# OzoNews

**16 September 2014**

Vol. XIV

## 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

# GLOBAL

## 1. United Nations Secretary General, in Message for International Day, Lauds Montreal Protocol, Worldwide 'Decisive Action' to Preserve Ozone Layer

Following is UN Secretary-General Ban Ki-moon's message for the International Day for the Preservation of the Ozone Layer, to be observed on 16 September:

Just over a quarter century ago, the world united to reverse the rapid depletion of the atmospheric ozone layer, which protects Earth from harmful radiation from space. Today, the ozone layer is well on track to recovery within the next few decades.

The Montreal Protocol on Substances that Deplete the Ozone Layer is widely recognized as one of the most successful environmental treaties in history. It establishes legally binding controls on the national production and consumption of ozone-depleting substances, and enjoys universal ratification by 197 parties.

Recent scientific findings reveal the importance of the Montreal Protocol. Without the Protocol and associated agreements, atmospheric levels of ozone-depleting substances could have increased ten-fold by 2050. Concerted action has prevented millions of cases of skin cancer.

The Protocol has also significantly contributed to the fight against climate change, as many ozone-depleting substances are powerful greenhouse gases. Climate change is affecting communities, economies and ecosystems across the globe. It is essential that we act to mitigate the threat with the same unity of purpose as we have in facing the dangers of ozone depletion.

Let us take inspiration from our efforts to preserve the ozone layer. The Montreal Protocol has shown that decisive action by the international community, including the private sector, can achieve transformative results for the common good. Let us learn from this example and apply its lesson to the urgent task of addressing the climate challenge.

- United Nations Secretary General Message, Department of Public Information, News and Media Division, New York - A | C | E | F | R | S

The **Resolution** adopted by the General Assembly Forty-ninth session proclaiming 16 September the International Day for the Preservation of the Ozone Layer, commemorating the date in 1987 on which the Montreal Protocol on Substances that Deplete the Ozone Layer was signed, to be observed beginning in 1995…

## 2. The "Assessment for Decision-Makers" a Summary Document of the Scientific Assessment of Ozone Depletion 2014

United Nations Under-Secretary-General and Executive Director, United Nations Environment Programme Achim Steiner launched the "**Assessment for Decision-Makers**", a summary document of the Scientific Assessment of Ozone Depletion 2014, on 10 September 2014, at the UN headquarters in New York.

The "Assessment for Decision-Makers" is the work of a United Nations panel of 300 scientists and is the first comprehensive update in four years.

The report analyses the impact on the Earth's protective ozone layer of concerted international action since the adoption of the Montreal Protocol in 1987. It also assesses the implications of the phase-out of ozone-depleting substances on efforts to address climate change.

Mr Steiner together with the two Co-Chairs of the Scientific Assessment Panel of the Montreal Protocol, Dr. Paul Newman of the NASA Goddard Space Flight Center and Prof. A.R. (Ravi) Ravishankara of

Colorado State University, launched the report at a press conference also on behalf of Michel Jarraud, Secretary-General of the World Meteorological Organization.

- Press Release: Nairobi/Geneva, 10 September 2014 (UNEP/WMO) -Ozone Layer on Track to Recovery: Success Story Should Encourage Action on Climate (A C E F R S)

## 3. 2014 International Day for the Preservation of the Ozone Layer


# "Ozone Layer Protection: The Mission Goes On"

The Ozone Secretariat invited all Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer to celebrate the 2014 International Day for the Preservation of the Ozone Layer on 16 September, the day that was proclaimed as such by the resolution adopted by the United Nations General Assembly in 1994.

The theme for this year's celebration is "Ozone Layer Protection: The Mission Goes On". The Montreal Protocol has so far been successful in meeting some of its targets on phasing out ozone-depleting substances. As a result, the abundance of ozone-depleting substances in the atmosphere is declining and the ozone layer is expected to recover around the middle of this century. There are, however, some remaining challenges to the phase-out of ozone-depleting substances.

This year's theme seeks to galvanize all stakeholders to increase their efforts to address the challenges. It was selected following an online voting exercise.

The Ozone Secretariat has posted national plans submitted by parties, ideas for events and activities, and downloadable Ozone Day posters and banners for printing and wider dissemination available from the Secretariat's website

The Secretariat also plans to launch its new website on the International Ozone Day. As part of the Secretariat's overall brand evolution, the website is being redesigned to enhance its visual appeal and make information consumption easier. The new website will have a minimalist and cleaner look and feel, simpler navigation, and a responsive design that will offer a seamless experience across multiple devices.

The presentation of data reported by Parties has been enhanced using visualization and mapping tools for improved visual esthetics, usability and functionality across all devices. Users will be able to generate highly interactive and dynamic reports and charts that combine statistics and map data for better communication and engagement across all devices. The display of the handbooks of the Vienna Convention and the Montreal Protocol has also been improved for better delivery and comfortable reading.

- The UNEP Ozone Secretariat, September 2014

- Watch Ozone Day 2014 Videos
- Ideas for Events
- Social Media Pack
- Download Ozone Day 2014 Posters and Banners

## 4. « Continue Putting a Face » to Ozone Layer Protection!

[…] National Ozone Units and your cooperation with other countries through the Regional Networks of Ozone Officers, have played a crucial role towards the successful implementation of the Montreal Protocol. It is admirable to see how you have taken up the challenge of the HCFC phase-out management plan implementation. We highly commend you and your teams for these efforts! […]

[…] I urge you to raise the awareness of your activities and "put a face" to the ozone layer protection! […]

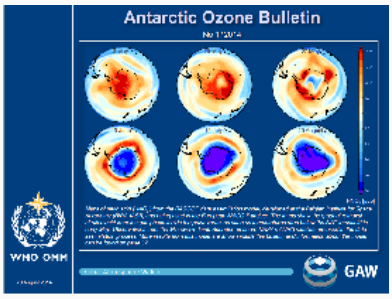
- Excerpt from the OzonAction Branch Head, Dr. Shamila Nair-Bedouelle Letter to the National Ozone Officers, 26 August 2014

- Browse through the OzonAction webpage dedicated to '**Country Activities**'!

  You will be amazed and inspired by the creativity of various events

  Worldwide Celebrating the 2014 **International Ozone Day**!


**OzonAction Branch Wish you Success for Your Country's Ozone Day Celebrations!**




## 5. Antarctic Ozone Bulletins no. 1 and 2, 2014 are now available from the WMO

**Executive Summary** #1- Stratospheric temperatures over Antarctica have been below the PSC type I threshold of 194.6 K since 9 May and below the PSC type II threshold of 187.8 K since 6 June. The daily minimum temperatures at the 50 hPa level were near the 1979-2013 average until mid June. From mid June until now the minimum temperature has been below the long term mean.

The average temperature at 50 hPa over the 60-90°S region has been close to the 1979-2013 mean during the whole period from March until now. At 10 hPa, the 60-90°S mean temperature was close to or somewhat below the long term mean until the end of May. From early June until early July it was well below the long-term mean. From mid July the mean temperature at 10 hPa increased noticeably and remained above the average until mid August after which it has been close to the long term average.

Since the onset of NAT temperatures on 9 May the NAT area was near or slightly above the 1979-2012 average until late July. From early August is dipped down for a couple of weeks before picking up again. From mid August until now it has been above the 1979-2013 average. The NAT area reached a peak of 26.04 million km2 on 20 August. During most of winter the NAT area has been close to or a bit below the NAT area seen in 2013 but larger than in 2012.

Since the onset of PSCs in early May until mid July, the NAT volume was close to and on some days above the 1979-2013 average. From mid July the NAT volume dropped below the long-term mean. The NAT volume in 2014 has followed the evolution of 2013 quite closely.

During May and June the 45-day mean of the heat flux was lower than or close to the 1979-2013 average. In July and August the heat flux has been noticeably larger than the long term mean. This is an indication of a relatively unstable vortex.

At the 46.4 hPa level (altitude of ~18.5-19.5 km) the vortex is now almost entirely depleted of hydrochloric acid (HCl), one of the reservoir gases that can be transformed to active chlorine. The area affected by HCl removal is similar in 2014 compared to recent years (2010-2013).

In the sunlit collar along the vortex edge there are regions with 1.5-1.6 ppbv of active chlorine (chlorine

monoxide, ClO), and ozone depletion has started.

Satellite observations show that the area where total ozone is less than 220 DU ("ozone hole area") has been significantly above zero since 6 August. The ozone hole area on 25 August is approx. 8.6 million km2, close to the long term average. The onset of ozone depletion varies considerably from one year to the next, depending on the position of the polar vortex and availability of daylight after the polar night.

Measurements with ground based instruments and with balloon sondes show first signs of ozone depletion at several sites, even as far south as 78°S. In this issue data are reported from the following stations: Belgrano, Davis, Dumont d'Urville, Macquarie Island, Marambio, Mirny, Neumayer, Novolazarevskaya, Rothera, Syowa, Ushuaia and Vernadsky.

As the sun returns to Antarctica after the polar night ozone destruction will speed up. It is still too early to give a definitive statement about the development of this year's ozone hole and the degree of ozone loss that will occur. This will, to a large extent, depend on the meteorological conditions. However, the temperature conditions and the extent of polar stratospheric clouds so far indicate that the degree of ozone loss in 2014 will be similar to that observed in 2013 and larger than in 2010 and 2012.

WMO and the scientific community will use ozone observations from the ground, from balloons and from satellites together with meteorological data to keep a close eye on the development during the coming weeks and months.

The Secretariat of the World Meteorological Organization issues bulletins containing information on the state of the ozone layer in Antarctica and surrounding regions 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. Meteorological data and model results are also used to assess and interpret the observations.

Read/Download:

- Antarctic Ozone Bulletin **no. 1**, 2014 | Antarctic Ozone Bulletin **no. 2**, 2014

The World Meteorological Organization, September 2014

Image Credit: Thinkstock.com

## 6. Ozone Layer is on the Mend, But There's Still Something Not Quite Right

High above Earth, more than 20 miles above sea level, a diaphanous layer of ozone surrounds our planet, absorbing energetic UV rays from the sun. It is, essentially, sunscreen for planet Earth. Without the ozone layer, we would be bathed in dangerous radiation on a daily basis, with side effects ranging from cataracts to cancer.

People were understandably alarmed, then, in the 1980s when scientists noticed that manmade chemicals in the atmosphere were destroying this layer. Governments quickly enacted an international treaty, called the Montreal Protocol, to ban ozone-destroying gases such as CFCs then found in aerosol cans and air conditioners. On September 16, 1987, the first 24 nations signed the treaty; 173 more have signed on in the years since.

Fast forward 27 years. Ozone-depleting chemicals have declined and the ozone hole appears to be on the mend. The United Nations has called the Montreal Protocol "the most successful treaty in UN history." Yet, despite Montreal's success, something is not … quite … right.

[ Watch the Video: ScienceCasts: Mystery In The Ozone Layer ]

A new study by NASA researchers shows that a key ozone-depleting compound named carbon tetrachloride ($CCl_4$) is surprisingly abundant in the ozone layer.

"We are not supposed to be seeing this at all," says NASA atmospheric scientist Qing Liang.

Between 2007 and 2012, countries around the world reported zero emissions of $CCl_4$, yet measurements by satellites, weather balloons, aircraft, and surface-based sensors tell a different story. A study led by Liang shows worldwide emissions of $CCl_4$ average 39 kilotons per year, approximately 30 percent of peak emissions prior to the international treaty going into effect.

In the 1980s, chlorofluorocarbons became well-known to the general public. As the ozone hole widened, "CFC" became a household word. Fewer people, however, have heard of $CCl_4$, once used in applications such as dry cleaning and fire-extinguishers.

"Nevertheless," says Liang, "CCl4 is a major ozone-depleting substance. It is the 3rd most important anthropogenic ozone-depleting compound behind CFC-11 and CFC-12."

Levels of CCl4 have been declining since the Montreal Protocol was signed, just not as rapidly as expected. With zero emissions, abundances should have dropped by 4% per year. Instead, the decline has been closer to 1% per year.

To investigate the discrepancy, Liang and colleagues took CCl4 data gathered by NOAA and NASA and plugged it into a NASA computer program, the 3-D GEOS Chemistry Climate Model. This sophisticated program takes into account the way CCl4 is broken apart by solar radiation in the stratosphere as well as how the compound can be absorbed and degraded by contact with soil and ocean waters. Model simulations pointed to an unidentified ongoing current source of CCl4.

"It is now apparent there are either unidentified industrial leakages, large emissions from contaminated sites, or unknown CCl4 sources," says Liang.

Another possibility is that the chemistry of CCl4 might not be fully understood. Tellingly, the model showed that CCl4 is lingering in the atmosphere 40% longer than previously thought. "Is there something about the physical CCl4 loss process that we don't understand?" she wonders.

It all adds up to a mystery in the ozone layer.

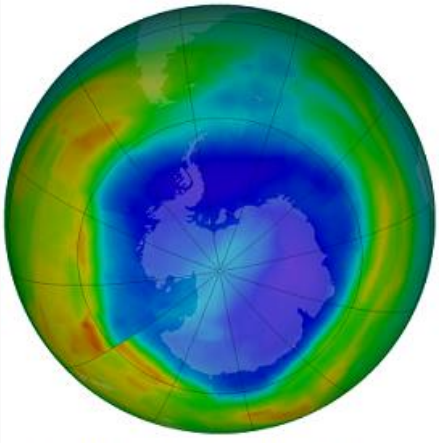
Liang's research was published online in the Aug. 18th issue of Geophysical Research Letters. More information about the extra CCl4 may be found there.

RedOrbit, 8 September 2014, Dr. Tony Phillips, Science@NASA

See also >>>

- SAGE III/ISS to Study Earth's Ozone Layer from the Space Station - NASA's Stratospheric Aerosol and Gas Experiment (SAGE III/ISS) will measure aerosols – tiny particles in the air – Earth's protective layer of ozone, and other trace gases. The space station's orbital inclination provides an ideal view for consistent ozone measurements…
- Un polluant interdit depuis vingt-cinq ans présent en quantité inexpliquée dans l'atmosphère, Le Monde.fr avec AFP, 21 Août 2014

## 7. After 30 Years of Protecting the Ozone Layer, Some Reasons to Be Cheerful



Ozone conditions as of September 7, 2014. NASA

It sometimes feels as if environmental news is never good news, but that certainly isn't true when it comes to the ozone layer. The UN has announced that the ozone layer is showing "signs of recovery". Evidence has pointed to recovery for some time, but researchers have waited until they were confident that the hole in the ozone layer was beginning to heal. It's not yet restored to perfect health – that will take a few more decades – but a significant corner has been turned.

That good news comes 30 years after governments around the world began to sign up to the Vienna Convention for the Protection of the Ozone Layer. Solving global environmental problems takes time, but the success of the Vienna convention, and the Montreal Protocol that puts the convention in to action, is proof that when the world works together, and keeps working together even when the going gets tough, it can deliver the solutions that we all need.

Of course, having written "that we all need" begs an important question. Why does the ozone hole matter to me? We have all seen those NASA images of the ozone hole over the Antarctic, but that's a long way from where most of the planet's population lives. It's a little like that scene at the end of "Happy Feet" where the politicians challenged to respond to the plight of the penguins ask why they should "worry about a load of flightless birds". So why should we worry whether or not there is a little more or less ozone, a tiny fraction of the gases in the atmosphere, than there might have been if we hadn't all changed our fridges and under-arm deodorants?

What's the ozone layer ever done for us?

The most obvious answer is that the ozone layer protects us from ultraviolet (UV) light, and that being exposed to too much UV can eventually cause skin cancers. OK, but just how many skin cancers have been prevented by protecting the ozone layer?

Until recently, it has been hard to answer that with any sort of numbers, but research has begun to model what the world would have been like if we had not protected the Earth's ozone layer. These "world avoided" models are indicating that without the Montreal Protocol people around the world would already be exposed to increases in UV. Those increases would be enough to be causing skin damage that, over time, would mean more people developing skin cancers.

In fact, the most recent estimate of what would have happened without ozone protection suggests that by 2030 there would have been around 2m more cases of skin cancer a year worldwide. That can't be a precise figure, but even if we take as a "ball-park" estimate, that's 2m people every year being saved from skin cancer because governments acted to protect the ozone layer.

Looking over a longer timescale, do the maths. Two million fewer skin cancers a year, year on year on year soon generates some very large numbers. And those figures don't take in to account the massive ozone depletion that would have occurred worldwide by the middle of this century. That collapse in global ozone is a consistent outcome of "world-avoided" research and would have increased UV levels around the world beyond anything that has ever been experienced since humans evolved.

Maybe we could have coped with that, but it would have been difficult. Yes, we can all reduce our exposure to UV by how we choose to behave, that's probably the biggest factor affecting our risk of skin cancer in the world we actually live in. But what about in the world avoided? How much sun-cream would you have needed if without protection you would begin to sunburn in just a few minutes? What clothes would you send your children to school in? Health-warning signs on the beaches? And even if you could cope, what about the damage to crops, to forests and to the oceans that would have resulted from run-away increases in UV, the scale of which we can't yet really quantify.

So yes, the news that the ozone layer is beginning to recover is a good reason to be cheerful. Be cheerful because we have protected the planet. Be cheerful because we have protected human health. Above all, perhaps, be cheerful because the success of the Vienna convention and the Montreal protocol shows that global governments can work together to solve major environmental problems.

When the Vienna convention was signed no one could be really sure exactly how ozone depletion might develop, but governments were brave enough to make tough decisions based on the best estimates of future risks. 30 years later, research allows us to confirm just how right those decisions were.

Surely that's good news not just for ozone, but also as we look ahead to the even tougher challenges of responding to climate change.

- The Conversation, 11 September 2014, By: Nigel Paul, Professor of Plant Science at Lancaster University

DISCLOSURE STATEMENT-Nigel Paul is co-chair of the United Nations Environment Programme (UNEP) panel on ozone depletion, but he writes here in his personal capacity. During the 1990s he received funding for research in to the effects of ozone depletion from UK research councils and the EU.

# ASIA PACIFIC

## 8. Pakistan Learns from China about HCFCs Alternatives

China, 15 August 2014: A delegation consisting of representatives from the Climate Change Division of the Government of Pakistan and Pakistan HVACR Importers & Traders Association, travelled to Beijing and cities in Guangdong Province to learn about HCFCs alternatives and phase-out approaches. The study tour was made possible with the generous help of the Foreign Economic Cooperation Office (FECO) within the Ministry of Environmental Protection (MEP) and was facilitated by UNEP China and UNEP OzonAction Compliance Assistance Programme (CAP) under the framework of South-South cooperation.

In Beijing the delegation met with FECO officials and learned about the strategies for HCFC phase-out in China. During the meeting with China Household Electrical Appliance Association (CHEAA), the representatives were introduced to standards of R-290 RAC installation, maintenance and transportation in China. The delegation was also welcomed by one of Chinese partners in HCFC phase-out, Wuzhou Foaming Ltd., which has successfully converted their production using $CO_2$.

In Guangdong province – a major manufacturing and trade hub in China, the delegation was received

warmly by Guangdong Meizhi Compressor Ltd. and MIDEA to witness their R-290 air-conditioner and compressor production lines. The tour culminated with a visit to a servicing and installation training center at Guangdong Xi'an Jiaotong University Academy.

This activity was designed to accelerate the national implementation of the HCFCs Phase-out Management Plan (HPMP) in Pakistan. Mr. Iftikhar-ul-Hassan Shah Gilani, Joint Secretary International Cooperation/ National Project Director (Ozone) who headed the delegation said "The arrangements made for the visit to different venues of manufacturing as well as servicing sector are really commendable. The delegation from Pakistan is thankful to UNEP for facilitating this visit. We are particularly grateful to FECO and UNEP office in China for their assistance provided and their efforts made in arranging the study tour which has provided opportunity to the Pakistan's delegation to learn on new emerging technologies and understand the phase out management of HCFCs." He further added, "Having good relations in trade and businesses, we hope that both countries will continue their support in technology conversion and share experiences in future. We also suggest that UNEP should continue such study tours in developing as well as in developed countries for sharing of ozone-friendly best practices in future".

Contact: Atul Bagai, Senior Regional Network Coordinator, OzonAction Compliance Assistance Programme (CAP), UNEP Regional Office for Asia and the Pacific

- UNEP OzonAction Branch, September 2014

## 9. Ozone-Depleting Fridge Gas New Favourite of Smugglers

*There has been a recent spurt in attempts to illegally ship R-22 gas, which is used in refrigerants and air-conditioners (ACs). (Photo: Gettyimages)*

The customs department has alerted its offices at ports about smuggling of ozone-depleting substances as there has been a recent spurt in attempts to illegally ship R-22 gas, which is used in refrigerants and air-conditioners (ACs).

In discussions with top officials last month, the Central Board of Excise and Customs (CBEC) flagged the gas along with gold, fake Indian currency notes, drugs and red sanders on which it will maintain a special focus this year as the department of revenue intelligence has spotted new ways of smuggling these items into the country, senior government officials told TOI.

While R-22 gas or chlorodifluoromethane is allowed to be imported, shipments are closely regulated and require a licence to be brought into the country.

But given the growing market for fridges and air-conditioners, the demand is higher than licensed supply. In certain countries, use of the gas will be banned by next year, while manufacturers were barred from using them in products launched after 2004.

In a note to chief commissioners, the CBEC has said that in several cases, R-22 gas cylinders were found to be concealed in consignments where the importer had declared shipments of furniture, kitchen cabinets, photocopiers and even fruits, said senior customs officers. The shipments were from China and Malaysia and the gas was sought to be smuggled through Mumbai, Chennai and Tuticorn ports. Although the officers said that front companies were being used to smuggle R-22, they did not have data related to the quantity of imports into the country. They, however, said that the scale was not as big as some of the other items, with cigarettes also put on the watch list.

Gold has retained its top slot on the Red Alert list for customs department given the government's decision to maintain 10% import duty as also other restrictions. During the last financial year, consignments worth close to Rs 700 crore were seized by customs and the Directorate of Revenue Intelligence, the note said. From concealing the precious metal in aircraft cavities, to putting them inside socks and knee caps and inside LCD television sets, smugglers have tried every trick to ship gold.

- The Times of India, 8 September 2014, By: Sidhartha & Surojit Gupta

## 10. SIDS Accelerated Modalities of Action

The outcome document of the just concluded conference on Small Island Developing States (SIDS) - an international forum which is not limited to SIDS - includes the following statement in the section "SIDS Accelerated Modalities of Action (SAMOA Pathway)":

"45. We recognize that the phasing out of ozone-depleting substances is resulting in a rapid increase in the

use and the release into the environment of hydrofluorocarbons with a high potential for global warming. We support the gradual phasing down of the consumption and production of hydrofluorocarbons."

This is yet another high level expression of support for climate mitigation action on these high-GWP gases, and it clearly makes the link between climate mitigation opportunities and the work being done under the Montreal Protocol to phase out ozone depleting chemicals. The language in the statement is similar to, and consistent with, that used in the Rio+20 "The Future We Want" outcome document on HFCs (para 222):

"222. We recognize that the phase-out of ozone depleting substances (ODS) is resulting in a rapid increase in the use and release of high global warming potential hydrofluorocarbons (HFCs) to the environment. We support a gradual phase-down in the consumption and production of HFCs"

- Outcome of the 3rd International Conference on Small Island Developing States, Apia, Samoa, 1-4 September 2014

# EUROPE AND CENTRAL ASIA


## 11. Are You Still Using HCFCs in Refrigeration and Air Conditioning Units? Action Required Now!

R22 (chlorodifluoromethane, also known as freon 22 gas or HCFC-22) is a refrigerant gas. It is widely found in air conditioning units and refrigerators. The emission of R22 into the atmosphere depletes the ozone layer and is regulated by the Montreal Protocol, which has prohibited the use of new HCFCs (including R22) in the maintenance or servicing of refrigeration, air conditioning and heat pump equipment since 2010.

However, it is currently permissible to use recycled HCFCs for the service or maintenance of existing refrigeration, air conditioning and heat pump equipment. This will not be the case after 31 December 2014. From 1 January 2015, the use of all HCFCs (new or recycled) for the service or maintenance of such equipment will be banned. If you continue to use recycled HCFCs after this date, you will be committing an offence and could be fined. There is no limit to the amount of fine that can be imposed.

A decision will need to be made as to whether the equipment should be replaced or converted so that it uses a permitted gas. Operators will need to take specialist advice on the practical and cost implications of these options.

A landlord who owns a building with, for example, an air conditioning system that currently uses recycled HCFCs will need to replace or convert that system, and will want to recover the costs of doing so from tenants.

- A landlord of a multi-let building may be able to recover the cost of replacing or converting the system via the service charge. This will depend on the drafting of the service charge provisions. For example:
  - Can the tenant be charged for the cost of replacing or improving equipment as well as repairing it?
  - Can the landlord charge the tenant in relation to the cost of complying with statute?
  - Is there a general sweeper clause enabling the landlord to recover any other reasonable costs incurred?
- A lease of a whole building is likely to contain a clause requiring the tenant to comply with all legal obligations (which will include not using recycled HCFCs to maintain or repair the air conditioning system from 1 January 2015 onwards), and will also generally require the tenant to obtain the landlord's consent to any alterations (and pay the cost of any alterations).

When dealing with a new lease, whether the landlord or the tenant is responsible for replacing or converting the system will be a matter for negotiation between the parties. For example, if the tenant is only taking a short lease of the premises it would seem more equitable for the landlord to be responsible for making the necessary changes to comply with statute. However, cost is not the only factor to take into account - the

replacement or conversion of an existing air conditioning system could also be disruptive to the tenant's business. Tenants should ensure that they find out if changes will be needed to existing systems so that they do not receive an unwelcome new year's surprise.

Care should be taken to use an appropriately qualified individual for any works involving HCFCs as failure to do so is an offence and you could be fined.

TLT LLP, August 2014, Contributor: Alexandra Holsgrove Jones

# NORTH AMERICA

## 12. United States Settles with Costco to Cut Ozone-Depleting and Greenhouse Gas Refrigerant Emissions Nationwide

SAN FRANCISCO – Costco Wholesale Corporation, one of the nation's largest retailers, has agreed to cut its emissions of ozone-depleting and greenhouse gases from leaking refrigeration equipment at more than half of its stores nationwide.

In the settlement announced today by the U.S. Environmental Protection Agency and U.S. Department of Justice, Costco will pay $335,000 in penalties for federal Clean Air Act violations and will fix refrigerant leaks and make other improvements at 274 of its stores, which EPA estimates will cost about $2 million over the next three years.

"Because of this settlement, Costco will cut its future greenhouse gas emissions equivalent to nearly 200 million pounds of carbon dioxide, supporting our efforts to cut greenhouse gases nationwide," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "Investing in better equipment and maintenance to stop wasteful refrigerant leaks is good for our environment and good for business."

"Compliance with the nation's Clean Air Act is key to protecting all Americans from air pollution that damages our atmosphere and changes our climate," said Sam Hirsch, Acting Assistant Attorney General for the Justice Department's Environment and Natural Resources Division. "Industry needs to lead the way in abandoning harmful chemicals in favor of using and developing greener, environmentally friendly alternatives to protect our health and our climate."

Costco violated the Clean Air Act by failing to promptly repair refrigeration equipment leaks of the refrigerant R-22, a powerful ozone-depleting hydrochlorofluorocarbon, between 2004 and 2007. Costco also failed to keep adequate records of the servicing of its refrigeration equipment to prevent harmful leaks. Destroying the ozone layer results in dangerous amounts of cancer-causing ultraviolet solar radiation striking the earth, increasing skin cancers and cataracts. R-22 is also a potent greenhouse gas with 1,800 times more global warming potential than carbon dioxide or $CO_2$.

The settlement requires Costco to retrofit or replace commercial refrigeration equipment at 30 of its stores to reduce ozone-depleting and greenhouse gas emissions. Costco must also implement a refrigerant management system to prevent and repair coolant leaks and reduce its corporate-wide average leak rate at least 20 percent by 2017. In addition, Costco will install and operate environmentally friendly glycol refrigeration systems and centrally monitored refrigerant leak detection systems at all new stores.

Today's settlement is part of EPA's national enforcement initiative to control harmful air pollution from the largest sources of emissions. The Clean Air Act requires owners or operators of commercial refrigeration equipment that use over 50 pounds of ozone-depleting refrigerants and have an annual leak rate over 35 percent to repair all leaks within 30 days.

Corporate commitments to reduce emissions from refrigeration systems have been increasing in recent years. EPA's GreenChill Partnership with food retailers reduces refrigerant emissions and decreases their impact on the ozone layer and climate change by transitioning to environmentally friendlier refrigerants, using less

refrigerant and eliminating leaks, and adopting green refrigeration technologies.

Costco, headquartered in Issaquah, Wash., operates 466 stores in the U.S. and additional stores worldwide, with revenues of $105.2 billion in 2013. Today's settlement covers 274 Costco stores with regulated commercial refrigeration equipment, including 67 stores in California, 14 in Arizona, 5 in Nevada, and 4 in Hawaii.

The proposed settlement is subject to a 30-day public comment period and final court approval. Read the proposed settlement.

Contact: Suzanne Skadowski, skadowski.suzanne@epa.gov

- USEPA Press Release, 3 September 2014

## 13. Seeds of Change

A new method could be strawberry growers' alternative to controversial fumigants

Last Tuesday, the Santa Cruz County UC Cooperative Extension in Watsonville was filled with growers, packers, shippers and scientists from the region's strawberry and caneberry industry—all wanting to learn more about Anaerobic Soil Disinfestation (ASD), a biological alternative to chemical fumigation in the fight against soil-borne diseases that can destroy crops.

The practice, first developed in Japan and the Netherlands, is gaining popularity among organic strawberry growers in the region, but the Aug. 19 workshop was filled with folks from the conventional farm industry, as the chemicals they have traditionally relied on have been increasingly targeted by regulators, farm worker advocacy groups and anti-pesticide activists, impacting how they operate and their bottom line.

Researchers believe that ASD could be a substitute for chemical fumigation in county agriculture, which involves the application of restricted-use pesticides including methyl bromide, a chemical being phased out around the world for its ozone-depleting properties, as well as chloropicrin and 1,3-Dichloropropene, which the EPA has labeled a "probable human carcinogen."

"The current industry is totally based on being able to fumigate, and now that perception is changing," says Jonathan Winslow, farm services manager at Farm Fuel Inc., which organized the workshop. "There needs to be [an] adoption of new practices that will accomplish the same things."

The Watsonville-based company, which got its start producing biofuel from mustard seed, has been experimenting with ASD on strawberries and other row crops for five years. It is in year two of a three-year grant from the California Department of Pesticide Regulation (DPR) to continue their trials and work to make ASD a commercially viable alternative to chemical fumigation.

Fumigation and ASD work differently; fumigants are injected into the soil or delivered through drip irrigation by licensed contractors and covered with a barrier tarp, enabling the trapped gasses to spread through the soil underneath.

ASD, on the other hand, uses a carbon source, such as rice bran, molasses, or grape pomace—a wine and juice-making byproduct, which is mixed into the soil. The soil is then covered with plastic mulch, sealed to keep oxygen out, and irrigated and monitored with soil sensors for approximately three weeks.

Currently, Farm Fuel has 22 trial sites for ASD across the state. "Research proves it works," Winslow says. "We are refining methods at this point, so it's the easiest and cheapest for the grower and still works at the level they need it to work."

According to an estimate from the California Strawberry Commission, which represents 400 growers and dozens of shippers and processors in the state, it costs about $3,335 per acre to fumigate.

Farm Fuel estimates the price of ASD at about $2,700 per acre. However, ASD requires more preparation and irrigation time, necessitating labor, and a large amount of carbon source—approximately six to nine tons of the stuff per acre, which has to be transported to site and then fully incorporated into the soil.

ASD can be used with various crops, not just strawberries, and growers around the country are experimenting with different carbon sources, depending on local availability—farmers in Tennessee are using wheat bran.

Some organic strawberry growers in the region already use ASD. Driscoll's research manager Dan Chellemi says approximately 20 percent of the organic strawberry ranches that grow for Driscoll's in Salinas and Watsonville are trying ASD. Other than ASD, Chellemi says the growers use mustard seed meal and high rates of compost to combat soil-borne diseases. Chellemi says to maximize the benefits and results of ASD,

it should be used in conjunction with cover cropping and crop rotation.

Goodbye, Bromide

For methyl bromide, though, the writing is on the wall.

The Montreal Protocol, an international treaty, effectively banned methyl bromide in 1989 due to its contribution to ozone depletion. As it has been gradually phased out in countries around the world, methyl bromide is only allowed to be used in special cases where petitioners showed that a viable alternative had not been found.

California strawberry growers are the last remaining industry in the United States to receive a Critical Use Exemption (CUE) by the Montreal Protocol for pre-plant soil fumigation because of the severe soil disease issues strawberry farmers face, says Chris Christian, Senior Vice President of the California Strawberry Commission.

Even as the Commission contributes to the search for fumigant alternatives through its Farming Without Fumigants Initiative, which invested $200,000 on ASD research this year, it received a CUE for 830,290 pounds of methyl bromide, which can be used in the state in 2015. “That amount will be able to treat less than 10 percent of total California strawberry acreage,” says Christian. (California grows approximately 90 percent of the nation’s total strawberry crop, she adds.)

The commission has applied for a Critical Use Exemption in 2016—that decision is still being considered by the Montreal Protocol and will be determined at a committee meeting later this year, she says.

- Good Times Online, 27 August 2014, By: Roseann Hernandez

# FEATURED

## OZONE SECRETARIAT

**What’s New Highlights**: http://ozone.unmfs.org/new_site/en/index.php

**Montreal Protocol Meetings** Dates and Venues **2014**

**TEAP May 2014 Reports**:

- **TEAP May 2014 - Progress Report (vol.1)**
- **TEAP May 2014 - Essential Use Nominations Report (vol. 2)** and
- **Critical Use Nominations Report (vol. 3)**
- **TEAP May2014- Decision XXV/5 Task Force Report: Additional Information to Alternatives on ODS (Draft Report) (vol.4)** - Final version (advance version replaced on 16 June 2014)
- **TEAP May 2014 - Response to Decision XXV/6 (vol. 5)**
- **TEAP May 2014 - Decision XXV/8: Assessment of the Funding Requirement for the Replenishment of the Multilateral Fund for the Period 2015-2017 (vol. 6)** - Final version (advance version replaced on 10 June 2014)

**Assessment Panels Meetings** - Dates and Venues **2014**

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

- The 73rd meeting is scheduled to take place in Paris, France from 9 to 13 November 2014.
- Documents related to the **72nd Meeting of the Executive Committee** Montreal, Canada,

12 - 16 May 2014, are now available.

## OZONACTION

**OzonAction "NewsDrops" Shared on YouTube** - A series of short video messages highlighting Scientific Fact-Finding on Ozone Layer…

View the videos

**International Standards in Refrigeration and Air-Conditioning** - This guide is intended to provide an introduction to standards and how they can be useful in supporting the adoption of alternatives in the context of the HCFC phase-out in developing countries.

**Informal Prior-Informed Consent (iPIC) - Summary Report** - This summary report briefly describes how the iPIC system works as well as its advantages. It provides some information on the results and successes of monitoring and controlling illegal and unwanted trade in ODS through the iPIC mechanism in 2013 and encourages countries which are not yet members to join and to begin to reap the benefits of this initiative…

**Phasing-out Methyl Bromide in Developing Countries: A success story and its challenges** - This booklet addresses the efforts undertaken to phase-out Methyl Bromide in developing countries, the lessons learned and what is pending to reach final phase-out. It further analyses factors that may impact or put at risk the continuity of the phase-out and possible ways to mitigate them. It aims to promote the south-south and north-south-south cooperation, facilitate information exchange on advanced technologies for materials, varieties, rootstocks, etc. and raise awareness on risk of reversibility of MB uses and encourage policy to avoid it happening...

**Third Edition of the Training Manual for Customs and Enforcement Officers** is updated to reflect the evolving role of Customs and enforcement officers in implementing their commitments under the Montreal Protocol. It includes additional information on all the substances now controlled under the Montreal Protocol, with a focus on hydrochlorofluorocarbons (HCFCs) which are primarily used as refrigerants and foam blowing agents. HCFCs replaced chlorofluorocarbons (CFCs) which were phased out by 1st January 2010. As most ozone depleting substances are also potent greenhouse gases, the section dealing with linkages between ozone layer depletion and global warming has been extended to include new scientific findings… See also the updated Poster "Customs Quick Tool for Screening ODS"

**Achievements & Highlights: 10th Anniversary of the Regional Ozone Network for Europe & Central Asia** The 10th anniversary brochure of the ECA network reflects a decade of network operation and aims to share major achievements, case studies and highlights to provide inspiration for countries within and outside the region. Government officials, refrigeration and enforcement experts, building planners and academia, Montreal Protocol secretariats, implementing agencies and bilateral partners, private sector companies and trade associations as well international organizations contributed more than 85 exciting articles and quotes to this bilingual English -Russian brochure.

**National Ozone Officers Guide**. This guide introduces and summarizes the many important issues about the Montreal Protocol on Substances that Deplete the Ozone Layer that Ozone Officers (NOOs) need to know to perform their job effectively. Presented in an easy to understand format, the guide is designed to provide new NOOs and their assistants with the critical knowledge needed to quickly understand the Montreal protocol system and the country's obligations under the Montreal Protocol.

**Putting a face to ozone depletion in Africa: HPMP Implementation in Africa, a special case study of Senegal**. This guide introduces the implementation of Montreal Protocol in Africa. It describes the HCFC phase-out management plans (HPMPs) in selected African countries, especially in Senegal. It focuses on ozone, climate and energy efficiency aspects.

**OzonAction Publications Catalogue 2014**. Information on science, policies, and technologies forms

the base of technology support and capacity building. Since 1991, the information clearinghouse of UNEP DTIE OzonAction has been helping developing countries to make informed decisions about phase-out by providing quality reviewed, need-based information services. Showcased in this catalogue - sector-wise, as well as function-wise - are more than 145 publications, CD ROMS, videos, posters, TV spots, radio spots, DVD and other awareness materials to help National Ozone Units (NOUs) and other stakeholders in industry and governments to build their capacity to implement the Montreal Protocol and at the same time derive climate.


**"The Arctic and the Ozone Layer"-** background: In 2011, extremely low ozone levels were recorded in the Arctic region. This episode in the North Pole - the Arctic - has triggered concerns on the trend of the ozone layer's recovery, expected to fully happen by mid-century. With the support of the Government of Norway, UNEP is investigating the causes of this depletion and the scientific explanations for such an unexpected episode in the Arctic. This 16-minute documentary reports the impacts on the region's ecosystem and the changes' foreseen risks in the Arctic that may affect human life also in mid-latitudes. This video output is jointly branded by the WMO (World Meteorological organisation) and brings to light some of the so much discussed inter-linkages between the climate and ozone issues on the voices of internationally known scientists. Click here to view video

# EVENTS

## 2014

AIRAH **Acoustics Workshop 2014**, Thursday, 18 September 2014, Sydney, Australia.

**Intercool**, 21-23 September 2014, Düsseldorf, Germany

**Journée du Ceren - réglementation, fluides à bas GWP, conséquences sur le marché et efficacité énergétique** Le 2 octobre 2014, Paris – France

**Énergies Froid**, 1-2 octobre 2014, Rennes, France - deux journées dédiées à l'information pour répondre aux questions et aux enjeux de la profession.

**Chillventa 2014**, 14-16 October 2014, Nuremberg, Germany - the Exhibition for Energy Efficiency, Heat Pumps and Refrigeration, Trends & Innovations from the Refrigeration and Air Conditioning Sector

**F-Gas Implementation Conference,** 11 November 2014, Carisbrooke Hall, London W1, UK - The new F-Gas Regulation will lead to new significant changes and challenges for the sector. This conference from the joint trade associations and professional institutes will provide clear and reliable information on these changes and how they impact key sectors...

**The International Symposium on New Refrigerants and Environmental Technology 2014**, organized by The Japan Refrigeration and Air Conditioning Industry Association (JRAIA), 20-21 November 2014, International Conference Center Kobe, Main Hall, Kobe, Japan.

**4emes journées chaine du froid des produits de santé**, organisées par AFF et SFSTP, 26-27 novembre 2014, à ENS Lyon, France,

**45th International HVAC&R Congress and Exhibition**, 3-5 December 2014, Belgrade, Serbia

## 2015

**ASHRAE Announces Call for Papers for 2015 Winter Conference**, 24-28 January 2015, Chicago, Atlanta


Registration is now open for the ultimate, total vehicle climate and thermal management, 3-day, live training event delivered by the best instructors in the business. **The Mobile Air Conditioning Society (MACS) Worldwide will hold its 2015 Training Event and Trade Show**, 5-7 February 2015, the Caribe Royale All Suite Hotel and Convention Center Orlando, FL.

The 2nd edition of **ATMOsphere Asia – Solutions for Asia**, 3-5 February 2015, aims to exhibit the latest natural refrigerant ($CO_2$, ammonia, hydrocarbons, air and water) technologies and projects applicable to the Asian market. The ATMOsphere Review Panel has officially issued a **Call for Case Studies** and is now accepting innovative, natural refrigerant based case studies for a variety of applications including commercial, light commercial, industrial and transport refrigeration, heat pumps, air conditioning and new areas of application... The deadline for abstract submissions is 01 December 2014.

**ATMOsphere Europe 2015 "Natural Refrigerants - Solutions for Europe"**, 16-17 March at the Crowne Plaza Le Palace Hotel, Brussels, Belgium

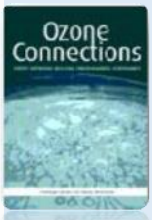
**International Conference IIR Commission B2 with B1 and D1 / Ammonia and $CO_2$ - Refrigeration Technologies**, 16-18 April 2015, Ohrid, Republic of Macedonia. See more events from the IIR website

Papers Sought for **International Conference on Energy and Environment in Ships** - Papers are being sought for a conference on ships and on land facilities that focuses on the state of the art and challenges related to environment, HVAC, energy security and health and safety among other topics. Organized by ASHRAE, the Hellenic Navy, the Technical Chamber of Greece and the ASHRAE Hellenic Chapter, the International Conference on Energy and Environment in Ships takes place May 22-24, 2015, in Athens, Greece. Abstracts (400 words in length) are due Oct. 13, 2014. If accepted, papers are due Jan. 26, 2015. Submittal and additional information can be found here

**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.

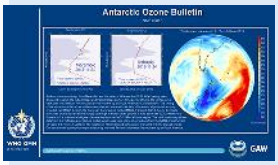
**Congress of Refrigeration**, 16-22 August 2015, Yokohama, Japan

# READING

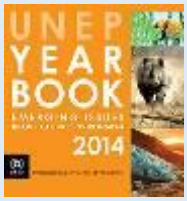



## Read / Download this publication for free -

Greenleaf Publishing is pleased to make its book "**Ozone Connections: Expert Networks in Global Environmental Governance**" authored by Penelope Canan and Nancy Reichman, freely available to the UNEP and its National Ozone Units worldwide for one year, beginning on 16 September 2013. Read more

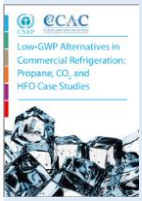



**WMO Antarctic Ozone 2013 Bulletins -** The World Meteorological Organization Secretariat issues bulletins containing information on the state of the ozone layer in the Antarctic at roughly two week intervals from August to November. The bulletins are based on data provided by WMO Members which operate ozone monitoring stations in the southern hemisphere and satellites to observe ozone globally. WMO Antarctic Ozone Bulletins: 2013



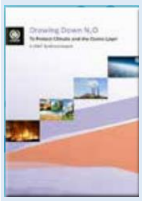

**UNEP Year Book 2014** Emerging Issues in Our Global Environment, which illustrates, across ten chapters, the emergence of current environmental challenges and explores innovative solutions to address them. [see pages 7, 8, 46]


"**The Antarctic Ozone Hole, An Update**", article in Physics Today, July 2014, Authors: Anne R. Douglas, Paul A. Newman, Susan Solomon. [see pages 42-48]




**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…


**CCAC Bulletin, Volume 172, Number 16**, 20 July 2014 [Pg 4] - […] On HFC Phase Down, one of the lead partners underscored that while HFCs are not dangerous for the ozone layer, they are powerful greenhouse gases and their emissions are growing rapidly. He added that due to their high global warming potential (GWP), the increase in HFCs can cancel the impact of climate change mitigation efforts addressing $CO_2$ emissions. The lead partner noted that discussions on global HFC phase down currently focus on four deliverables: refrigerant management; reducing emissions in the cold-food chain; public procurement of climate friendly alternatives; and global phase down of production and consumption of HFCs under the Montreal Protocol on Substances that Deplete the Ozone Layer. […]



**Drawing down N2O 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. Global anthropogenic N2o emissions are rapidly increasing and are expected to almost double by 2050 unless mitigation action is accelerated. The continued build-up of N2o, in the atmosphere will continue to deplete the stratospheric ozone layer and in so doing will to a degree undermine the achievements of the Montreal Protocol. The build-up of N2owill also make it more difficult to achieve climate targets.

**Draft outcome document of the third International Conference on Small Island Developing States**, 11 July 2014 - See item:

45. We recognize that the phase-out of ozone-depleting substances is resulting in a rapid increase in the use and release of high global-warming potential hydrofluorocarbons to the environment. We support a gradual phase-down in the consumption and production of hydrofluorocarbons.

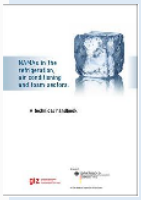

**GUIDE+: HFC taxes & fiscal incentives for natural refrigerants in Europe**, a comprehensive overview of existing and proposed fiscal measures aimed at reducing the HFCs use and emissions in HVAC&R sectors, while encouraging the switch to climate-friendly technologies, in key Europe countries.


**UNIDO & shecco launch first GUIDE on Natural Substances in Developing Countries** - The report, summarizing results from the ATMOsphere Technology Summit and global surveys gathering perspectives from emerging economies, is another clear step to strengthen shecco's involvement in international project activities helping developing countries seize additional climate benefits from natural refrigerants and foams.


RACA September 2014 VOL 30 NO 07 Digital


**Life after HCFCs – The Phase Out Begins** With the Phase out of HCFC refrigerants officially gazetted and underway, we take a closer look at these gases and the 'what now?' question that is plaguing industry.


**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.



A technical handbook by GIZ Proklima on **Nationally Appropriate Mitigation Action (NAMAs) in the refrigeration, air conditioning and foam sectors** (RAC&F) a comprehensive guideline for the preparation and implementation of cost-effective mitigation actions on that particular sector. Produced as part of a global project on NAMAs on RAC&F, financed by the International Climate Initiative of the German Environment Ministry.


"**GHG or not GHG: Accounting for Diverse Mitigation Contributions in the Post-2020 Climate Framework**." published by The Organisation for Economic Co-operation and Development (OECD)/International Energy Agency (IEA) Climate Change Expert Group (CCXG), highlights that the parties to the UNFCCC are working towards a new climate change agreement in 2015 and are likely to put forward a diverse range of intended national mitigation contributions. It notes that these contributions could vary from greenhouse gas (GHG) to non-GHG (such as energy efficiency) goals, using a variety of accounting approaches, which would determine the actual levels of emission reductions.


**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. Most of these low GWP alternative refrigerants are flammable…


**IIAR publishes new $CO_2$ guide** The International Institute of Ammonia Refrigeration (IIAR) has published a new edition of its $CO_2$ Handbook.


"Green Cooling for a Warming Wold". A new video by Proklima - explains how cooling technologies are linked to our climate and what it needs to ensure that they are truly environmentally friendly. The video shall enhance awareness on the harmful effects of F-gases on the ozone layer and the climate. Exemplarily, our "green cooling-family" discovers various practises of cooling in their life and learns about the use of natural refrigerants as an environmentally-friendly alternative to chemical refrigerants.

**Magnets Bring Refrigerators to the Brink of Revolution**- The developers of a new magnet-based cooling system claim their invention has brought the refrigeration industry to the "cusp of revolution."

# MISCELLANEOUS

US EPA GreenChill Webinar**: The Better Buildings Alliance Refrigeration Commissioning Guide for Commercial and Industrial Systems** – Date: Tuesday, September 23, 2014, Time: 2:00 pm to 3:00 pm (Eastern time), Paul Torcellini (NREL), Richard Royal (Wal-Mart), and Caleb Nelson (CTA) will lead a presentation on the Refrigeration Commissioning Guide for Commercial and Industrial Systems that was recently released by the Better Buildings Alliance. The webinar will provide information on the guide and its contents, and how it can be used by both retailers and design/engineering firms.

To join the webinar Go to: 1. https://epa.connectsolutions.com/betterbuildingswebinar/
-.Select "Enter as a Guest". *It is important that you select the option to enter as a guest*.
-.Enter your name.
- Click "Enter Room".
- Click "OK".
For audio: Call the toll free call-in number: 1-866-299-3188 (706-758-1822 from outside the U.S.)
- Use Conference Code: 202 343 9185#

**Reflections on the Chemicals and Wastes Landscape Towards 2020** – The slowdown of activities during a warm August (for those of us in the northern hemisphere) provides a moment to reflect on the current state of the international chemicals and wastes landscape before the more usual hectic pace quickly resumes, with a number of key events taking place on the international calendar during the remaining months of 2014 and into 2015. This article will seek to build on several astute observations made by previous authors in this series, as well as provide some additional observations thoughts, in particular noting three main challenges for the current and future international chemicals and wastes landscape. **continued**...

By: Jonathan Krueger, Former manager of UNITAR's Chemicals and Waste Management Programme

**AIRAH's Graduate Training Program on Track for 2015 Launch** – The training program will cover essential HVAC&R knowledge for engineering graduates – professionals who are employed in consulting or contracting firms, but who have had little or no exposure to the HVAC&R industry before employment. The pilot subject was "Introduction to HVAC&R – System Types and Applicability", from the Fundamentals subject group. The program will run for nine months, separated into two semesters. The content will be delivered online, with 100 hours' worth of topics divided into four key areas: Fundamentals; Equipment and Components; Systems; and Practice and Performance…

**E-learning module** for law enforcement officers on hazardous chemicals and wastes under the Basel, Rotterdam and Stockholm Conventions, jointly developed by the Secretariat and Interpol, in Arabic, English, French and Spanish.

**Maîtrise des installations de réfrigération fonctionnant à l'ammoniac (Matal Formation)**
Du 30/09/2014 au 03/10/2014 Les Sorinières (Nantes) - France

**Cataract: The Unseen Scourge**, article in "Business Mirror", 28 August 2014, By: Henrylito D. Tacio

**North American HVAC&R Industry / End User Survey on Natural Refrigerants**- invitation to participate *(if you haven't already)* in an industry survey and enhance your understanding of the North American heating, air conditioning and refrigeration (HVAC&R) market for natural refrigerants (carbon dioxide, hydrocarbons, ammonia, water, air). Survey results will be published in the GUIDE North America 2014: Natural Refrigerants - North America's Market Potential in late 2014. Take the survey here. Why participate? Survey participants will receive the results of this survey for free, and organizations already active in natural refrigeration are eligible to receive a free directory entry in the GUIDE publication. This survey is designed for industry experts and commercial/industrial end users with operation in Canada, Mexico and the USA. The questionnaire takes around 15 minutes to complete, depending on the level of detail you provide, and there is a maximum of 25 questions... Learn more

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