OzoNews
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In this Issue:

SPECIAL ANNOUNCEMENT >>>

Welcome to a New Member in the Montreal Protocol Family!

We are pleased to announce that Ms. Shamila Nair-Bedouelle has been recently appointed Head of the DTIE OzonAction Branch. She will officially take up her position in Paris on 18 December 2012. Shamila is a South African national, with an international career as research scientist and policy analyst in technology and innovation. She has worked in South Africa, Germany, France, the USA, and managed a wide range of international programmes in developing countries, especially in Africa.

We would like to extend to Shamila a warm welcome and
Wish her full success in her new functions as Head of the OzonAction Branch.

Communication from the Co-Chairs of the Scientific Assessment Panel

Seeking nominations (**by 19 December 2012**) of scientific experts to participate in the next quadrennial assessment to be completed in 2014 for consideration by the Parties in 2015…
Read more | Additional information on Assessment Panels | Decision XXIII/13: SAP Potential Areas of Focus for the 2014 Quadrennial Reports

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GLOBAL

1- Summary and Analysis of the Twenty-Fourth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, 12-16 November 2012 | Geneva, Switzerland

Click here to read/download
SOURCE: IISD Reporting Services (IISD RS)
See also >>
> Ozone Secretariat MOP 24 website
> UNEP OzonAction @ MOP 24

2- Atmospheric Conditions Cause Second Smallest Ozone Hole in Two Decades

An ozone sonde is released from the Balloon Inflation Facility at the South Pole Station earlier this year. Ozone depletion above Antarctica was much less this austral spring due to warmer temperatures in the stratosphere. Photo Credit: Sven Lidstrom

Peter Rejcek, Antarctic Sun Editor: The annual ozone hole that forms above Antarctica during the Southern Hemisphere spring is the second smallest recorded in two decades.

However, scientists with NASA and NOAA say the reason is due to warmer-than-normal air temperatures in the stratosphere where the hole forms each year rather than a sign of real recovery.

"It happened to be a bit warmer this year high in the atmosphere above Antarctica, and that meant we didn't see quite as much ozone depletion as we saw last year, when it was colder," said Jim Butler with NOAA's Earth System Research Laboratory in Boulder, Colo.

Measurements of ozone in the upper atmosphere come from satellites, ground-based stations and balloon-borne instruments released from various locations around Antarctica, including the Amundsen-Scott South Pole Station , which is managed by the National Science Foundation as part of the U.S. Antarctic Program .

The Atmospheric Research Observatory (ARO) is one of the six atmospheric baseline observatories for the Earth System Research Laboratory's Global Monitoring Division . NOAA scientists based at ARO launch balloons to measure ozone vertically at least once a week year-round at the South Pole, and more frequently in the austral spring when the ozone hole forms.

"This has been a very unusual year for ozone depletion, and it's certainly shown in our data," said NOAA Station Chief Heather Moe.

The ozone layer in the Earth's stratosphere, between about 10 and 30 kilometers above the ground, helps shield the planet from harmful ultraviolet radiation. Human-produced compounds known as chlorofluorocarbons, or CFCs, release ozone-destroying chemicals into the atmosphere that are responsible for the depletion.

Extreme cold, ice-cloud formation in the stratosphere, and a pattern of rapidly circulating air, called the polar vortex, make the ozone layer over Antarctica much more vulnerable to CFC destruction than almost anywhere else on the planet. However, more recently, the Arctic has experienced similar depletion events. [See previous article -- Recovery and regression: Antarctic ozone hole should start healing, while Arctic hole getting worse.]

The Antarctic ozone hole forms in September and October, and this year, the hole reached its maximum size for the season on Sept. 22, stretching 21.2 million square kilometers, roughly the area of the United States, Canada and Mexico combined. The largest ozone hole recorded to date was in 2000 at 29.9 million square kilometers.

Ozone sondes, the instruments launched by balloon from the South Pole, show that by Oct. 5 the main depletion region from between 14 and 21 kilometers is "fairly well cleared out," according to Moe, though the ozone never dropped all the way to zero as it has in years of heavy depletion.

However, 10 days later, while the main depletion region is still evident, a huge amount of ozone returned to the top of the profile, based on the 22-year average. The temperature in the upper part of the stratosphere was also significantly warmer.

"We're exceeding the previous warmest ever -- if ever is defined as the last 22 years [that we have records] -- for this time of year from 13 to 26 kilometers, and not just by a little bit," Moe said.

For example, the temperature at 20 kilometers was below minus 75 degrees Celsius on Oct. 5. Ten days later, it was about 30 degrees warmer at the same altitude.

It's been 25 years since an international agreement, the Montreal Protocol , was signed to regulate production of ozone-depleting chemicals. However, NOAA scientists say it could be another decade before they detect early signs of Antarctic ozone layer recovery. The ozone layer above Antarctica likely will not return to its early 1980s state until about 2060 due the large quantity and long lifetime of ozone-depleting substances in the atmosphere.

SOURCE: The Antarctic Sun, 19 November 19, 2012, **http://antarcticsun.usap.gov/**

AFRICA

3- Guinea Bissau Strives to Comply With The 2013 HCFC Freeze

Bissau, 5-9 November, 2012- The United Nations Environment Programme (UNEP) conducted the first ever HCFC Phase-out Management Plan (HPMP) Training of Trainers in Bissau. This was a joint training workshop aimed at providing technical assistance and policy guidance to refrigeration technicians and customs officers of the country. The five day training, which was opened by Hon. Dr. Agostinho da Costa, Minister for Environment, comprised of a series of sessions with discussions on general ozone related topics held on the first day and separate working group sessions for the customs officers and refrigeration technicians held in the subsequent days. Key officials who attended the training included: Mr. Quecuta Njai, National ODS Officer; Mr Aruna Sow and Mr Fati, refrigerant consultants; Mr Dasilva, Director of the National Refrigeration training school; and Mr. Yamar Guisse, UNEP OzonAction Programme Officer.

In his opening statement, Hon. Dr Agostinho da Costa, welcomed participants and strongly encouraged them to use good practices in refrigeration like recovery and recycling. He pointed out that Guinea Bissau achieved total phase out of CFCs, Halons and carbon tetrachloride, and completed the ratification process for the Montreal and Beijing Amendments.

"Guinea Bissau completed its Terminal Phase-out Management Plan (TPMP) implementation in 2010 and started its HPMP implementation in 2012. The Guinea Bissau Government is now committed to comply with the 2013 and 2015 Montreal Protocol control measures." Dr Agostinho da Costa concluded.

Mr. Guisse, in his remarks stated that the 65th Multilateral Fund Executive Committee meeting approved the HPMP for Guinea Bissau, and the country's National Ozone Unit requested UNEP to be the implementing agency for the non-investment activities.

UNEP provided a guide on the use of identifiers Ultima ID Pro version RI-700H for the identification and control of HCFCs; created a HCFC data base management for better storage and sound management of recovered refrigerants; and trained the local team on the management of a recovery and recycling centre.

"The National Ozone Bureau will acquire refrigerant identifiers; organize training workshops for refrigeration technicians and customs officers; monitor and evaluate the results of the training programs; and submit a follow-up report to UNEP three months after finalization of the workshops." Mr. Guisse underlined.

In the course of the training, recommendations discussed highlighted the need for the National Ozone Unit to strengthen its collaboration with the National Association of refrigeration technicians and the refrigeration training school.

The Montreal Protocol requires countries to freeze consumption of HCFCs by 1st January 2013, reduce it by 10 percent by 1st January 2015 and by 35 percent by 1st January 2020. The HPMP approach allows the national strategy to be updated as new technologies are developed. Stage one of Guinea Bissau's HPMP addresses meeting the baseline freeze for HCFCs in 2013, the 10 percent reduction in 2015 and later 35 percent reduction by 2020. Indeed, this is a big challenge and the first target is only a few weeks ahead. This training of trainers therefore comes in handy as the country will use these trainers to train the remaining refrigeration technicians, customs officers as well as forest guards (other enforcement officers) to subsequently comply with the 2013 HCFC freeze.

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4- Alternative Steam-Based Soil Fumigant Solution Now on Offer

A technology that replaces chemical methyl bromide (MeBr) with steam to fumigate and disinfect soil before new plants are planted is now avalable in South Africa.

Nonprofit organisation Timbali Technology Incubator, which develops small-scale agriculture businesses, is the first to introduce the technology, known as the Moeschle boiler, locally.

MeBr is an odourless, colourless gas that has been used as a soil fumigant to control all soil-borne diseases in various agriculture sectors, including the flower and vegetable farming practised by Timbali's agribusinesses.

Because MeBr depletes the stratospheric ozone layer, the amount of MeBr produced by agriculture and imported from the US was reduced incrementally until it was phased out in January 2005.

Africa lags in phasing out MeBr, but needs to meet a Montreal Protocol-linked deadline for implementing alternative disinfection methods by 2015.

The Moeschle boiler steams the soil to achieve the same or better results as when a chemical fumigant is used. Passive steaming was used to produce the replacement, but the technology packaging of this machine has resulted in the same benefit at 95% efficiency.

The boiler was sponsored by the Eskom Foundation and only two other sites in Africa – Uganda and Kenya – currently use this technology.

The technology involves the boiler, which is mobile, with steam that goes directly into the soil, a process that takes up to four hours.

The equipment will generate an income stream for Timbali. The organisation was established to bring start-up small to medium-sized companies in the agriculture sector into the mainstream economy, while promoting environment-friendly agricultural practices.

SOURCE: Engineering News, 23 November 2012, **http://bit.ly/Tqbbg2**

NORTH AMERICA

5- Restricted Coolant Depletes Ozone, But Use Continues Without Homeowners' Notice

A repair technician removes an air-conditioning unit that uses HCFC-22, which is banned for use in new units, to install a new one that uses the R-410A coolant in Marlboro, N.J. Environmentally harmful HCFC-22 is being phased out, but common repairs to air conditioners keep the gas in circulation with little federal enforcement. Marcus Yam / The New York Times file photo

When Mark Spector's central air-conditioning system stopped cooling his Trumbull, Conn., home this summer, he sent an SOS to his repairman. What happened next illustrates the myriad challenges the United States faces as it tries to phase out the popular but environmentally devastating cooling gas that was in Spector's unit.

The Environmental Protection Agency has tried to reduce use of this gas, HCFC-22, which depletes the ozone layer and contributes to global warming, by imposing strict quotas on its production. Since 2010, it has also banned the sale of new air-conditioning units containing the compound and has promoted recycling of the gas from old machines so it will not be released.

But what happened next in Spector's home circumvented all the agency's rules and good intentions: Instead of finding and repairing the hole in his aging unit, a complicated task, a serviceman pumped in more coolant, which leaked out by the next day. When Spector called around for another solution, a salesman offered to swap in a new condenser unit, but one that still used HCFC-22 — meaning one more U.S. home would continue relying on an environmentally damaging coolant for years.

HCFC-22 is being phased out of air conditioners worldwide under an international treaty called the Montreal Protocol, and the United States has aggressively pressed poor countries to pick up the pace. But the United States has yet to put its own house in order. And, with 140 million central air units still running on HCFC-22 in this country, it is a major offender.

Leaks abound in working equipment. Coolant seeps out of discarded equipment in landfills. Regulatory loopholes allow manufacturers to sell parts that rely on HCFC-22, so systems using the old gas can be refurbished rather than replaced. There is almost no reclamation of the gas from old machines for recycling. The EPA is behind schedule on ratcheting down domestic production, and smuggling is rarely detected. Even where there are regulations — for example, repair technicians are legally bound to collect old gas rather than vent it — there is little enforcement.

And, as Spector discovered, many of the environmental crimes and misdeeds that keep the country dependent on HCFC-22 happen on your property, most likely without your knowledge.

"It's totally illegal to vent gas, but it's also totally inconspicuous," said Stephen Andersen, a former EPA official who has campaigned for better controls on cooling gases. "I always watch like a hawk when they're in my yard," he said of technicians.

The concentration of HCFC-22 in the atmosphere is 218 parts per trillion, more than double the amount two decades ago, and it gets there in a number of ways. Low-quality or old equipment leaks, and detecting the colorless and odorless gas without pressure-testing devices is difficult. Sometimes the release is intentional, because it costs less. For example, installing a new part properly usually requires first siphoning a machine's coolant into a canister, for later replacement. But it is quicker, though illegal, just to cut the line. A technician saves half an hour on a job, and the customer gets a smaller bill.

Bobby Ring, who runs a servicing company in suburban New Jersey, said that makes it hard for him to compete. "There are contractors out there who refuse to make the investment in recovery equipment to reclaim or recover refrigerants, and no one is looking, so — phsssst — they let the refrigerant escape," he said.

Although large companies, which are required to report coolant use, have been fined for large leaks, the EPA has never prosecuted a residential service company for intentionally releasing HCFC-22.

Asked about the lack of backyard enforcement, David Bloomgren, a spokesman for the EPA, said it is "a challenge to locate or obtain evidence of illegal venting," so the agency focused on large polluters but encouraged homeowners to report possible backyard violations they observed to an EPA tip site at epa.gov/tips.

While it is hard to quantify exactly how much coolant is illegally released from America's residential air conditioners, the EPA estimates that only 7 percent of used coolant is turned in for recycling.

“The vast majority of it hits the sky," illegally vented, said Kevin Zugibe, chief executive of Hudson Technologies Inc., a company set up to recycle HCFC-22.
Under the Montreal Protocol, the United States has until 2015 to cut production and imports of newly made HCFC-22 to 10 percent of what it was a decade ago.
Without a much better supply of recycled HCFC-22, the United States will not be able to do that — or have enough to service all the older air conditioners, grocery store freezers and other refrigeration equipment.
In the European Union, only recycled or reclaimed HCFC-22 can be legally used to service equipment. In Australia and Japan, recovery of the gas from old appliances is mandatory, and technicians receive a fee for collection.
But the EPA has no plans to enact requirements or incentives for recycling in the near future, preferring to rely on market pressures, Bloomgren said. In January, the EPA proposed more specific limits on domestic production for the coolant, in the hope that curtailing supply would force “more recovery and reuse of HCFC-22 in large systems, as well as encourage transition to HCFC-22 alternatives." It said those rules would be in place by May, but they still are not.
But with weak incentives, repair technicians say, it seems a waste of time to collect the gas, and some distributors even charge extra to those who do the right thing and bring it back for recycling.
The EPA has tried to address overuse of the gas by regulating air-conditioning equipment, forbidding the sale of new machines containing the gas starting in 2010.
Initially, when the rules were proposed months earlier, manufacturers responded by introducing systems that ran on more environmentally friendly — if costlier — gases; they struck old models from catalogs. But at the last minute and in the face of a recession, the EPA publicized that it would allow owners of older systems to replace any and all parts so long as the new parts did not contain the coolant.
Unfortunately, as Spector discovered this summer, that created a loophole that subverted the mandate:
Manufacturers could sell condenser units — the major component of every air-conditioning system — that were empty of coolant gas. Then, after installation, a worker could simply add new HCFC-22, complying with the letter if not the spirit of the law.
SOURCE: New York Times News Service, 23 November 2012, By Elisabeth Rosenthal and Andrew W. Lehren, **http://bit.ly/Va5YJ5**

LATIN AMERICA AND CARIBBEAN

6- El agujero de ozono redujo las lluvias y ya afecta a los bosques

Un grupo de investigadores del Conicet reveló que el agujero en la capa de ozono produjo un desplazamiento de los vientos en el hemisferio sur y que esto derivó en una alteración de los patrones de lluvias, que redujeron su duración e intensidad en los bosques patagónicos. Los resultados publicados en la prestigiosa revista Nature Geoscience indican que se alcanzó la tasa de crecimiento más baja de los últimos 600 años.

El agujero de ozono redujo las lluvias y ya afecta a los bosques.

Para un ciclo normal, los ecosistemas boscosos en la Patagonia, que cobijan especies como el ciprés, la araucaria, el alerce y el coihue, necesitan recibir abundantes precipitaciones. Su disminución complicará la conservación de estas especies a través del aumento en focos de incendios, eventos de mortalidad, falta de regeneración de nuevos brotes y una menor capacidad de recuperación frente a otras presiones ambientales como el pastoreo intensivo.
“Las lluvias abundantes del sector norte de la Patagonia se desplazaron más al sur y por lo tanto llueve menos en el área”, advierte Ricardo Villalba, investigador principal del Conicet en el Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales (Ianigla) y autor principal del estudio.
Lo curioso es que los árboles que crecían en las montañas muy húmedas y frías de Nueva Zelanda y Tasmania, al sur de Australia, habían registrado también crecimientos inusuales durante las últimas décadas, pero a diferencia de lo que se registraba en los Andes Patagónicos, estos árboles habían tenido su mayor crecimiento desde el 1700.
“Mientras que en Tasmania y Nueva Zelanda llevó a un aumento en la temperatura y favoreció el crecimiento de las especies, en Chile y Argentina produjo una disminución de las precipitaciones”, sintetizó Antonio Lara, del Laboratorio de Dendrocronología y Cambio Global de la Universidad Austral de Chile.
Para dar una respuesta a este interrogante, se estudiaron las variaciones de los anillos de más de 3.000 ejemplares de seis especies de Argentina, Chile, Nueva Zelanda y Tasmania. Su análisis mostró que los patrones de

crecimiento entre 1950 y 2000 son significativamente diferentes a los registrados en los últimos 250 años, y que en los últimos seis siglos no habían mostrado un crecimiento tan reducido.
El agujero en la capa de ozono, según explica la investigación, tuvo influencia en la Oscilación Antártica del Hemisferio Sur, un fenómeno que controla la variabilidad climática en el hemisferio. Así generó que se desplazaran hacia el sur los vientos del oeste, que son los que traen las precipitaciones.
Las variaciones en los anillos de los árboles que crecen en los Andes Patagónicos brindan la posibilidad de colocar estos cambios climáticos en el contexto de los últimos siglos y por lo tanto dar respuesta a este interrogante, explican los científicos.
"El desafío es que los niveles de ozono vuelvan a sus valores normales. Desde la aplicación del protocolo de Montreal se observa una estabilización. Y si bien no crece, tampoco se observa una reducción. Si todo se llegara a normalizar, para volver a los niveles de hace 50 años, cuando no se había iniciado la destrucción, habría que esperar hasta 2050", sostiene Villalba.
SOURCE: AimDigital, 26 Noviembre 2012, **http://bit.ly/UWfSh5**

7- HC Training Becoming Increasingly Important in Caribbean Countries

In Caribbean countries, such as Barbados and Grenada, natural refrigerants have been identified as possible options to replace ozone-depleting hydrochlorofluorocarbons (HCFCs). The necessity of raising awareness of technical specificities related to these refrigerants has been highlighted on several occasions.

As the new technologies become increasingly adopted in Caribbean countries, the urge to train technicians and installers to work with these refrigerants becomes more important.

Barbados seminar highlighted HC training needs
During a recent stakeholder consultation, Mr Leslie Smith, Consultant on the Barbados HCFC Phase-Out Management Plan, pointed out that there were not enough trade technicians to install and service equipment using hydrocarbons. "There is a need now to build capacity to handle this technology because it is going to come. The time is now to get ready for new and emerging technologies that are on the way to Barbados," he said.
The consultation highlighted that hydrocarbons are becoming very popular in different parts of the world not only because of their environmental characteristics, but also due to higher levels of energy efficiency. "Natural refrigerants, particularly hydrocarbons, are possible replacement options for small systems and commercial refrigeration systems," he noted. Moreover, he pointed out that also other natural refrigerants such as ammonia and CO2 are on rise especially in Europe, USA and Canada.

Training opportunity in Grenada
The National Ozone Unit of Grenada in conjunction with the United Nations Environment Programme, Regional Office for Latin America and the Caribbean (UNEP/ROLAC) and the Grenada Refrigeration Air-Conditioning and Ventilating Association (GRAVA) is organising a three-day regional training workshop in Alternative Refrigerants to Ozone Depleting Substances for technicians of the Refrigeration and Air-Conditioning Sector on 27-29 November 2012.
The training will be devoted to two primary areas – hydrocarbon and R410a technologies. NOU Certified Trainers, Mr. Michael Mitchell and Mr. Henry Frederick of the Grenada Refrigeration, Air-Conditioning and Ventilating Association (GRAVA), will conduct the Hydrocarbon component of the training.
Mr Mitchel held a similar training on hydrocarbon technology themed "Taking the Myth out of Hydrocarbons" in February 2012 in Grenada. Fifty-eight technicians attended the training, which focused on the following topics:
- Hydrocarbon Refrigerant - Chemical and Physical Properties;
- Safe Handling;
- Charging Techniques;
- Retrofitting; and practical sessions which involved the retrofitting of refrigerators and Mobile Air Conditioning Systems (MAC) and conversions of small mini split AC system

The Barbadian technician showed a high level of interest in hydrocarbon refrigerants. The training included also a practical demonstration in the use of hydrocarbons during which two vehicles, a bottle cooler, a domestic refrigerator and a mini-split air-conditioner was converted to hydrocarbon.
SOURCE: Hydrocarbon 21, 20 November 2012, **http://bit.ly/TvRKBY**

ASIA PACIFIC

8- Interpol Hosts the 13th Forum against Environmental Crime in Asia


Bangkok, 27 November 2012 –The 13th Asia Regional Partners Forum for Combating Environmental Crime, also known as ARPEC, opened today at the Royal Thai Police (RTP) headquarters in Bangkok, Thailand. In the seven years since its inception, this is the first time that the meeting is hosted by the International Criminal Police Organization (INTERPOL), with support from RTP.

"ARPEC was established in 2005 as a result of the need to address the issue of illegal trade in ozone-depleting substances like CFCs, in the Asia-Pacific region by involving Customs and other enforcement officers. UNEP OzonAction is pleased to see that today, enforcement institutions like Interpol and the Royal Thai Police have now taken a leadership role in tackling environmental crimes as whole," said Mr. Atul Bagai, Senior Regional Coordinator of UNEP Regional Office for Asia and the Pacific.

ARPEC is a platform for discussion, partnership-building, networking and identification of innovative responses for addressing environmental crime, such as the illegal trade in ozone-depleting substances, electronic waste, trafficking of wildlife, and illegal logging among other forms of environmental crimes.

"We are delighted that partners have agreed to rotate the hosting of the meeting since 2011, although UNEP continue to offer a back-stopping service to the Forum," Mr. Bagai added.

The theme of the 13th meeting is "Investigation and Prosecution of Transnational Environmental Crimes". Discussions on international cooperation and policy, intelligence gathering and sharing through information technology, criminal justice and other emerging threats are the core in the two-day agenda of the forum.

Police Lieutenant General Ekkarat Meeprecha, Assistant Commissioner General of RTP, said in his Keynote Speech, "The ASEAN region alone, a biodiversity rich region, has been recognized as point of origin, transit and destination of environmental crime… RTP recognizes the importance of regional cooperation and pledges to strengthen close cooperation with all agencies to fight against environmental crime. In the era that the world is driven by unseen communication forces, a nation cannot work alone to deal with crimes, but needs the regional and international joint effort to help each other to collect necessary evidence, to locate environment criminals and to arrest and bring them to justice."

As a result of previous ARPEC meetings, several important initiatives have flourished; among them are: the *Project Sky Hole Patching* led by China Customs and Regional Intelligence Liaison Office (RILO) Asia-Pacific, *Project PATROL (Partnership against Transnational-crime through Regional Organized Law-enforcement)* led by the United Nations Office on Drugs and Crime (UNODC), and the ARPEC Awareness event in November 2009.

The next ARPEC meeting is scheduled in May 2013, with FREELAND Foundation being the host.

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9- Experts from Asia-Pacific Countries Gather in Philippines to Tackle Global Environmental Crime

Cebu, 23 November 2012 – Representatives from twenty-six countries across Asia-Pacific region and beyond gathered this week in Cebu, Philippines, to address the growing challenge in preventing and controlling the international trade in hazardous waste and chemicals. These dangerous products could be illegally traded, resulting in high economic cost to receiving countries and immeasurable harm to human health and ecosystems over many generations.

Maximizing upon the severity of the issue, this is a joint meeting of the Asian Network for the Prevention of Illegal Transboundary Movement of Hazardous Waste and the 1st Workshop of the Regional Enforcement Network for

Chemicals and Waste, known as Project REN. This joint event, held from 20 to 23 November in Cebu, Philippines, strategically brought together national environmental authorities responsible for chemicals and waste management and enforcement officers from Customs Administrations and Police Forces across the region. Also attending were intergovernmental organisations such as the United Nations Environment Programme (UNEP), the World Customs Organization Regional Intelligence Liaison Office (WCO RILO) and Regional Office for Capacity-building (ROCB), the United Nations Office on Drugs and Crime (UNODC) and other international experts.

This international meeting will address the growing illegal trade in waste products, such as electronic waste. Focus will be made on best practices and approaches to control trade in chemicals such as ozone-depleting substances and others controlled under multilateral environment agreements,

Speaking on behalf of the Ministry for Environment of Japan, Mr. Kazuhiro Yoshida, Director for Office of Waste Disposal Management, Waste Management and Recycling Department, said, “this is the important opportunity to join two networks and to share experiences and good practices to combat illegal transboundary movement of hazardous wastes and chemicals. I recognize that all the participants have learned from each other to tackle our common issue.”

The Asian Network is a network to combat illegal transboundary movement of hazardous wastes and other wastes under the Basel Convention. The participating countries share their latest legal framework and activities for the Basel Convention at its annual meeting.

Project REN is a new initiative funded by the Swedish International Development Cooperation Agency (Sida) and coordinated by UNEP Regional Office for Asia and the Pacific based in Bangkok, Thailand. It aims to develop the response to pollution crimes by supporting 25 countries across the region in areas such as information and intelligence management, building capacity through sharing best-practice, and developing operational responses. The project will continue until 2014 and aims to develop sustainability in the responses beyond that date.

Ms. Kakuko Nagatani- Yoshida, UNEP’s Montreal Protocol Policy and Enforcement Officer said, “We are fortunate to hold this meeting in the beautiful province of Cebu as a reminder of the importance to address pollution crimes which particularly affect sensitive environments and vulnerable communities. Project REN will bring together key partners and enhance the way that we tackle this emerging form of transnational organized crime.”

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10- China Gets Funding Support to Phase Out HCFC

The World Bank on Thursday approved a grant of US$73 million from the Montreal Protocol Investment Fund to China to support its efforts to meet its HCFC consumption and production phase-out obligations.
Hydrochlorofluorocarbons (HCFCs) are ozone-depleting substances (ODS) with high global-warming potential and subject to consumption and production control measures of the Montreal Protocol on Substances that Deplete the Ozone Layer. The Montreal Protocol requires gradual phase-out starting from 2013 and leading to a complete phase-out of HCFC consumption and production by 2030 for developing countries known as "Article 5" countries.
China is the world’s largest producer and consumer of HCFCs. In 2009, China produced more than 70 percent of the global HCFC supply and was responsible for more than half of the global HCFC consumed for manufacturing foam and refrigeration products, producing solvents, and servicing existing equipment. Therefore, phase-out of HCFCs in China is critical for the successful implementation of the Montreal Protocol.
“Phasing out of HCFCs presents opportunities for China not only in the redesign of its products to ozone-friendly technologies but also from the benefit of new available technology that is more energy efficient,” said Viraj Vithoontien, Senior Environmental Specialist of the World Bank. “Improving thermal insulation, increasing energy efficiency of refrigeration and air-conditioning products, and replacing the production of HCFCs with environmentally friendlier alternatives through the modernization of existing manufacturers; alongside an enabling policy and regulatory framework, will allow China to improve its efficient use of energy and its limited resources. This will also significantly contribute to global efforts to combat climate change”.
Designed to help China phase out both its production and consumption of HCFCs in the polyurethane (PU) foam sector, the China HCFC Phase-out Project provides support to the following activities:
• Investment in HCFC-141b consumption reduction. Focus will be on introduction of alternative technologies to support phase-out of about 12,000 MT of HCFC-141b in three subsectors including reefers and containers, refrigeration and freezers, and small household appliances, and on provision of support to select enterprises in other subsectors, including insulation pipes and panels, solar water heaters and block foam, to cut another 2,000 MT of HCFC-141b consumption in order to meet the overall reduction target of at least 14,000 MT by 2015;
• In addition to investment in HCFC-141b consumption reduction, the project will also provide support to initiate efforts to reduce production of HCFCs, technical assistance, policy support and project management to ensure timely and sustainable phase-out of HCFCs, and preparation of HCFC phase-out activities beyond 2015.
The World Bank is one of the implementing agencies for the Multilateral Fund for Implementation of the Montreal Protocol. The Bank has been engaged in ODS phase-out activities in China since the early 1990s, and served as its partner in both the CFC Production Closure Sector Plan and the Foam CFC Phase-out Sector Plan under the ODS IV Project.

SOURCE: China Org, 23 November 2012, **http://bit.ly/V87ifr**

WEST ASIA

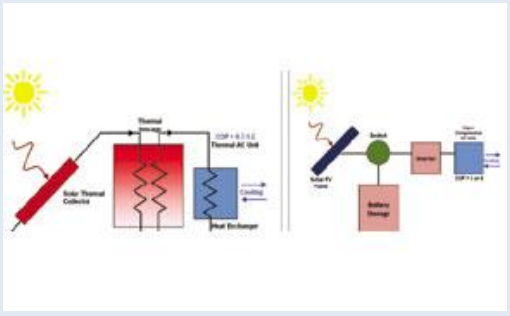
11- HCFCs' Elimination Workshop Organized by the Kingdom of Bahrain's Supreme Council for the Environment

Manama: Nov. 29 -- (BNA) The Supreme Council for the Environment organized yesterday a nationwide workshop on the plan for elimination of hydro-chlorofluorocarbon (HCFC) substances and the quota system in the Kingdom of Bahrain in collaboration with the United Nations Development Program (UNDP) and the United Nations Environment Program for West Asia (UNEP).

The workshop was inaugurated by the general director of the Supreme Council for the Environment Dr. Adel Khalifa Al-Zayani in the presence of a number of senior officials from the UNDP and the UNEP. As per the Montreal Protocol, HCFC substances are ozone depleting substances whose manufacturing and consuming should be phased out over the next twenty years.
The workshop discussed the removal of HCFCs and the quota system in the Kingdom of Bahrain, as part of the Kingdom of Bahrain's obligations towards the Montreal Protocol namely curbing, restricting the importing of HCFCs or rather R-22 substance which used in cooling and air-conditioning systems in the Kingdom.

The parties of Montreal Protocol agreed to expedite the timetable in order to gradually eliminate HCFCs in developing countries and also agreed to curb the use of these substances and to freeze the level of HCFCs' consumption at the level of the year 2009. (IY)
SOURCE : Bahrain News Agency, 29 November 2012, **http://bit.ly/SgaqHJ**

12- Solar Cooling Technology: Answers and Challenges



The built environment has a direct impact on the natural environment, the economy and human health. Buildings have to respond to local climate and site conditions to maximise building users' comfort and health while minimising energy use.
Buildings present both a major impediment to reducing our reliance on the burning of fossil fuel due to the fact that Qatar and the Gulf region, in general, is situated in the red zone which enjoys maximum sun exposure leading to high temperatures and hot weather, and a real opportunity for achieving significant reduction in global carbon emissions if such solar energy is captured and utilised efficiently.
As such, growing demand for air conditioning in recent years has caused a significant increase in demand for energy resources. Air conditioning demand accounts for more than 60% of the electricity consumption in Gulf Cooperation Council (GCC) countries. Therefore, experts argue that all efforts geared towards lowering energy consumptions will not be successful unless the air conditioning energy demand is managed effectively. Current approaches to this challenge include passive buildings design, introduction of buildings management systems, installation of efficient controls and equipment, implementing strict operation and management procedures, educating tenants and occupiers on how to operate buildings efficiently and finally introducing innovative technological solutions.
It can be taken for granted that development of more efficient HVAC technologies is much more constrained now than 20 years ago, especially on the use of Chlorofluorocarbons (CFCs) and Hydrofluorocarbons (HCFCs) refrigerants which are believed to contribute to the depletion of the earth's ozone layer. Carbon dioxide (CO_2) emissions should be curtailed as a prudent response to potential global warming.
The attractiveness of cooling obtained from the sun has spawned a wealth of research over the last several decades. Although producing cooling from solar energy remains an inviting and challenging prospect in the Gulf region but the research and application remain very limited compared to the cooling needs and population growth. Qatar has abundant solar resources, where the annual Global Horizontal Irradiatiance reaches approximately 2,200 kWh/m2 in the south of the country which is considered an attractive opportunity compared to other countries especially in Europe.
The high correlation between the availability of solar energy and the need for cooling in a building provides an inherent advantage to solar driven cooling systems especially in this region.
Solar absorption cooling technology has gained attention in the past decades and recently in the Gulf Region. Absorption chillers use a thermal energy instead of mechanical compressors as in traditional refrigerators and the high energy needed is used to run the compressors. There are three phases to the absorption chilling process:

evaporation, absorption and regeneration. Currently, most of the solar cooling systems in use are hot water driven lithium bromide absorption chillers. The Qatar-2022 chilling showcase stadium presented to FIFA in 2010 captured the latest generation of solar heat collectors, and have a series of motorised mirrors that track the sun, focussing the sun's power onto collecting tubes and heat the water to 200oC which is then converted to cooling via absorption chillers3.

Despite the many advantages of solar absorption cooling systems they have some disadvantages such as low system efficiency; COP of about 0.7 to 1.2. Conventional air conditioning systems have COP of 3 to 6 this means solar based systems have an efficiency of only 205 compared to conventional mechanical systems.

To overcome this inferior performance genuine research is needed to test the technology in actual arid-hot working environment experienced in Gulf Region. Understanding the challenges and opportunities, the Gulf Organisation for Research and Development (GORD) is developing locally an innovative renewable system for solar combined cooling and power generation. The system will be capable of providing heat and electricity from the sun using Concentrated Solar Power (such as parabolic dish, linear fresnel, etc.) and a novel heat exchanger that consists of thermoelectric generators which are capable of converting thermal gradients directly into electrical power. The high grade thermal energy produced will drive a compact absorption chilled water system and the low grade will be used for desiccant cooling and dehumidification using sea water.

Another promising solar cooling technology that researchers are exploring is desiccant technology which has become a valuable tool in the industry's arsenal of space – conditioning options. In certain cooling applications, desiccant cooling and dehumidification (solid or liquid) provide important advantages, for example, desiccant units do not require ozone-depleting refrigerants, and they can use natural gas, solar thermal energy, or waste heat, thus lowering peak electric demand. The principle of liquid desiccant cooling is that a hygroscopic liquid is brought into contact with air, in a device called a dehumidifier. The air becomes drier and this tends to increase its comfort value. As a result, the use of desiccant cooling and dehumidification systems for building comfort conditioning has increased steadily during the past several years. GORD runs research programs to develop an efficient, solar- based desiccant system suitable for residential and commercial applications. The first system will be installed and tested in GORD's innovative park, i.e. the first smart eco demonstration house.

Although the running cost of solar cooling systems is small but high initial costs of these systems remain an obstacle for the widespread commercialisation of solar cooling technologies. There is an urgent need for research and development to overcome the constraints associated with local climate conditions and to provide evidence-based solutions and guidelines, for instance, at the present time; will thermally driven systems prove to be more competitive than electrically driven systems?. On the other hand, size and costs of desiccant equipment are gradually decreasing, which should lead to general acceptance by the market-place over time, and greater use of evaporative cooling in more humid regions for comfort cooling.

SOURCE: Gulf Times, 22 November 2012, By Dr Yousef al-Horr and Dr Esam Elsarraj, Gulf Organisation For Research & Development**,** **http://bit.ly/V8elio**

EUROPE AND CENTRAL ASIA

13- Strengthening National Refrigeration & Air-Conditioning (RAC) Associations in Eastern European and Central Asian Countries

27 November 2012 – Casale Monferrato: The Italian Centro Studi Galileo, the European Association of Refrigeration, Air-conditioning and Heat Pump Contractors (AREA) and the United Nations Environment Programme (UNEP) joined forces to strengthen national refrigeration & air-conditioning (RAC) associations in Eastern European and Central Asian countries.

During the first meeting day, Mr. Marco Buoni, Vice President of AREA and Technical Director of Centro Studi Galileo, and Mr. Kelvin Kelly, Training Director of UK-based company Business Edge trained the managers of national RAC associations from Armenia, Croatia, Kyrgyzstan, Macedonia FYR and Montenegro on all aspects of the management of national RAC associations. Starting from the rational of creating and operating national RAC associations and a step-by-step approach on how to create such associations and to ensure their sustained financing, the participants discussed in detail the recruitment of members and how to defend their business interests, cooperation with stakeholder at national, regional and international level and the type of services to be provided to the members in terms of training, events and information services. The importance of effective outreach and media work was highlighted and demonstrated though the warm welcome by the Major of the "Italian Capital of Refrigeration" and the article placed on the cover page of today's Il Monferrato newsletter. The second meeting day will prepare the participants for the UK assessment under the European Union F-gas regulation which will take place during the last meeting day. Based on the discussions and presentations, it is planned to produce a fact sheet on how to create and operate national RAC associations to be shared with countries in other regions.

Contact:

Marco Buoni, Centro Studi Galileo, **buoni@centrogalileo.it**
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14- Strategy for Disposal and Destruction of ODSs for LVC Countries in the ECA Region

The Ministry of Environment of Czech Republic, the OzonAction Programme of UNEP's Division on Technology, Industry & Economics, United Nations Industrial Development Organization (UNIDO) in cooperation with Research Center for Toxic Compounds in the Environment (RECETOX) has organized the meeting on Review and Finalization of the draft Strategy for disposal and destruction of ODSs for LVC countries in the ECA region which is currently taking place in Brno, the Czech Republic on 26 – 28 November of 2012.

The meeting is part of the project preparation "Strategy for disposal and destruction of ODS for 4 LVC countries in the Europe and Central Asia region (Bosnia and Herzegovina, Croatia, Montenegro and Turkmenistan)" which was approved at 65th Meeting of the Executive Committee of the Multilateral Fund in November of 2011. The main objective of the regional meeting is to discuss, review and finalize of the draft Strategy for disposal and destruction of ODSs for LVC countries in the ECA region.

The meeting has also the goal to serve as capacity building activities which assist countries in introduction of policy and other measures which can help improving maintenance and end-of-life disposal of refrigeration and air conditioning equipment and introduction of procedures for environment sound management of ODSs. On Tuesday, 27 of November of 2012, participants visited the incineration facility in Ostrava which is one of the most advanced hazardous waste incinerator in the Central Europe (it has a permit to incinerate wastes containing PCB and Freon) in order to acquire the knowledge and experiences regarding economic, financial, technical, health, environment aspects of the destruction.

The participants include NOU officers and national experts participating in the collection of the data which serves as a basis for development the project's strategy to address stocks of unwanted ODSs in Bosnia and Herzegovina, Croatia and Montenegro. Representatives of implementing agencies (UNEP and UNIDO) and resource persons (Czech Republic) participated in the meeting and delivered a number of presentations.
Contact: Mikheil Tushishvili, Programme Officer, OzonAction Branch, Tel +33(0)144 3714 71,
mikheil.tushishvili@unep.org

15- La Guardia Civil desmantela una red que comercializa gas ilegal en Canarias

Los agentes del Instituto Armado precintaron un centenar de botellas con refrigerantes que dañan la capa de ozono

LAS PALMAS DE GRAN CANARIA - La Guardia Civil llevó a cabo ayer la primera fase de una operación contra la comercialización de gases ilegales en el Puerto de la Luz y de Las Palmas en la que se realizaron varias entradas y registros en distintas empresas, se precintaron al menos un centenar de bombonas con gases cuya comercialización está prohibida dentro de la Unión Europea y se llevaron a cabo al menos dos detenciones.
Una cincuentena de agentes del Seprona, de la Policía Judicial, de la Unidad Central Operativa Medioambiental (Ucoma) y del Servicio de Información de la Guardia Civil (SIGC) levantaron cierto revuelo por el Puerto de la Luz tras desperdigarse ayer a primera hora de la mañana por varias zonas. Los miembros de la Benemérita llevaron a cabo tres entradas y registros en las naves industriales de dos empresas que presuntamente compran y venden gases ilegales, entre ellos el R-22, uno cuya comercialización fue prohibida en la Unión Europea por dañar la capa de ozono.
Las naves que fueron registradas por los miembros de la Guardia Civil, en una operación coordinada por un juzgado de instrucción de Las Palmas de Gran Canaria que lleva varios meses investigando estas prácticas presuntamente delictivas, pertenecen a Servicios Navales Molina Sernamol S. L. y a Gases Industriales Fricom JGG S.L.
En la nave industrial de Sernamol, situada en la intersección de la Avenida de las Petrolíferas con la calle Ibarra y Compañía los agentes comenzaron entrando en la oficina para analizar la documentación relativa a los gases que comercializa. Otra docena de agentes se dedicaron a precintar las diferentes bombonas que contenían clorodifluorometano, un gas comúnmente conocido como R-22 que se utiliza como agente refrigerante para diversos equipos de refrigeración y de aire acondicionado, entre ellos los de algunos barcos.
Su uso fue prohibido en España, siguiendo las directrices marcadas por la Unión Europea, en enero de 2010 y su paulatina sustitución por otros gases que no destruyen la capa de ozono ha provocado que su valor en el mercado crezca exponencialmente ya que aún existen viejos sistemas que lo necesitan para funcionar.
En las instalaciones de Sernamol, una empresa que se dedica a la reparación de buques, al suministro de efectos navales y a la venta de diversos gases, los agentes del Instituto Armado precintaron varios pequeños almacenes que contenían unas 60 bombonas de R-22 y se llevaron diversa documentación en cajas. Antes de volver a la Comandancia de la Guardia Civil, pasadas ya las dos de la tarde, trasladaron una botella de 100 kilogramos del gas para analizar su contenido.
SOURCE: La Opinion, 29 Noviembre2012, BORJA VALCARCE, **http://bit.ly/118TVlo**

FEATURED

Ozone Secretariat Highlights >>> http://ozone.unmfs.org/new_site/en/index.php

> Documents of the **24th Meeting of the Parties to the Montreal Protocol**, Geneva, Switzerland, 12 - 16 November 2012. **http://conf.montreal-protocol.org/meeting/mop/mop-24/presession/default.aspx**

> **TEAP/TOCS Meetings –** Dates and Venues for 2012 @ **http://bit.ly/xIwkgj**
> **Addendum to TEAP May 2012 Progress Report (Vol.1) - Additional Information for China Essential Use Nomination 2013**
> **TEAP May 2012 Progress Report (Vol.1) - Corrigendum 1**
> **TEAP May 2012 Decision XXIII/9 Task Force Report (vol. 2) - Corrigendum 1**

The Multilateral Fund for the Implementation of the Montreal Protocol >>> http://www.multilateralfund.org

> **The 68th Meeting of the Executive Committee** 3-7 December 2012, Montreal, Canada. Click the following link to access agenda and related documents: **http://www.multilateralfund.org/68/default.aspx**

> **Funding Success - the Multilateral Fund Celebrates 25 Years of the Montreal Protocol**
The Multilateral Fund for the Implementation of the Montreal Protocol removed financial barriers that might have discouraged developing countries to accede to the Montreal Protocol.. **Read more**

Highlights from OzonAction >>> http://www.unep.org/ozonaction/

> **Follow OzonAction on**

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> **VIDEO: Protecting Our Atmosphere for Generations to Come: 25 Years of the Montreal Protocol**

> **Ozone statue unveiled in Vienna to mark Montreal Protocol anniversary -** As part of the ongoing celebrations to mark the 25 th anniversary of one of the world's most successful environmental agreements, a statue dedicated to protecting the ozone layer was officially unveiled today at the Vienna International Centre in Vienna. **Read more**

> **Achieving climate benefit through smart technology choices**
Alternatives to HCFCs in the Foam Sector: Taking on the Challenge » is a 15 min short documentary developed by UNEP OzonAction Branch that seeks out answers from the technical and scientific experts closest to the issue and showcases some inspiring conversion projects. **Read more**

> **Montreal Protocol e-Learning Module -** UNEP DTIE's OzonAction Branch and the World Customs Organization collaborated to develop the Montreal Protocol e-learning module. This interactive online training module, based on UNEP's Training Manual for Customs Officers, presents the latest information on the international policy governing the control and monitoring of Ozone Depleting Substances, as well as an overview of the technical issues including new information on chemicals and products traded and how these may be smuggled.
The module is periodically updated to take into account the developments in international trade and provides new material to reflect the changes in the Montreal Protocol, the Harmonised Systems codes, licensing systems and other relevant information. Once registered, users of the Montreal Protocol e-learning module can follow the course at their own pace and obtain a certificate after successfully completing it. The module is also ideal as an introductory course prior to attending UNEP's Customs training workshops and is also a great refresher course for experienced officers. **Ho w to register -** *Customs and Enforcement officers:* contact your country's national coordinator for the World Customs Organization to register: http://e-learning.wcoomd.org/hosting/Learning/Coordinators.pdf or contact the WCO E-learning team: elearning@wcoomd.org
National Ozone Officers who wish to use the course: *Contact your UNEP OzonAction Regional Office.*

> **Trends Analysis Updated -** Consumption and production of ozone depleting substances in developing countries have been updated and include the data for 2010 (CFCs, halons, methyl bromide and HCFCs).

The data can be accessed via > http://bit.ly/w1pqBC

> **UNEP/DTIE OzonAction Programme - Schedule of Events**

READING >>>

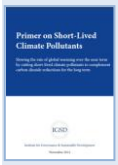
> **The Montreal Protocol and the Green Economy**
The Montreal Protocol offers a good example of how international cooperation in solving a global environmental problem can have significant spill over benefits that promote a Greener Economy.
Click here to read/ Download publication

> **Protecting our atmosphere for generations to come, 25 years of the Montreal Protocol -** The OzonAction Special Issue (OASI) features articles from international experts on many important issues including the celebrations of 25 years of the Montreal Protocol. A special issue dedicated to stratospheric ozone and climate change related issues and the implementation of the Montreal Protocol, providing the most recent information on ozone protection activities from industry, governments, NGOs and international organizations. Read/Download

Vital Ozone Graphics, Third Edition: For the 25th Anniversary of the Montreal Protocol, the vital ozone graphics have been updated to reflect the most recent data and information particularly the data reported by the Parties up to and including 2011… Click the links below for:
Launch @ MOP24 **photos** | **download pdf** | **view in e-book format**

> UNEP-IIR-CS: Launch the "**International Special Issue 2012-13 on the 25th Anniversary of the Montreal Protocol**", **Read/ Download** / **Click here** to see pictures of the launch event

> **Strengthening Ambition for Climate Mitigation: The Role of the Montreal Protocol in Reducing Short-lived Climate Pollutants -** Durwood Zaelke, Stephen O. Andersen, Nathan Borgford-Parnell. Review of European Community & International Environmental Law
Volume 21, Issue 3, pages 231–242, November 2012



Primer on Short-Lived Climate Pollutants - This report provides a summary of short-lived climate pollutants (SLCPs), including: an introduction to SLCPs; explanation of the co-benefits of reducing SLCPs with respect to climate, human health and food security; and a menu of mitigation options for reducing SLCPs, including international and regional initiatives, such as the Climate and Clean Air Coalition (CCAC). Institute for Governance and Sustainable Development (IGSD), 2012.
Download/Read

> **Guide to Flammable Refrigerants** Prepared by Cool Concerns Ltd at the request of the Council of the British Refrigeration Association (BRA), the Guide seeks to provide impartial information about the flammability issues associated with hydrocarbons and flammable HFC refrigerants to end users, specifiers, building owners, manufacturers and contractors. The publication, covering the use of flammable refrigerants in new, specially designed systems, is an introduction to flammable refrigerants and signposts where interested parties can obtain more detailed information. **Read/Download**

The GUIDE 2012: Natural Refrigerants - Market Growth for Europe" published as the first-ever guide to the market potential for the natural working fluids carbon dioxide (CO2), ammonia (NH3) and the group of hydrocarbons. It addresses both natural refrigerant (NR) experts and new entrants to the market for more sustainable heating, cooling and refrigeration. It has heard the voices of close to 1,300 HVAC&R experts to project market conditions for NR over the coming years. .. **Click here** to Read/download *for free* from SHECCO website.

WMO Greenhouse Gas Bulletin - Excerpts:

…[*In the figure above, zonally averaged nitrous oxide (N2O) abundance from WMO/GAW air sampling sites is plotted as a function of latitude from 1980 to 2010. Nitrous oxide is now the third most important con-tributor to radiative forcing of long-lived greenhouse gases, recently surpassing CFC-12, and its impact on climate integrated over 100 years is 298 times greater than equal emissions of carbon dioxide (CO2). It plays an important role in stratospheric ozone (O3) destruc-tion. The major anthropogenic source of N2O to the atmosphere is the use of nitrogen containing fertilizers (including manure), which have profoundly affected the global nitrogen cycle. Reductions in the amounts of fertilizer applied to agricultural fields to better match the nitrogen needs of crops can reduce N2O emissions. Such changes must be made carefully to avoid lower crop yields, which would raise concerns about global food security. The predominant use of fertilizers in the mid-latitudes of the northern hemisphere is responsible for the small north-to-south gradient of ~1.2 ppb.*[1]]...

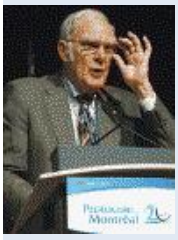
… [Other greenhouse gases

Sulphur hexafluoride (SF6) is a potent LLGHG controlled by the Kyoto Protocol to the United Nations Framework Convention on Climate Change. It is produced artificially and used as an electrical insulator in power distribution equipment. Its mixing ratio has increased to double that observed in the mid-1990s (Figure 6). The ozone-depleting chlorofluorocarbons (CFCs), together with minor halo-genated gases, contribute ~12%[3] to radiative forcing by LLGHGs. While CFCs and most halons are decreasing, hydrochlorofluorocarbons (HCFCs) and hydrofluorocar-bons (HFCs), which are also potent greenhouse gases, are increasing at rapid rates, although they are still low in abundance (Figure 7).

Tropospheric ozone has a relatively short lifetime. Its radiative forcing, however, appears to be comparable to that of the halocarbons, although much less certain. It is difficult to estimate the global distribution and trend of tropospheric ozone because of its uneven geographical distribution and high temporal variability. Many other pollutants, such as carbon monoxide, nitrogen oxides and volatile organic compounds, although insignificant as greenhouse gases, have an indirect effect on the radiative forcing through their impact on the tropospheric ozone abundance. Aerosols (suspended particulate matter) are also short-lived substances that influence radiative forcing.
All gases mentioned herein as well as aerosols are moni-tored by the GAW Programme, with support from WMO Member countries and contributing networks.]…

Read /Download: **http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html**
and
http://www.wmo.int/pages/prog/arep/gaw/ghg/documents/GHGbulletin_7_en.pdf

> **HC Trend in the Chemical Industry & Case Stories from Emerging Economies**
http://www.hydrocarbons21.com/news/view/3704



> **Frank Sherwood Rowland**

By : Stephen O. Andersen[1] and Marco Gonzalez[2]
[1] Montreal Protocol Technology and Economic Assessment Panel, Barnard, Vermont
[2] Montreal Protocol Ozone Secretariat, Nairobi, Kenya
View online: **http://dx.doi.org/10.1063/PT.3.1759**
View Table of Contents: **http://www.physicstoday.org/resource/1/PHTOAD/v65/i10**
Published by: The American Institute of Physics, October 2012, **http://bit.ly/TU3HRf**

MEETINGS / EVENTs >>>

- 2012 -

> **Dates and Venues of Montreal Protocol Meetings in 2012**

> **Technology Forum on Climate-Friendly Alternatives in Commercial Refrigeration**,

Montreal, Canada, 8 December 2012- Sponsored by the Climate and Clean Air Coalition (CCAC) - will provide information on the technical, financial and environmental aspects of some of the key low-GWP, energy-efficient alternative technologies that are available or emerging in the commercial refrigeration sector, in order to help assess their potential applicability in developing countries and build confidence that low-GWP refrigeration technology is commercially viable and already being used in different markets. In addition, the event will provide a forum for a dialogue among government representatives, international organizations, industry, technology users and technology providers, on the opportunities and challenges involved in successfully adopting such technologies in developing countries…
Click here to learn more

> Presentations during **ATMOsphere Geneva 2012**, 14 November, Geneva, Switzerland, are now available **Click here** to Read/Download

- 2013 -

> **The International Air-Conditioning, Heating, Refrigerating Expo**, held in conjunction with the Winter Conference, will run 28-30 January 2013. The Expo, **www.ahrexpo.com**, is held at the Dallas Convention Center.

> **First Announcement and Call for Papers – 5th International Conference**, **Ammonia Refrigeration Technology**, IIR Commissions: B2 with B1, D1. May 9-11, 2013, Ohrid, Republic of Macedonia, **Learn more > http://bit.ly/MOjcHD**

> **ATMOsphere America 2013** - THE BUSINESS CASE FOR NATURAL REFRIGERANTS IN NORTH AMERICA, 2nd edition, 17 - 19 June 2013, Washington DC, USA. **> http://bit.ly/X7DOEH**

> **Focuses on Research & Integrated Project Delivery: ASHRAE Announces Call for Papers for 2013 Annual Conference**, June 22-26, Denver, Colorado. The conference seeks papers on current research worldwide; core HVAC&R applications and systems; and, featured for this conference, Integrated Project Design, Energy Modeling and Building Efficiency Performance… To submit a conference paper abstract or a technical paper and for more information about the tracks **> www.ashrae.org/Denver**

MONTREAL PROTOCOL
WHO'S WHO

Have you visited the **Montreal Protocol Who's Who**?
http://www.unep.fr/ozonaction/montrealprotocolwhoswho/PageFlip.asp

Let's know what you think about this website !
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If you have questions or comments regarding any news item, please contact directly the source indicated at the bottom of each article.

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