fully functioning early warning system. As soon as a new substance is on the market, researchers can monitor it and identify precisely when the substances appear in the atmosphere for the first time - and how long they persist. While, for example, the first generation of coolants remain in the atmosphere for decades (and even now traces of them can still be detected), the new coolants «survive» for only a few days or weeks before decaying in the atmosphere.

However, this degradation poses new problems for science. The coolant HFC-1234yf, for example, is not exactly unproblematic. Although it degrades faster in the air than its predecessor, it decomposes into a new harmful substance: trifluoroacetic acid, an extremely stable molecule that does not naturally degrade any further. It accumulates in water and living organisms, and it is also toxic for certain plants, especially certain types of algae. So in terms of the atmosphere the problem is solved, but now other kinds of ecosystems face new challenges – and so does research. It is increasingly important for researchers to consider not only the half-life of the new substances in the atmosphere, but also the effects of their decay products.

Molecules from all over the world

The measurements and models from Switzerland not only show whether and to what degree certain substances are present in the region, but also give indications on their source regions. In the case of the foaming agent HFC-1234ze(E), the «epicentre» of the emissions lies on the border between Belgium and the Netherlands. Empa's researchers identified this by combining their data with meteorological data on air movement.



Empa - Swiss Federal Laboratories for Materials Science & Technology, 24 March 2015

4. Earthquakes Can Cause Huge Halocarbons Release

Buildings destroyed by the 2011 Tohoku earthquake released thousands of tons of climate-warming and ozone-depleting chemicals into the atmosphere, according to a new study.

New research suggests that the thousands of buildings destroyed and damaged during the 9.0 magnitude earthquake and tsunami that struck Japan four years ago released 6,600 metric tons (7,275 U.S. tons) of gases stored in insulation, appliances and other equipment into the atmosphere.

Emissions of these chemicals, called halocarbons, increased by 21 percent to 91 percent over typical levels, according to the new study accepted for publication in Geophysical Research Letters, a journal of the American Geophysical Union.

First look

A building in Ishinomaki, on the Pacific Coast of Japan, damaged by the Tohoku earthquake in 2011. A new study shows that buildings destroyed by the earthquake released thousands of tons of climate-warming and ozone-depleting chemicals into the atmosphere. Credit: National Institute for Environmental Studies

The study is the first to look at how the Tohoku earthquake affected the release of halocarbons into the atmosphere and likely one of the first to examine emissions of these gases following a natural disaster, according to the study's authors.

"What we found is a new mechanism of halocarbon emissions coming from the earthquake," said Takuya Saito, a senior researcher at the National Institute for Environmental Studies in Tsukuba, Japan, and lead author of the new paper.

Halocarbons released as a result of the earthquake include chemicals that deplete the ozone layer and contribute to global warming – including some gases that are no longer used because of those harmful effects on the environment. These include chlorofluorocarbons like CFC-11, a powerful ozone-depleting chemical used in foam insulation until it was phased out in 1996, and hydrochlorofluorocarbons like HCFC-22, an ozone-depleting refrigerant that is also a powerful greenhouse gas and is in the process of being phased out of use. Among other halocarbons released by the earthquake were hydrofluorocarbons, or HFCs, and sulfur hexafluoride, both potent greenhouse gases.

The emissions of the six halocarbons released from Japan in 2011 are equivalent to the discharge of 1,300 metric tons (1,433 U.S. tons) of CFC-11 alone — equal to the amount of CFC-11s found in 2.9 million refrigerators manufactured before the chemical was banned. The total emissions of the six chemicals are also equivalent to the release of 19.2 million metric tons (21.2 million U.S. tons) of carbon dioxide into the atmosphere – an amount equal to about 10 percent of Japanese vehicle emissions in 2011, according to the study's authors.

Post-quake surprise

An air quality monitoring station on Cape Ochiishi, on the east side of Hokkaido Island in Japan. Ground-based air monitoring stations in the country recorded high levels of halocarbons following the Tohoku earthquake and tsunami in 2011. Credit: National Institute for Environmental Studies

Saito and his colleagues decided to investigate halocarbon emissions and their relationship to the earthquake after ground-based air monitoring stations in Japan recorded surprising high levels of these chemicals. The stations are on Hateruma Island, east of Taiwan; Cape Ochiishi, on the east side of Hokkaido; and Ryori, north of Tokyo on Honshu.

The study's authors combined these measurements with an atmospheric model and other mathematical methods to figure out that increased emissions from the earthquake were involved, how much of the emissions could be attributed to the disaster and how they compared to previous years.

They found that emissions of all six halocarbons were higher from March 2011 to February 2012, following the earthquake, than they were during the same time the year before the event and during the same period the year after it.

About 50 percent of the halocarbon emissions after the earthquake were of HCFC-22, likely due to damage to refrigerators and air conditioners. Emissions of the gas were 38 percent higher than the years before and after the earthquake. Emissions of CFC-11 were 72 percent higher than emissions before and after the earthquake, likely due to damage to insulation foams used in appliances and buildings, according to the study. Emissions of two types of HFCs — HFC-134a and HFC-32 — rose by 49 percent and 63 percent compared to the years before and after the disaster.

Impacts assessed

Debris from the 2011 Tohoku earthquake and tsunami. A new study is the first to look at how the earthquake affected the release of halocarbons into the atmosphere. Credit: National Institute for Environmental Studies

The new study also calculates the total impact of the increased emissions on ozone depletion and global warming. The earthquake-triggered surge of halocarbons increased ozone loss from Japanese emissions of those six gases by 38 percent* from March 2011 to February 2012 compared to the same time period in the years before and after the event. The amount of heat trapped in the atmosphere because of Japan's emissions of those six gases rose 36 percent from March 2011 to February 2012 compared to earlier and later years because of the extra emissions from the earthquake, according to the new study.

Saito said the new study shows the importance of including the release of gases from natural disasters in emissions estimates. Although the global effect of one event is small — emissions associated with the Tohoku earthquake accounted for 4 percent or less of global emissions in 2011 — the cumulative effect could be larger,

he said. Natural disasters accelerate the release of halocarbons and replacement of these gases could lead to the use of more halocarbons, according to the study.

National halocarbon emissions estimates by the Japanese government did not factor in the release of the chemicals due to the earthquake and are likely underestimating the amount of these substances in the atmosphere, according to Saito. Governments rely on inventories of chemicals and generic data about how they are used to estimate their amounts in the atmosphere – called a "bottom-up" approach" — whereas the new study uses actual measurements of the gases – called a "top-down" approach. "It is apparent that there are unreported emissions," Saito said.

The new study shows that there could be a need to include the amount of halocarbons released by catastrophic events in emissions estimates, said Steve Montzka, a research chemist at the National Oceanic and Atmospheric Administration in Boulder, Colorado, who was not involved in the research. It also highlights the need for more measurements of halocarbons in the atmosphere, he added, rather than relying on bottom-up emissions estimates from inventories.

"Atmospheric scientists often say that relying solely on bottom-up inventories to tell you how greenhouse gas emissions change is like going on a diet without weighing yourself," Montzka said.

*Note: This value has been corrected from the accepted manuscript posted online.

The American Geophysical Union (AGU), 26 March 2015

5. Flexible Colored PU Foams Market - Global Industry Analysis, Size and Forecast, 2015 to 2025

Polyurethane foam is a diverse and large segment of global polyurethane market. Polyurethanes are said to be a part of our day to day life. Foams play a significant role in commercial and industrial sector ranging from automotive to refrigeration. Based on the variants foams available in the market and increasing area of applications for flexible colored PU foams, the market is expected to experience growth in the near future. Foams are differentiated as flexible and rigid foams. The properties that rigid foam posses are hardness, resilience, compression properties, abrasion resistance, whereas flexible polyurethane foam posses properties such as dry heat resistant, water resistant, oxygen, ozone resistant and remain flexible at low temperature. Few critical characteristics for the use of polyurethane foam in the industrial sector are chemical resistant, oil and grease resistant, flame resistant, noise reduction and fungus, mildew, mould resistant.

The rigid polyurethane foams have outstanding thermal insulation properties, which makes its use as an insulator in commercial and domestic appliances such as hot water systems and refrigerators. The flexible polyurethane foam is extremely comfortable and finds wide range of applications in the furniture seating and automotive industry.

The factors that drive the flexible colored PU foams market include the growing demand from the automobile and construction industry coupled with the rising demand from the interior and furniture sector. The demand for colored PU foams in the packaging sectors is expected to rise in the near future. Furniture and interiors are expected to be the largest consumers of flexible colored PU foams as it is used in luxury couches, chairs mattresses and carpets on a large scale. However, the volatile raw material prices are expected to pose a challenge to the growing flexible colored PU foams market. In addition, environmental regulations are expected to hinder the market growth owing to issues related to use of diisocynate in the production process.

Liquid resin blends and isocyanates are expected to contain hazardous components that may lead to health hazards. Isocyanates are said to be skin and respiratory sensitizers. In addition, amines, glycols and phosphate that exist in the spray polyurethane foam also may hamper the health of humans to some extent. Certain regulatory and health safety information is made available in the U.S. through organization such as Polyurethane Manufacturers Association (PMA) and Centre for the Polyurethane Industry (CPI). Others information sources are the raw material manufacturers and polyurethanes systems.

The key segments included in the flexible colored PU foam industry include North America, Asia Pacific, Europe and Rest of the World (RoW). Due to high growth in the interior and furniture market, North America is expected to dominate the flexible colored PU foam market followed by Europe. Owing to the developments in the construction industry, Asia Pacific is expected to be the fastest growing market for flexible colored PU foam market. Owing to the benefits such as CFC free, HCFC free and non-Ozone Depleting Potential foams (non-ODP), a rising demand for bio based PU foams from North Africa and the Middle East is expected to open more opportunities for the flexible PU foams market.

Digital Journal, 23 March 2015

6. Ammonia's In The Air

Manufacturers and researchers always are looking for the next big thing. In the HVACR realm, something with the potential to be the next big thing is something that's actually been in use for more than a century: ammonia.

"With the current flux in the refrigeration industry, with refrigerants being phased out and new ones coming on, and with the uncertainty, ammonia is a refrigerant that's been around for well over 100 years in all sorts of applications," says Dan Dettmers, an associate researcher for the Industrial Refrigeration Consortium and the HVAC&R Center at the University of Wisconsin-Madison. "It's environmental and human risk factors are well understood, and it's a very efficient refrigerant," Dettmers says.

Dan Dettmers: ammonia is great as a built-up system or an isolated, packaged chiller, with a secondary refrigerant sent out to the cases.

According to the International Institute of Ammonia Refrigeration (IIAR), ammonia is a common, naturally-occurring compound in the environment and is among the most abundant gasses in the environment. Ammonia was first used as a refrigerant in the 1850s in France and was applied in the U.S. in the 1860s for artificial ice production. It later was used for block ice, food processing and other applications such as ice rinks in the 1920s. Today, ammonia refrigerant is used in supermarkets, warehouses, convenience stores, large commercial buildings, district chilled water loops and many other industrial-type applications.

The idea with critical charge is to get yourself down to as small a charge as possible and use secondary refrigerants as much as possible, keep the ammonia back in the engine room where you have ventilation, sprinkler systems, refrigerant detectors and safety systems in place." — Dan Dettmers

"This is the perfect area for application of this refrigerant," he said. "It's a good option provided it's managed properly."

Currently, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 15 (Safety Standard for Refrigeration Systems and Designation and Classification of Refrigerants) does not allow the use of ammonia in many typical commercial applications or residential units where there is only a single wall between the air and the ammonia itself, Dettmers said. In that case, a secondary refrigerant must be used.

"A wonderful way of applying it is as either a built-up system or a packaged chiller back in an isolated engine room with a secondary refrigerant being sent out to provide the cooling." he said. "Ammonia is allowed in industrial applications, and in that case we can send ammonia out across the roof down into an evaporator coil to provide cooling for the space or the equipment."

Safety Considerations

According to Dettmers, there's no such thing as a safe refrigerant, but ammonia carries a few extra risks: It's classified as E2L, so there is a slight flammability issue; there is a toxicity issue; and it smells.

"We refer to ammonia as self-alarming, meaning everyone has an ammonia detector on the front of their face," he said. "It's really easy to find a leak, but if you're not managing the system properly, ammonia can get out and especially in a commercial application can cause havoc to your business. You don't want to have to continuously evacuate your business because you have a small refrigerant leak."

The good news is that the leak rate for ammonia is the same as any other refrigerant.

It's really easy to find a leak, but if you're not managing the system properly, ammonia can get out and especially in a commercial application can cause havoc to your business. — Dan Dettmers

"It all depends on the maintenance practices and mechanical integrity practices of the facility," Dettmers said. "You need to maintain the equipment so it's in like-new operating condition as much as possible."

He added that training on the refrigerant is imperative, because a familiarity with halocarbon refrigerants doesn't necessarily mean someone is an expert on ammonia and the issues associated with it. Another safety and use issue users must be aware of is material compatibility; ammonia eats up copper.

Research Focus

According to Dettmers, there's been a large push to reduce the charge of ammonia systems down to the smallest amount of ammonia needed in the system, or the critical charge.

"The idea with critical charge is to get yourself down to as small a charge as possible and use secondary refrigerants as much as possible, keep the ammonia back in the engine room where you have ventilation, sprinkler systems, refrigerant detectors and safety systems in place," he said. "There's reduced chance of any

interaction between ammonia that might be escaping from the system and the general public, occupants of the building and those working there."

Those involved in the push are shooting for less than 10,000 pounds, which is the Occupational Safety and Health Administration's threshold for implementing a process safety management program, Dettmers said.

"Beyond that, it's just as low as you can go."

One of the ways that the charge is reduced is by keeping the ammonia entirely in the engine room and cooling off chilled water, glycol, or some other brine and sending that out to do the cooling.

"All of the ammonia is kept within the engine room," Dettmers said. "You don't need to use the ammonia to fill up all the piping from the engine room out to the evaporate and fill the evaporator. Fill up any vessels attached to the evaporator and bring it all the way back, so you use significantly less."

Another way to reduce the charge is through better controls and better equipment within the package itself.

"Using motor control valves or electronic expansion valves for DX systems instead of traditional thermal expansion can also help reduce the charge," Dettmers said. "Using better heat transfer surfaces, also, so a lot of people are working with microchannel heat exchangers, things like that, to get the charge down as small as possible to get the job done."

Another area of research and experimentation is ammonia CO_2 cascade systems, which uses ammonia as the high-temperature refrigeration system and carbon dioxide as the lower-temperature refrigeration system. Dettmers said the ammonia provides the heat rejection for the carbon dioxide refrigeration system and thus removes much of the need for ammonia to be sent out to the facility.

"The advantage of the ammonia CO_2 cascade system is it allows you to get to lower temps more efficiently than a traditional ammonia system," he said. "If you are freeze drying coffee or ice cream cakes and you need to get below minus 40 degrees, the ammonia CO_2 system will more efficiently get you down to those temperatures and reduce the charge of the ammonia within the system."

There are some disadvantages to current ammonia CO_2 cascade systems: There's now two different refrigerants to work with instead of one; there are two sets of compressors; the operator must be trained on both ammonia and carbon dioxide; and there's additional maintenance issues because of the extra equipment.

"Carbon dioxide has other issues, especially with defrost and higher pressures," Dettmers said. "It becomes a more complicated system. It's efficiency and ammonia charge reduction versus the complexities involved."

Packaged ammonia systems are a third focus of development for manufacturers.

"The packaged ammonia systems haven't caught up to the inherent efficiencies you find in the large halocarbon chiller systems because they've had more years and experience engineering those," Dettmers said. "Ammonia is really coming along in that area. I expect to see a lot of advances in the next few years."

ContractingBusiness, 6 March 2015, By: by Elaine Yetzer Simon Contracting Business

7. Hole in the Ozone Layer: VSLS Chemicals Could be to Blame for Ozone Depletion

The depletion of ozone layer is a phenomenon that threatens the very existence of this beautiful world and poses a great danger to future generations if concrete steps are not taken to keep it in hold. Ozone layer is a protective layer present in stratosphere that prevents the harmful layer of sun from reaching the earth.

When chlorofluorocarbons; CFCs and HCFCs reach the stratosphere, the ultraviolet radiations disintegrate them producing chlorine atoms that react with ozone, starting slow chain reactions ultimately leading to destruction of ozone. The reasons of ozone depletion are primarily man made activities. The presence of ozone depleting substances, several of which are present due to our own indiscriminate use of electric appliances, are a major setback to existence of an undamaged ozone layer.

Recent studies have concluded that chemicals not previously linked to depletion of ozone layer are growing to an alarming number endangering the existence of an intact ozone layer. These substances, called "Very short lived substances" (VSLS), are produced naturally and synthetically. Researchers had created a 3D model to gauge the effect of VSLS on ozone. The measurements of VSLS for the last twenty years were examined and a man-made chemical called dichloromethane was found to be on a dangerous level. This chemical is used in industrial processes and it can thwart the slow recovery the ozone layer has been making after the effects of increased usage of CFCs.

Scientists sure consider this chemical, which is not governed by the Montreal Protocol, a threat to ozone and

eventually human life. The researchers also separated VSLS produced by natural substances (such as sea weed) and those by man-made ones. The contribution by natural VSLS to the destruction of ozone is 90 percent but the man-made VSLS is also on rise and is expected to outrun the percentage of natural VSLS.

- The Science Times,12 March 2015, By: Taimoor ul IslamMar

ASIA PACIFIC

8. UNEP Organises "Ozone2Climate" Technology Roadshow and Industry Roundtable in Republic of Korea

Goyang City, 10-13 March 2015 - The 3rd "Ozone2Climate" Technology Roadshow and Industry Roundtable under the UNEP-USEPA grant partnership project was organised by UNEP OzonAction ROAP team in association with Korean Refrigeration and Air-Conditioning Industry Association (KRAIA). The Technology Roadshow was organised as a part of the 13th Heating, Air-conditioning, Refrigeration and Fluid Exhibition – Korea (HARFKO) held from 10 – 13 March 2015 in the Kintex Exhibition Center II, Goyang City, Republic of Korea (ROK). UNEP's Technology Roadshow was inaugurated by Mr. Eduardo Ganem, Chief Officer, Multilateral Fund Secretariat; Ms. Tina Birmpili, Executive Secretary, Ozone Secretariat; Ms. Shamila Nair-Bedoulle, Head of Branch, UNEP OzonAction; Mr. Hyukjoong Kwon, Acting President, KRAIA and Ms. Elisa Rim, Environmental Protection Specialist, United States Environment Protection Agency (USEPA). The "Ozone2Climate Technology Roadshow Zone", as a part of HARFKO 2015, had 20 exhibitors that promoted ozone and climate-friendly alternative technologies to HCFCs in the refrigeration and air-conditioning (RAC) sector. About 20,000 delegates visited the HARFKO 2015 exhibition and this was the first time the Ozone2Climate Technology Roadshow was organised as a part the biennial HVAC/R exhibition of KRAIA. The National Ozone Officers (NOOs) from 25 countries and National Procurement Officers from 17 countries of South Asia (SA) and South East Asia and Pacific (SEAP) also visited the Technology Roadshow and gained information on state of the art HCFC/HFC alternative technologies.

As a part of the Technology Roadshow and USEPA-UNEP grant partnership project, UNEP and KRAIA also organised the Ozone2Climate Industry Roundtable on 12 March 2015. The Roundtable focused on current policy and technology updates on ozone and climate friendly alternatives to HCFCs. The Industry Roundtable was attended by leading ozone and climate global technology providers and industry representatives. NOOs from 25 countries of the South Asia, South East Asia and the Pacific Island Countries network participated in the Industry Roundtable discussions. […] 220 participants attended the Industry Roundtable with 148 industry representatives.

- Contact: Atul Bagai, Regional Network Coordinator, UNEP OzonAction Compliance Assistance Programme, Regional Office for Asia and Pacific.
- UNEP DTIE OzonAction , March 2015

9. UNEP-USEPA Organise First Workshop on Promoting Public Procurement of Climate Friendly Alternatives to HFCs in Asia Pacific

In order to foster a dialogue between public procurers and ozone agencies in Asia Pacific, and to build their capacity to integrate alternatives to high- GWP HFCs into public procurement activities, USEPA and UNEP organised a one-day workshop in Goyang, Republic of Korea (13 March), back-to-back with the Ozone2Climate Technology Roadshow and Industry Roundtable and the Joint Thematic Meeting of the South Asia and South East Asia Ozone Officers networks. The workshop, the first of its kind, was organised by UNEP OzonAction in partnership with USEPA under the UNEP-USEPA grant partnership project. The objective of the workshop was to enhance the understanding of National Ozone and Procurement Officers of the Asia Pacific region on the opportunities of using government/public sector's substantial purchasing power as an effective policy instrument to promote ozone and climate friendly alternative technologies. National Ozone Officers from 25 countries and National Procurement Officers from 17 countries of Asia Pacific region attended the workshop. The workshop provided information to the Ozone and Procurement Officers on Montreal Protocol and Green Procurement programmes of the region and highlighted the best practices. The workshop had an interactive format with emphasis on group discussions of Ozone and Procurement Officers from the region. The workshop also facilitated institutional stakeholders' coordination between Ozone and Procurement Officers to work towards a common objective to encourage public procurement of zero-ODP and low-GWP alternatives to HFCs.

The workshop was supported by the European Commission, GIZ, Korea Environmental Industry and Technology Institute, UNEP Sustainable Consumption and Production (SCP) branch, USEPA, UNDP, UNIDO, World Bank and the Climate and Clean Air Coalition (CCAC). The workshop resulted in a series of recommendations to promote lower-GWP alternative technologies through public procurement. The participants agreed that such a workshop was critical to build and establish institutional networks to promote public procurement of alternatives to high-GWP HFCs in Asia and the Pacific Region.

- Contact: Atul Bagai, Regional Network Coordinator, UNEP OzonAction Compliance Assistance Programme, Regional Office for Asia and Pacific.
- UNEP DTIE OzonAction , March 2015

10. China Introduce Low-GWP Label for Room Air Conditioning and Heat Pump Water Heaters

On 13th March 2015, China launched a new low-GWP label for room air conditioning and heat pump water heaters to accelerate the development of natural refrigerant-based solutions in China. The Chinese Ministry of Environmental Protection along with UNEP, UNIDO, GIZ and CHEAA introduced the label to promote products using natural refrigerants. The criteria for the product is that it should be an energy saving product with zero ODP and less than 150 GWP.

- Hydrocarbons21, 23 March 2015, Original CHEAA article, Chinese language

EUROPE AND CENTRAL ASIA

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 of ECA network, UNEP OzonAction Compliance Assistance Programme

11. ATMOsphere Europe – Preparing for Widespread Natural Refrigerant Use in Light of F-Gas Regulation

ATMOpshere Europe returned to Brussels on 16 & 17 March 2015 for its 6th, and largest edition, attended by 230 participants. The event featured 60 international speakers, who presented on the very latest natural refrigerant trends in and around Europe. With new technologies to improve the efficiency of CO_2 in warm ambient climates, and increased investment in training, the market is already well prepared for the restricted use of HFCs foreseen by the new EU F-Gas Regulation.

Conference Chairman and shecco Managing Director, Marc Chasserot, voiced his confidence in the continued market growth in his welcome message: "Here in Europe we really are at the forefront of natural refrigerant technologies, we are leading the world. We see that policy has been a big driver of this, setting the framework, but playing an equally important role are the customers who want these technologies. We are seeing now more a more solutions, even for warmer climates, and using a variety of natural refrigerants."

EU F-Gas Regulations favours those that already work with natural refrigerants

In January 2015 the EU F-Gas Regulation entered into force, requiring a reduction in the average GWP of refrigerants from 2000 to 400 by 2030. As highlighted by representatives from the European Commission and individual Member States during the opening Policy Session, this sends a clear signal to the manufacturers and buyers of refrigeration and AC equipment to avoid the use of HFCs as much as possible.

Further strengthening the position of natural working fluids, the French Government plans to update regulations affecting ammonia installations, to allow for a wider introduction of NH_3 technology. The German Federal Environment Agency has published a hydrocarbon strategy identifying areas within the RAC sector where hydrocarbons could be used to a larger extent, such as household heat pumps.

The end of the "CO_2 equator" is in sight, but greater emphasis on training needed

Whilst in 2013 the need for cost-effective CO_2 transcritical refrigeration for warm climates was a hot topic of discussion, the technologies that could make this a reality were not yet tried and tested. Two years later, major retailers and system suppliers are busy installing economizers, ejectors, mechanical subcooling, adiabatic condensers and parallel compression, proving the efficiency of CO_2 transcritical in peak ambient temperatures. The message from ATMOsphere Europe 2015 was clear: one of the final hurdles to the widespread adoption of CO_2 commercial refrigeration is about to disappear.

"This is no longer a northern European thing, with growth in central and east European countries and the gradual lowering of the CO_2 equator," said Advansor's Torben Hansen.

One issue that still remains is training, with many of the presenters at ATMOsphere Europe emphasising the vital role that training will play in the phase down of HFCs. Although progress is being made, with major system suppliers such as Carrier and Epta highlighting their training programmes, a survey by AREA (the European Association of Air Conditioning and Refrigeration) revealed that in 2012 on average only 8 -12% of contractors were trained with low GWP refrigerant systems.

"A key fact in ensuring the continued success of CO_2 systems is industry expertise. From design, installation, commissioning through to service, it is essential that the knowledge exists to deliver and maintain these systems in the best possible way," said Stuart Webb, from Carrier during the Market Trends session.

Exclusive launch of hydrocarbon TripleAqua heat pump

Presentations on hydrocarbons (HCs) covered a wide variety of applications, from plug-in commercial refrigeration, ultra-low refrigeration systems, to heat pumps and water fountains. As with CO_2, the market demand for hydrocarbons is increasing, with Huayi Compressor Barcelona predicting a 42% increase in demand

in 2016 and Red Bull announcing 100% HC procurement in 2014 (except in Japan).

“We are forecasting a growth in propane solutions. At the beginning, when we started working with propane it was not accepted in all world regions, nowadays we can say it is a global refrigerant solution,” said Vicente Guilabert, Huayi Compressor Barcelona, S.L.

In an exclusive product launch Menno Van der Hoff presented the TripleAqua, a heat pump using hydrocarbon refrigerant propæne 433A (a mix of R290 propane and R1270 propene). With a refrigerant charge of less than 5kg, the TripleAqua’s unique design allows it to cool and heat two water supply pipes, individually or at once, enabling building managers to heat and cool different rooms as required.

Natural refrigerant heat pumps reduce energy costs across range of applications

Looking at the food-processing sector Mayekawa and Johnson Controls presented ammonia heat pump case studies that have enabled end users to reduce their energy costs by as much as half. For high temperature needs in the industrial market, a water vapour heat pump was discussed, a solution never presented before at ATMOsphere. Currently being tested by EDF, the water vapour heat pump has achieved promising results, including a COP of 5.4. SANDEN, Mitsubishi Heavy Industries, boostHEAT and ENEA, showcased different CO_2 heat pump solutions for residential and commercial heating.

- ATMOpshere, 23 March 2015:
- Presentations and pictures from ATMOsphere Europe 2015 are now available online:
  View presentations | View pictures

12. The Low-Down on Low GWP Refrigerants

The EU’s REAL Alternatives learning programme for engineers working with low GWP alternative refrigerants is now available to access. Officially launched last week, the programme has been developed by the UK’s Institute of Refrigeration and international partners to respond to the need for reliable, independent information on the safe, efficient and reliable application of low GWP refrigerants such as carbon dioxide, hydrocarbon, HFOs and ammonia.

REAL Alternatives is a European-wide learning programme designed to improve knowledge in the service and maintenance of these refrigerants in new systems.

The e-learning platform is currently available in English and Polish with Italian, German, Dutch and French to follow in the next few months. There are eight modules in the programme. Module 1 covering safety, efficiency, reliability and good practice is mandatory and must be completed before the other modules can be accessed. Module topics:

1. Introduction to Alternative Refrigerants – safety, efficiency, reliability and good practice
2. System design using alternative refrigerants
3. Containment and leak detection of alternative refrigerants
4. Maintenance and repair of alternative refrigerant systems
5. Retrofitting existing systems
6. Checklist of legal obligations when working with alternative refrigerants
7. Measuring the financial and environmental impact of leakage
8. Tools and guidance for conducting site surveys

- For more information and registration, visit the Real Learning website.
- Cooling Post, 22 March 2015

13. Bahamas Finding Innovative New Ways to Protect the Ozone Layer

The Bahamas has been pursuing Ocean Thermal Energy as an ozone friendly alternative when it comes to air conditioning and/or refrigeration, Minister of the Environment and Housing the Hon. Kenred Dorsett said.

The mega-resort of Baha Mar has sought out this technology as an alternative to reducing its electrical cost and refrigerant usage, Minister Dorsett explained.

Consequently, The Baha Mar Sea Water District Cooling (SDC) Project has been drafted, he said at the opening ceremony of the two-day Sub-Regional Meeting of the Ozone Officers of The English Speaking Caribbean and Haiti at SuperClubs Breezes, Wednesday, March 25, 2015.

"Subject to the compliance with all regulatory requirements of the various agencies, the Government of The Bahamas has agreed to the installation of an undersea pipeline that would run along the route extending from Prospect Ridge up to Goodman's Bay parking lot and enter the water toward Long Cay.

"The technology associated with this pipeline is designed for 9,800 tons of ocean water to meet 100 per cent of the air-conditioning load of Baha Mar. It is expected to displace Baha Mar's chiller load of 7 Megawatts and 59,000 barrels of oil/year."

Minister Dorsett said it has been proven that 50 per cent of a building's energy consumption is attributed to air conditioning and/or refrigeration.

"Therefore, it is imperative that Small Island Developing States such as The Bahamas develop innovative strategies to maximize energy efficiency.

"The Government of The Bahamas recently released a National Energy Policy to improve the energy sector for some 20 years.

He explained that one of the goals of the country is to be "a world leader in the development and implementation of sustainable energy opportunities, and continuously pursues a diverse range of well-researched and regulated, environmentally sensitive and sustainable energy programmes, built upon our geographical, climatic and traditional economic strengths." Minister Dorsett said for over 15 years, the European community has been utilising hydrocarbon technology in air-conditioning and refrigeration.

"Many have shunned this technology because hydrocarbons are flammable and this raises serious safety concerns. With good practices and safety protocols, the Europeans have had minimal incidences."

He said studies reveal that the benefits have outweighed the possible negative effects as the hydrocarbon technology is found to be more energy efficient, it has a lower global warming potential (GWP) and the technology cools better than conventional refrigerants.

"Some countries in the region such as Jamaica, St. Lucia, Grenada, and Belize have utilized hydrocarbon technology and have yielded energy savings of 20–40 per cent.

"In view of these positive results, the National Ozone Unit of the Department of Environmental Health Services has embarked on a pilot project to assess the viability of using this alternative gas."

Minister Dorsett said the project would involve the main building of the Department of Environmental Health Services headquarters and its Solid Waste Management Building.

The project seeks to:

- determine the peak performance of the present refrigerant with a calculated energy usage;
- retrofit the present equipment to contain the hydrocarbon technology;
- install a hydrocarbon monitor;
- determine the energy savings accrued over a specified period of time;
- generate a report of the Ministry of the Environment and Housing for presentation; and
- seek the Government's wishes as to whether it would like to implement such technology in other

Government Buildings.

The Sub-Regional Meeting of the Ozone Officers of The English Speaking Caribbean and Haiti is organised by the United Nations Environment Program in collaboration with The Bahamas Government.

The aim of the meeting is to strengthen the ability of National Ozone officers to implement the Montreal Protocol on Substances that Deplete the Ozone Layer in their respective countries.

The Montreal Protocol on Substances that Deplete the Ozone Layer was designed to reduce the production and consumption of ozone depleting substances in order to reduce their abundance in the atmosphere, and thereby protect the earth's fragile ozone Layer. The original Montreal Protocol was agreed on 16 September 1987 and entered into force on 1 January 1989.

Photo 1: Winner Ozone Layer Poster Competition - Chloe Stuart, grade nine student of Eight Mile Rock High School in Grand Bahama, created the winning poster among high school students to bring awareness of the need to protect the ozone layer. It was displayed at the opening ceremony of the two-day Sub-Regional Meeting of the Ozone Officers of The English Speaking Caribbean and Haiti at SuperClubs Breezes, March 25, 2015. *(BIS Photo/Kristaan Ingraham)*

Photo 2: Ozone Conference Opening Ceremony - Participants and guests attend the opening ceremony for the two-day Sub-Regional Meeting of the Ozone Officers of The English Speaking Caribbean and Haiti at SuperClubs Breezes, March 25, 2015. *(BIS Photo/Kristaan Ingraham)*

- Bahama Islands Info, 26 March 2015

NORTH AMERICA

14. EPA Responds to Incident that Leaves Four People Ill on St. John; EPA Working with U.S. Virgin Islands Government on Ongoing Investigation

The EPA is working closely with the U.S. Virgin Island government to investigate an incident reported to the U.S. Virgin Islands government and EPA on March 20, 2015. On March 20, 2015, paramedics responded to a call that four people in a family staying at the Sirenusa Condominium Resort in Cruz Bay, St. John became very ill. Family members were subsequently hospitalized.

The EPA is looking into whether the family was made ill by a pesticide called methyl bromide, which may have been used to fumigate a room at the resort on March 18, 2015. The use of methyl bromide in the U.S. is restricted due to its acute toxicity. Only certified applicators are allowed to use it in certain agricultural settings and is not authorized for use in dwellings. Health effects of acute exposure to methyl bromide are serious and include central nervous system and respiratory system damage.

"Pesticides can be very toxic and it is critically important that they be applied properly and used only as approved by EPA," said Judith A. Enck, EPA Regional Administrator. "Protecting people's health in the U.S. Virgin Islands is of paramount importance. The EPA is actively working to determine how this happened and will make sure steps are taken to prevent this from happening to others at these vacation apartments or elsewhere."

The EPA is continuing to work with the U.S. Virgin Islands government and others to gather information and will ensure that appropriate steps are taken if it determines any environmental regulations or laws were violated.

- US EPA, Press Release 23 March 2015, Contact: Mary Mears
- See also: Terminix Identified as Company in Sirenusa Chemical Poisoning

WEST ASIA

15. Recycling Centres to Be Set Up for ODS (Bahrain)

Bahrain will establish reclamation and recycling centres to process the Ozone Depleting Substances (ODS) at the end of 2015 or in the beginning of the next year, said Regional Network Coordinator United Nations Environment Programme (UNEP) Bahrain Dr. Abdulelah Alwadaee. He was speaking on the sidelines of the workshops conducted at Grand Ramee Hotel here on Wednesday.

Speaking to the *DT News*, he said that they would ensure that all the formal and informal workshops providing services to the air conditioning and refrigeration plants in Bahrain get the recovery machines so that the emission of the ODS to the outside world could be stopped.

"Recovery machines are essential for the technicians working in refrigeration and air conditioning plants to gather the harmful gases to be recycled later at the reclamation centres," said Alwadaee.

The ODS substances are very dangerous to the ozone layer on the earth's stratosphere at an altitude of about 10 km. Ozone layer absorbs most of the ultraviolet radiation reaching the earth from the sun.

The UNEP in collaboration with the Supreme Council for the Environment in Bahrain organised a series of meetings (March 22 – 26) on the total phase out of ODS, which will conclude today.

Regional Network Coordinator, AF/E Ozone Action Compliance Assistance Programme, DTIE Regional Office for Africa, Patrick Odala Salifu said that ozone is a global issue. According to him, by 2030 the total phase out of ODS will happen.

Industrial Development Officer, Montreal Protocol Unit, UNIDO, Dalibor Kysela said that [197] countries had ratified the Montreal Protocol and Vienna Convention so far, which is unprecedented as far as other protocols are concerned. He said that countries had different policies to tackle this issue, some are doing specific legislation.

"The meeting's objective is to ensure environment and ozone-friendly actions by the industries in West Asia region without damaging economic performance of the industries and social benefits they provide for the population at large," said Kysela.

Policy and Enforcement Advisor, UNEP/ROWA Bahrain, Khaled Klaly said that all the countries should establish and enforce sound certification systems for refrigeration and air conditioning equipment. "This would result in reducing the emissions of ODS that are being used as refrigerants in the equipment."

Programme Specialist Montreal Protocol Unit, UNDP Regional Hub, Istanbul, Maksin Surkov said that the essence of the meeting was to share the experiences of different countries and spread knowledge about the ozone layer. He said that the chemical detrimental to the ozone layer was being produced in Chinese factories and distributed to the whole world.

Ozone officer Yemen Faisal Bin Ali Gaber said: "If we have to keep our planet safe, we would have to protect the ozone layer."

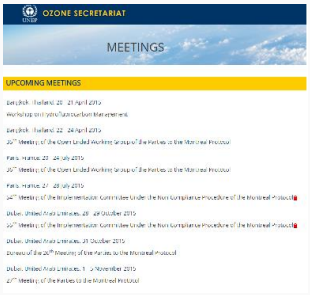
During the five-day meetings, experts from 22 governments and other regional and international specialized organizations will discuss the actions needed to be taken to overcome policy, technical and economic barriers, which may hinder the full compliance of developing countries with the targets established by the Montreal Protocol.

- dtnews, 26 March 2015
- See also: Experts to Discuss Ozone Depletion (Bahrain), dtnews Manama, 22 March 2015

FEATURED

OZONE SECRETARIAT

What's New Highlights: http://ozone.unep.org/en/



Advance version of the note by the Ozone Secretariat for the 35th meeting of the Open-ended Working Group (OEWG 35) of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, to be held in Bangkok, Thailand from 22 to 24 April 2015, has been uploaded on the meeting portal for the OEWG 35 and on the Highlights section of the Ozone Secretariat web site.

The note provides an overview of major issues related to HFCs and their management on the basis of available information and discussions held by the Parties to the Montreal Protocol to date. The Parties may wish to refer to it while deliberating on those issues during the OEWG 35 meeting.

The document can be accessed through the following links:

http://conf.montreal-protocol.org/meeting/oewg/oewg-35/presession/default.aspx

http://ozone.unep.org/en/in_focus.php?year=2015

- UNEP Ozone Secretariat, March 2015

- IMPCOM53: Report of the Implementation Committee under the Non Compliance Procedure for the Montreal Protocol on the work of its fifty-third meeting
- Report of the 10th meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer and the report of the 26th MOP - [A C E F R S]

Montreal Protocol Meetings Dates and Venues

- Workshop on Hydrofluorocarbon Management, Bangkok, Thailand, 20 - 21 April 2015
- 35th Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol, Bangkok, Thailand, 22 - 24 April 2015. Provisional agenda - Advance copy - UNEP/OzL.Pro.WG.1/35/1

- Methyl Bromide Technical Options Committee 2014 Assessment Report
- Medical Technical Options Committee 2014 Assessment Report

Progress & Quadrennial Assessment Reports:

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

Halon Technical Options Committee Reports:

- Halons Technical Options Committee 2014 Assessment Report (Volume 1)
- Halons Technical Options Committee 2014 Supplementary Report #1 - Civil Aviation (Volume 2)
- Halons Technical Options Committee 2014 Supplementary Report #2 - Global Halon 1211, 1301, and 2402 Banking (Volume 3)
- Technical Note #1- Revision 4 - Fire Protection Alternatives to Halon - 2014
- Technical Note #2 - Revision 2 - Halon Emission Reduction Strategies - 2014

- Technical Note #3 - Revision 2 - Explosion Protection - Halon Use and Alternatives - 2014
- Technical Note #4 - Recommend Practices for Recycling Halon and Halocarbon Alternatives - 2014
- Technical Note #5 - Halon Destruction - 2014

THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

- The Executive Committee of the Multilateral Fund 74th meeting is scheduled to take place in Montreal, Canada, 18 - 22 May 2015.
- The 73rd meeting of the Executive Committee of the Multilateral Fund took place 7 - 13 November 2014, Paris, France. The final report of the meeting containing the 75 decisions taken by the Committee is available as document UNEP/OzL.Pro/ ExCom/73/62 on the Multilateral Fund's web site.

The Executive Committee approved a total of US $68,784,379 including support costs for agencies for phase-out projects and activities in 62 Article 5 countries.

Learn more

OZONACTION

NEW Publications Just Launched

Guide on Good Practices: Phasing out HCFCs in the Refrigeration and Air-conditioning Servicing Sector -

Phasing out HCFCs in Small and Medium-sized Foam Enterprises

Publications/ Factsheets Launched During MOP-26:

Financing the Climate Co-benefits of the HCFC Phase-out

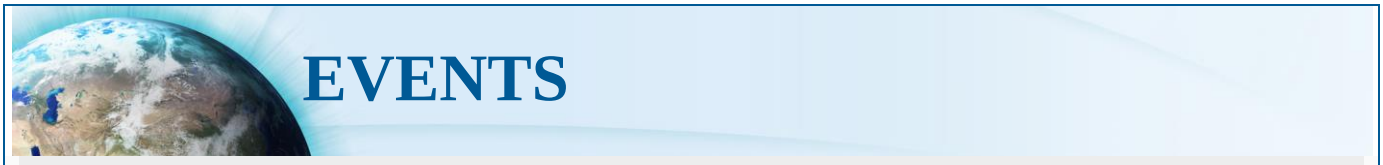
UNEP OzonAction CAP Achievements 2014

OzonAction Special Issue 2014: New Responsibilities under the HCFC Phase-out

Demonstrating the feasibility of R-290 based AC manufacturing: China's Midea and Meizhi case

Low-GWP Alternative for Small Rigid PU Foam Enterprises

Learn more about OzonAction publications and events throughout the MOP-26



EVENTS

2015

Tour de France des alternatives aux pesticides: Demandez le programme – 20-30 mars 2015, de Lille à Toulouse en passant par Poitiers, Beaune, Mouans Sartoux… le Tour de France des alternatives aux pesticides s'invite au programme de la 10ème Semaine pour les alternatives aux pesticides.

CLIMEXPO, 8 - 11 avril 2015, Tunis, Tunisie

International Conference IIR Commission B2 with B1 and D1 / Ammonia and CO_2 - Refrigeration Technologies, 16-18 April 2015, Ohrid, Republic of Macedonia. See more events from the IIR website

REHVA Annual Meeting and Conference 2015, 6-9 May 2015, Riga, Latvia, This event will bring together leading experts from the international heating, ventilation and air condition community.

Come and discuss **legislation and refrigerant options at F-Gas Question Time** -On Friday 22 May 2015, RAC will host its second Question Time devoted to the issues around the new F-Gas legislation, at the Royal Society of Chemistry in Piccadilly, London.

ASHRAE **International Conference on Ships**, 22-24 May 2015, Athens, Greece. During this event the United Nations Environment Program will present a special session with a range of topics and presenters that addresses the management of ozone-depleting substances in the fishing and shipping sectors.

The 6th International Conference on Heating, Ventilating and Air Conditioning, 26-28 May 2015, RIPI Conventions Center, Tehran, Iran

AIRAH's Refrigeration 2015 Conference will be held on Wednesday, 3 June, Sydney, Australia. The conference committee is now **calling for abstracts**, due on 19 March 2015.

FRIGAIR Africa 2015 is a go! 3-5 June 2015, Gallaghar Estate, Midrand. South Africa. FRIGAIR 2015 Showcasing the crucial role played by the HEVAC&R industry and the rapidly developing technology in eco-friendly efficiency.

16th European Conference The Latest Technology in Air Conditioning and Refrigeration Industry with Particular Reference to F-Gas Regulation Revision, New Refrigerants, New Regulations, New Plants. 12-13 June 2015, Milano, Italy

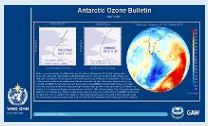
4th Annual ATMOsphere America 2015 – The Business Case for Natural Refrigerants in North America will take place on 25-26 June 2015, Atlanta, Georgia, USA

ASHRAE's 2015 Annual Conference will take place on 27 June – 1 July 2015, in Atlanta, Georgia, USA

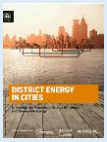
Advancing Ozone & Climate Protection Technologies: Food Cold Chain, 18 July 2015, Paris, France - The United Nations Environment Programme, the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants, the United States of America, and the Alliance for Responsible Atmospheric Policy are pleased to announce the Advancing Ozone & Climate Protection Technologies: Food Cold Chain to be held July 18, 2015, Paris, France.

The Future of HVAC Conference 2015 - Calls for abstracts – 18-19 August 2015, Melbourne, Australia

READING

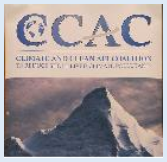


WMO Antarctic Ozone 2014 Bulletins - The World Meteorological Organization Secretariat issues bulletins containing information on the state of the ozone layer in the Antarctic at roughly two week intervals from August to November. The bulletins are based on data provided by WMO Members which operate ozone monitoring stations in the southern hemisphere and satellites to observe ozone globally.



District Energy in Cities: Unlocking the Potential of Energy Efficiency and Renewable Energy is among the first publication to provide concrete policy, finance and technology best practice guidance on addressing the heating and cooling sectors in cities through energy-efficiency improvements and the integration of renewable energy technology. …

Related video | UNEP Press Release



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

Low-GWP Alternatives in Commercial Refrigeration: Propane, CO_2 and HFO Case Studies The CCAC has launched a transformative initiative (entitled 'The HFC Initiative, Promoting HFC Alternative Technology and Standards') for rapid implementation aimed at promoting HFC alternative technologies and standards to significantly reduce the projected growth in the use and emissions of high-global warming potential (GWP) HFCs in coming decades relative to business-as-usual scenarios. The objectives of the initiative are to mobilise efforts of the private sector, civil society, international organisations, and governments…

Drawing down N_2O to protect climate and the ozone layer A UNEP synthesis report addressing the benefits of drawing down nitrous oxide (N2o) emissions. N2o is now the most significant ozone-depleting substance emission and the third most important greenhouse gas released into the atmosphere...

AREA Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants - AREA has updated its Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants. The revision includes an Annex II, which lists training facilities in AREA countries. The list provides website addresses and information on the type of training (theoretical and/or practical) by type of low GWP refrigerant.

Latest issue of Centro Studi Galileo magazine **Industria & Formazione** (n. 01/15).

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 …

Loopholes & ODS illegal trade threaten ozone layer recovery. EIA's latest briefing **New Trends in ODS Smuggling** highlights the growing threat of illegal trade in ozone depleting substances (ODS).

Primer on Hydrofluorocarbons, Fast action under the Montreal Protocol can limit growth of HFCs, prevent up to 100 billion tonnes of CO_2-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 Grabiel. 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. …

Global Automotive HVAC Market 2015-2019 - The analysts forecast the Global Automotive HVAC market to grow at a CAGR of 7.72 percent over the period 2014-2019.

Energy Efficiency Fact Sheet: Refrigeration - Refrigeration is of critical importance to many small businesses – from keeping simple kitchen facilities in commercial premises to equipment for the food service industry where needing to preserve perishable items or cool non-perishable products for sale is a day to day imperative. […] Whether making the most out of existing refrigeration solutions or implementing new energy efficient ones, energy can be saved through quick wins or longer term projects…

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

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Global Non-Melanoma Skin Cancer Market - Industry Size, Share, Segment Analysis and Forecast to 2020

Offshore Air Handling Units - Global Industry Analysis, Market Size, Share, Growth, Trends And Forecast 2014 - 2020

E-Bulletin MOPIA March 2015, Manitoba Ozone Protection Industry Association (MOPIA)

Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems- ASHRAE

Principles of Heating, Ventilating and Air-Conditioning, 7th Ed. ASHRAE

Advanced Energy Design Guide For Grocery Stores. ASHRAE

MISCELLANEOUS

The United Nations Environment Programme (UNEP) is inviting nominations for the **2015 Champions of the Earth** - the United Nations flagship environment award, which recognizes outstanding environmental visionaries and leaders and seeks to build momentum for the transition to a sustainable future. Learn more

Broadcast: GreenChill Webinar: **Experiences with Transcritical CO_2 Systems in the U.S.**

Date: Tuesday, April 14, 2015 **Time**: 2:00 pm to 3:00 pm (Eastern time)

The webinar will focus on experiences using transcritical CO_2 refrigeration systems in U.S. supermarkets. Harrison Horning (Hannaford) and Tristam Coffin (Whole Foods) will be discussing their companies' experiences using these advanced refrigeration systems in stores that opened in 2013. This webinar builds on a January 2014 GreenChill webinar on the same topic.

To join the webinar:

1. Go to https://epa.connectsolutions.com/transcritical_co2/

2. Select "Enter as a Guest". It is important that you select the option to enter as a guest.

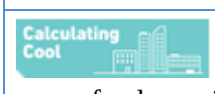
3. Enter your name. | 4. Click "Enter Room". | 5. Click "OK".

For audio:

1. Call the toll free call-in number: 1-866-299-3188 (706-758-1822 from outside the U.S.)

2. Use Conference Code: 202 343 9185#

Modernizing District Energy Systems Could Reduce Heating and Cooling Primary Energy Consumption by up to 50% finds New Report … Download the full report



AIRAH "**Calculating Cool Online HVAC Tool**" Imagine if there was a way of ranking different HVAC systems during design, installation and operation. And what if this method was freely available online and able to be used to drive improvement? Following the official launch of the Calculating Cool online benchmarking tool it's now possible for building owners and operators, HVAC industry professionals, facility managers and other stakeholders to measure the efficiency of a variety of HVAC systems.

Ammonia Refrigeration System Safety, Course April 13-15, 2015, Pyle Center, 702 Langdon Street, Madison, Wisconsin, Course Fee: $1095. By attending this course you will:

- Learn best practices for ammonia system safety and operation
- Understand relevant safety codes and standards
- Get answers to your specific questions
- Avoid operational risks with a solid understanding of safety in ammonia refrigeration
- Receive the latest updates on ammonia safety regulations

Une journée pour tout maîtriser. **Les fondamentaux du CO_2** : de la théorie aux cas pratiques. Savoir proposer une solution au CO_2… Paris le 10 avril, Lyon le 21 mai… Programme et Inscription

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