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In this issue

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

GLOBAL

1. Eliminating HFCs Faster will Cut Climate Harm

Eliminating chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) from our refrigerators and air-conditioning units, thereby helping the ozone hole to heal, has been a global success story. But the hydrofluorocarbons (HFCs) used to replace CFCs and HCFCs are potent greenhouse gases. Now a study shows that early action to reduce HFCs could bring huge benefits, with more than 90% of the atmospheric impacts of HFCs avoided if they are phased out by 2030.

Although HFCs don't hang around in the atmosphere for as long as carbon dioxide, some can cause thousands of times more warming per kilogramme over the course of a few decades. Atmospheric emissions of HFCs are increasing rapidly, in response to rising global demand for technologies such as air conditioning and refrigeration.

However, the potential global warming hazard from HFC emissions has been recognised. Last October, at the 28th Meeting of the Parties to the Montreal Protocol, the Kigali Amendment to phase down HFCs was adopted by 197 countries. Under the amendment, countries committed to cut the production and consumption of HFCs by more than 80% over the next 30 years.

How much difference to climate will fast action to phase out HFCs make? To answer this question, Margaret Hurwitz from the NASA Goddard Space Flight Center, US, and her colleagues used coupled chemistry-climate models to quantify the relative contribution of HFCs to future atmospheric change, and the effects of different HFC mitigation scenarios.

The researchers looked at four hypothetical scenarios: one with business-as-usual emissions of all greenhouse gases, and three others where HFCs were phased out by 2020, 2030 and 2040 respectively, while all other greenhouse gases continued with business-as-usual emissions. In all cases, the team examined the change in surface radiative forcing and the temperature response in the upper troposphere and stratosphere between now and 2050.

The results clearly show that early action on HFCs could have a significant impact on global warming in the near-term, with more than 90% of the climate impacts of HFCs avoided if they are phased out by 2030.

"The climate impacts of increasing carbon dioxide are expected to be larger than those of the HFCs, but we show that reducing HFCs could make a substantive contribution to future atmospheric change," said Hurwitz, whose findings are published in Environmental Research Letters (ERL).

Phasing out HFC emissions as fast as possible can only be beneficial, but it won't necessarily be easy. It is possible to replace HFCs with compounds that have lesser climate impacts, or to adopt technologies such as water-cooling systems that don't rely on HFCs, but it may take some time to find solutions that can be implemented globally across a broad range of applications.

- Environmentalresearchweb, 28 March 2017

2. Report: Ozone Hole Has Shrunk by More Than Four Million Square Kilometers

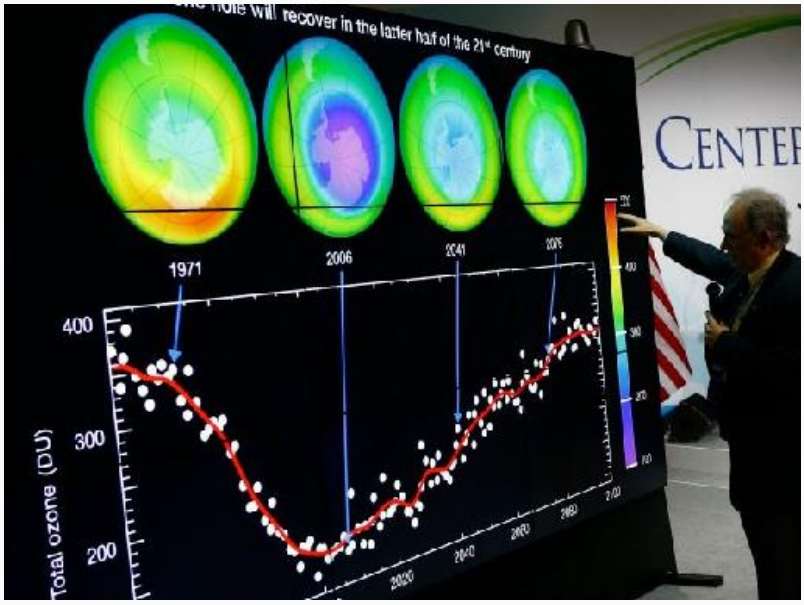
In the period from 2000-2015, the hole in the ozone layer shrank by more than 4 million square kilometers - nearly a billion acres - according to a new report in the journal Science.

During the 1980s and into the 1990s, news of a massive hole in the ozone layer caused worldwide panic, stoked by everything from rumors of sheep being blinded by increased atmospheric radiation to the fear of a skin cancer pandemic and even comparisons to “AIDS from the sky.”

Now scientists at MIT along with others have found that since 2000 the ozone hole has actually shrunk by an area half the size of the contiguous United States, although the process is also heavily affected by variables such as volcanic eruptions from year to year.

Bryan Johnson, a research chemist at the National Oceanic and Atmospheric Administration, has noted attention shifting over the years from one environmental concern to another.

“There are three phases to atmospheric concerns,” Johnson says. “First there was acid rain. Then it was the ozone hole. Now it’s greenhouse gases like CO_2.”



In reaction to fears over the ozone hole, most of the nations in the world agreed to the Montreal Protocol in 1987, which banned the use of chlorofluorocarbons (CFCs), which had been tied to the creation of the ozone hole.

The lead author of the recent study on the ozone layer believes that the reversal of the hole’s expansion is in large part a result of the Protocol.

“We can now be confident that the things we’ve done have put the planet on a path to heal,” said Susan Solomon, Professor of Atmospheric Chemistry and Climate Science at MIT. “We got rid of them, and now we’re seeing the planet respond.”

Just three years ago, scientists were predicting that the ozone hole would start shrinking “in about a decade,” but it turned out that the hole had already gotten considerably smaller than they realized.

In 2015, the ozone hole reached a record size, but Solomon and her colleagues discovered that the spike in ozone depletion was due primarily to the eruption of the Chilean volcano Calbuco.

- Breitbart, 28 March 2017, By: Thomas D. Williams, Ph.D.

3. El ozono medido en Marambio superó el valor de los 25 años anteriores e indica recuperación de la capa


© LA NACION El ozono medido en Marambio superó el valor de los 25 años anteriores e indica recuperación de la capa

En una de las atmósferas más puras que existen, Argentina mide la capa de ozono en el Pabellón Científico de la base antártica Marambio, en un proyecto conjunto con Finlandia que registró valores superiores a los anteriores 25 años, lo que indica que "la capa de ozono se recupera" por rectificación de la acción humana que la había deteriorado.

"El 21 de enero tuvimos una medición de ozono en la que el valor supera ampliamente el promedio de todas las mediciones realizadas en Marambio entre 1989 y 2016", cuenta el meteorólogo Marcos Moreno en una entrevista durante la estadía que Télam mantiene en la base antártica asistida por la Fuerza Aérea Argentina.

El ozono es un gas que se forma en la atmósfera estableciendo una capa que bloquea la radiación solar ultravioleta dañina (UV-C), que incrementa el riesgo de cáncer de piel y daña al fitoplancton de los mares, entre otros perjuicios.

Si se comprimiera alrededor de la atmósfera todo el ozono disponible, la capa formada mediría tres milímetros, denominada 300 unidades de Dobson en referencia al científico inglés que ideó el método de medición. Son suficientes e imprescindibles para absorber la mayor parte de la radiación ultravioleta UV-C.

La capa había resultado gravemente dañada por el uso de aerosoles refrigerantes luego prohibidos, que alteraron el ozono como daño colateral.

Inventada para ser usada en refrigeración, la molécula de clorofluorcarbono (CFC) empezó a agotar el ozono natural presente en la alta atmósfera y produjo una disminución que fue observada en 1974 por Mario Molina y Frank Sherwood Rowland, en un trabajo que les significó el Nobel de Química 1995 junto a Paul Crutzen.

Una década después de esa observación, el servicio antártico británico publicó en 1985 el estudio que mostraba

una disminución alarmante de la capa en la región polar, el "agujero de ozono" por el cual una veintena de países, entre los que se contaban productores de CFC, suscribieron el Protocolo de Montreal que entró en vigencia en 1989.

"En los últimos tiempos estamos viendo que hay una mejora en esa capa de ozono que va de la mano con el Protocolo de Montreal: se está comprobando que el hombre, poniéndose de acuerdo, puede llegar a mejorar lo que el mismo hombre deterioró", balancea Moreno.

"Por una serie de mediciones que estamos comparando con la histórica que tenemos del ?89, nos estamos dando cuenta de que la capa de ozono está recuperando valores" que indican que el adelgazamiento sobre la Antártida comenzó a revertirse, planteó.

"Estimamos que para el 2050 debería estar en los valores previos al uso del CFC y todos los aerosoles que destruyen el ozono, lo que significa que el hombre puede alterar su comportamiento, y ese comportamiento, cuando nos ponemos de acuerdo sin distinción de bandera, credo, religión, tiene repercusión en el medio ambiente", enfatizó.

Junto al técnico del área electrónica Marco Albertini, la tarea de Moreno está abocada a la medición del ozono con dos métodos, óptico y químico, además de estudios complementarios de aerosoles y partículas en la atmósfera.

"A través del espectrofotómetro de Dobson se hace la descomposición de la luz solar que recibimos a nivel superficial, medimos una longitud de un par de onda que es alterada por el ozono y otro par que no lo es, y por comparación en un software sale una unidad de medida que estima el ancho de la capa de ozono", detalla Moreno.

A nivel internacional se considera que por debajo de 200 unidades Dobson se está dentro del "agujero de ozono", lo que normalmente se da en la primavera antártica. La medición que pudo observar Télam dio 258 unidades Dobson.

El método químico requiere el lanzamiento de una ozono sonda a la atmósfera, un enorme globo de dos metros de diámetro inflado con Helio que toma cada segundo muestras de aire. Ese aire reacciona con una solución salina que genera una corriente transmitida por radiofrecuencia a un software, lo que permite medir la cantidad de ozono a medida que la sonda va ascendiendo hacia los 30.000 metros.

El Pabellón Científico es propiedad del Servicio Meteorológico Nacional y comparte espacio con la Dirección Nacional del Antártico y el Laboratorio Multidisciplinario de Marambio, que miden el ozono con un tercer método, el sistema Brewer automatizado.

Medir el ozono en Marambio es importante por la ubicación geográfica en la que está la Base, prácticamente en la periferia del evento "agujero de ozono", obteniendo valores de ozono dentro y fuera del "agujero".

Alrededor del Continente Antártico se da el fenómeno "vórtice polar", que consiste en centros de baja presión que no permiten el intercambio de masas de aire entre el interior y el exterior del evento.

Albertini relata que "en 2012, Finlandia concretó un proyecto con el Servicio Meteorológico para ampliar con un laboratorio de aerosoles el estudio de gases de efecto invernadero, black carbón (smog) y radiación UV-B (la que produce el bronceado y penetra la epidermis)".

Moreno considera que "científicamente es importantísimo medir estas fluctuaciones, conocer el centro donde supuestamente está el 'agujero de ozono', saber si estamos dentro o fuera de estas 200 unidades Dobson que se toman como límite".

"La medición constante no sólo repercute en la vida diaria de las personas, sino que medir el ozono acá es medirlo en una de las atmósferas más puras que existen, porque hay muy poca actividad humana que pueda llegar a alterar" el registro.

El meteorólogo sostiene que "el hombre es el que generó esta disminución en la capa de ozono, pero también el hombre está cambiando ese comportamiento de destrucción con la conducta de reemplazar ciertos componentes químicos por otros".

- MSN Noticias, Agencia Télam, Marzo 2017

4. Sustainable Management of Refrigeration Technologies in Marine and Off-Shore Fisheries Sectors, 6-8 April 2017, Bangkok, Thailand

Pre-registration is Now Open

Read/download/ *Program Book*

Organized by the UN Environment (UNEP), ASHRAE, the International Institute of Refrigeration (IIR), and the United Nations Industrial Development Organisation (UNIDO), with the kind support of the Government of the Kingdom of Thailand and the Department of Industrial Works, the Sustainable Management of Refrigeration Technologies in Marine and Off-Shore Fisheries Sectors Conference takes place April 6-8, 2017, in Bangkok, Thailand.

Refrigeration technologies are essential for the cold food chain management both on land and in marine applications. The Montreal Protocol (Protocol) Technology and Economic Assessment Panel (TEAP) reported that 80% of mobile marine refrigerated systems use hydrochlorofluorocarbons-22 (HCFC-22) refrigerants. HCFC-22 is currently being phased-out worldwide under the Montreal Protocol on Substances that Deplete the Ozone Layer.

RAC technology management in the mobile marine and fisheries sector has a critical role in meeting the phase out targets specified by the Meeting of the Parties (MOP) to the Protocol and ensuring sustainable environmental practices in their RAC applications. Refrigeration, freezing, ice making and air-conditioning equipment are fundamental for mobile marine and fishery operations as well as sustaining economic livelihoods.

This international conference will focus on the practices of this industry in the management of existing systems, longer term energy efficient systems, advancement and selection of related refrigeration and air-conditioning (RAC) technologies. In keeping with the ongoing developments of the Montreal Protocol, the conference will address the different aspects, mentioned earlier, in conjunction with eliminating/minimizing the use of either hydrochlorofluorocarbons (HCFC) or high-GWP hydrofluorocarbons (HFC), as refrigerants, and the relevant obligations under the Montreal Protocol as well as other international policies and governing treaties.

Learn more

On-line pre-registration is now open:

1. Go to page: https://www.ashrae.org/membership--conferences/conferences/ashrae-conferences/marine-2017

2. Scan down and you will see: Registration Application: https://fs12.formsite.com/ashrae/form32/index.html

AFRICA

5. African Ozone Officers Meet to Discuss HCFC Phase-out and Kigali Amendment

Abidjan, Cote d'Ivoire, 24 March 2017 – Fifty National Ozone Officers from the English-speaking and French-speaking African Network countries gathered in Abidjan from 20-24 March 2017 to review and address challenges related to the phase-out of HCFCs and their national Montreal Protocol activities as well as to discuss strategic frameworks and plans of action for hydrofluorocarbons (HFC) phase-down.

With the recent adoption of the Kigali Amendment to the Montreal Protocol which commits Parties to phase down the consumption and production of HFCs, meeting participants included, regional and international experts from the Secretariat of the Multilateral Fund, the Ozone Secretariat, United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO), United Nations Environment (UNEP), and external partners from Ghana Energy Commission, International Energy Agency (IEA), International Copper Association (ICA), and refrigeration and air-conditioning associations.

The meeting was officially opened by H. E. Madame Anne Désirée Ouloto, Ministère de la Salubrité, de

l'Environnement et du Développement Durable, République de Côte d'Ivoire, who urged the participants to ratify the Kigali Amendment by the end of 2017.

Ms. Juliette Biao Koudenoukpo, Director and Regional Representative, Africa Office, UN Environment encouraged the participants to continue with their efforts to meet their countries' obligations under the Montreal Protocol.

The countries reviewed the status of implementation of national surveys for ozone depleting substances (ODS) alternatives, and committed to specific dates for submission of their final reports. The meeting discussed how African network countries will meet their 2020 control measures for HCFCs while addressing technological challenges related to different sectors. The meeting demonstrated the Multilateral Fund's online Country Programme data reporting platform, discussed climate co-benefits of the ODS phase-out, energy efficient issues and how UN Environment and the countries can provide capacity building, support and guidance to RAC technicians.

Mr. Kofi Agyarko, Head, Energy Commission, Ghana, presented the first African Refrigerator Market Transformation programme, where 10,000 used and energy-inefficient refrigerating appliances were exchanged for the same number of new and more efficient ones, resulting in average consumer energy savings of 850kWh and US$ 120/year. He explained the importance of good cooperation between the Energy Commission and Ghana National Ozone Unit which contributed to attaining this historic achievement.

The meeting, organised by UN Environment OzonAction in collaboration with the Government of Côte d'Ivoire, is part of the Regional Network service that OzonAction Compliance Assistance Programme (CAP) provides to Article 5 (developing) countries as part of its role as an Implementing Agency of the Multilateral Fund for the Implementation of the Montreal Protocol.

- **Contact:**

  Yamar Guissé, Regional Network Coordinator for French-speaking Africa, OzonAction, UN Environment

  Patrick Salifu, Regional Network Coordinator for English-speaking Africa, OzonAction, UN Environment

- UN Environment, OzonAction, 24 March 2017

See also: Protection de la couche d`ozone: ouverture de la 20ème réunion des coordonnateurs en charge du programme Ozone en Afrique, Abidjan, Côte d'Ivoire, 20-24 mars 2017, AbidjanNet, 21 mars 2017

ASIA PACIFIC

6. Green Customs Gains Ground in Pakistan

Karachi and Lahore, 13-18 March 2017: Within the walls of the 107 years old building of Karachi Port Trust (KPT) - Pakistan's federal agency overseeing the port operations since 1887, the "Train-the-Trainers Workshop for Enforcement Officers on Monitoring and Control of the Trade of Ozone-Depleting Substances (ODS)" was organized to equip enforcement officers with knowledge and skills to implement the Montreal Protocol on Substances that Deplete the Ozone Layer specifically in view of the recently agreed Kigali Amendment on phase down of HFCs. A second workshop was held for Customs Officers from Punjab in Lahore.

The two workshops were organized by the Ozone Cell of Pakistan's Ministry of Climate Change and the Directorate General of Training and Research (Customs) with support from the UN Environment (UNEP) Economy Division, OzonAction, Regional Office for Asia and the Pacific.

"The objective of workshop is to build the capacity of a number of enforcement officers in Pakistan, mainly from the Customs department of Karachi which is the biggest and main port of Pakistan and Lahore to prepare them for the nationwide training programme. The national training, meanwhile, is aimed at strengthening Pakistani enforcement officers to monitor and control trade in HCFCs efficiently, especially until 2020 when the government of Pakistan has committed to phase out 35% of HCFC-consumption under the Montreal Protocol on Substances that Deplete the Ozone Layer," stated Mr. Atul Bagai, Senior Regional Coordinator of UNEP OzonAction.

Around 40 participants representing the Customs and Enforcement Departments of Pakistan such as the Ministry of Climate Change, General Customs Administration, Customs Divisions and Points, Customs Training Centre and Customs Central Laboratory, Frontier Core and Pakistan Standards and Quality Control Authority attended the training.

As an Article 5 country, Pakistan has committed to phase-out HCFCs and other ozone-depleting chemicals following an agreed timetable under the Montreal Protocol. Decision XIX/6 of the Meeting of the Parties in 2007 accelerated the phase-out schedule of HCFCs – which means Pakistan needs to freeze importation of HCFCs baseline consumption (2009-2010 average) by 1 January 2013 and to reduce consumption by 10% by 1 January 2015. Having met these targets, this training will gear up the country to meet the 2020 targets and also understand the implications of the recently agreed Kigali Amendment for phase down of HFCs.

"Now, it is time phase out of HCFCs and allied substances which deplete the ozone layer. To prepare the Customs enforcement staff for this purpose, this workshop has been organized with very active support of Ozone Cell, Ministry Of Climate Change, Government of Pakistan and UNEP to create a pool of Master Trainers and also to share knowhow with the allied agencies like Frontier Corps, Anti-Narcotic Force, Maritime Security Agency and Pakistan Standard and Quality Control Authority (PSQCA), who would be cooperating at various levels with Pakistan Customs," said Mr. Iftikharuddin Gilani, Joint Secretary, Ministry of Climate Change, Islamabad.

"Since Pakistan Customs has well established training centres with latest facilities, the Master Trainers will soon start training other staff through workshops at DGTR Karachi, Lahore and Islamabad. However FBR will look forward to continued support of the Ozone Cell and UNEP which will push the given objectives further," Ms. Rubina Wasti, Director General, DGTR Karachi added.

Pakistan has had an operational licensing and quota system for import and export of ODS since 2000, and this system is also applicable to HCFCs. Pakistan has also put in place the control of the import of ODS-based

equipment including HCFC-based equipment and the customs duty on components or sub-components related to the refrigeration, air conditioning was exempted for non-CFC or non-HCFC gases. However, there is a need to strengthen control and build the capacity of Customs officers and other key stakeholders, including Ministry of Commerce, responsible in issuing the import licenses to enforce the system, and ensure that illegal trade of HCFCs is prevented.

Contact:

Zaigham Abbas, National Project Manager, Ozone Unit, Ministry of Climate Change

Atul Bagai, Senior Regional Network Coordinator, OzonAction, UN Environment, Asia and the Pacific

7. India Launches Stage II of HCFC Phase Out Management Plan (HPMP)

Urging the industry to develop unique products to carve out a niche for India at the global level, the Environment Minister, Shri Anil Madhav Dave, has said that companies must invest a part of their income into research & development (R&D) and do some out-of-the-box thinking. "If money can be invested into Corporate Social Responsibility (CSR), money should also be invested into research to develop unique products that can be used in the future," the Minister added. Shri Dave pointed out that India is by nature, a land of researchers and the likes of Aryabhatt and Ramanuj are sons of soil and in our blood. "The only thing we need to do is to create an atmosphere and pull out the resources", he said.

Delivering the inaugural address at the launch of Stage-II of Phase Out Management Plan of Hydrochlorofluorocarbons (HPMP) here today, the Minister underlined the need to create the necessary skills and generate employment too. Recalling the Prime Minister, Shri Narendra Modi's inspiring ideal of doing the nation proud at international fora, Shri Dave added that the Government will never compromise the environmental interests of India at international negotiations and at the same time, also keep in mind the welfare of the world.

Recalling the success during negotiations at Kigali as a turning point and a success for India, the Environment Minister pointed out that the interests of the nation were always kept in mind. "Just like a captain of the ship keeps a vigil on the compass to check that the ship is sailing in the right direction, I never took my eyes off the compass" (of India's interests).

A document on the HCFC Phase-Out Management Plan Stage-II was also released to mark the occasion.

In his keynote address, Secretary, Ministry of Environment, Forest and Climate Change, Shri A.N Jha, said that the challenge is how to move fast, in keeping with the changes and to push R&D. He said that three separate agencies have been set up – Technology & Economic Assessment Panel (TEAP), Scientific Assessment Panel (SAP) and Environmental Effects Assessment Panel (EEAP). Special Secretary, MoEF&CC, Shri R.R. Rashmi emphasised that this is a critical stage of the HCFC phase out and that much larger involvement of the industry is needed. He also expressed the hope that the industry will help in making the transition efficiently. Joint Secretary, MoEF&CC, Shri Manoj Kumar Singh said that 2017 marks the 30th anniversary of Montreal Protocol. He also underlined that more than 98% Ozone Depleting Substances (ODS) have been deleted. Joint Director, MoEF&CC, Shri Amit Love gave the vote of thanks. Managing Director, Gujarat Fluorochemicals, Shri V.K Jain and Managing Director, SRF Limited, Shri Ashish Bharat Ram also spoke on the occasion.

The Stakeholders' meeting discussed the implementation of HPMP Stage II, the Kigali Amendment to the Montreal Protocol for phase down of Hydrofluorocarbons (HFCs) and the post-Kigali developments. India has been a strong advocate of the principle of Common But Differentiated Responsibility (CBDR) in the matter of global actions to protect environment and also that national circumstances need to be factored in for arriving at any durable agreement related to climate. In Kigali, India was able to pilot and secure an agreement that provides adequate space for growth of our economy, while providing adequate time for industry to shift to sustainable alternatives in the interest of environment. The agreed arrangements minimize the cost to consumers in transitioning away from HFCs and provide for domestic innovation to develop in the sector of new generation

refrigerants and related technologies.

Under HPMP-II, India has secured 44.1 million USD from the Multilateral Fund for the Implementation of the Montreal Protocol for phasing out 8,190 MT or 769.49 ODP tonne of HCFC consumption between 2017 to 2023, in order to meet the compliance targets under Montreal Protocol for 2020. More than 400 enterprises, including 300+ Micro, Small and Medium Enterprises (MSMEs) in the foam manufacturing sector and 6 large air-conditioning manufacturing enterprises will be supported under HPMP-II for conversion from HCFCs to non-HCFC technologies.

The HPMP II also provides for promotion of energy efficiency, development building codes integrating HCFC phase out issues, cold chain development with non-HCFC alternatives and development of standards for new non-ODS and low GWP alternatives, while transitioning away from HCFCs. It is expected that there would be a net direct CO_2-equivalent emission reductions of about 8.5 million metric tonne annually from 2023. It also specifically focusses on the MSME sector in foam manufacturing. Adequate attention has also been given to synergize the Refrigeration and Servicing (RAC) servicing sector trainings under HPMP II, with the Skill India Mission, in order to multiply the impact of skilling and training. According to estimates, nearly, 16, 000 service technicians will be trained under HPMP-II.

Under the Montreal Protocol, the accelerated phase out of Hydrochlorofluorcarbons (HCFCs) is underway with a phase out of HCFCs by 2030. HCFCs presently are being used in various sectors, *inter alia* including Refrigeration and Air conditioning (RAC) sector, foam manufacturing sector etc. These sectors, as such, are cross-cutting and are directly related to sectors such as urban development, agriculture through cold chain sector, and industrial development. India is undertaking phase-out of HCFCs through the implementation of HCFC Phase-out Management Plan (HPMP). The HPMP Stage-I has been already implemented in the country and has successfully met all the ODS phase-out targets, including those of HPMP Stage-I.

The transition from HCFCs to environment-friendly, technically proven and economically viable alternatives is a challenging task particularly for a developing country. India has voluntarily followed a low carbon development path, while phasing out HCFCs by adopting non-ODS, low Global Warming Potential (GWP) and energy-efficient technologies in its HPMP, which is unlike growth paths taken by many countries in the developed world. The HPMP has been developed in a manner that industrial obsolescence and adverse economic impacts to the industry are minimized and the compliance targets of the Montreal Protocol are achieved.

In the last three decades, the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer have achieved universal ratification of the 197 member countries of the United Nations. The extraordinary international cooperation of Parties to the Montreal Protocol has led to the phase-out of production and consumption of more than 95 % of Ozone Depleting Substances (ODSs), and has also contributed significantly towards protection of the global climate system.

Among those present at today's stakeholder meeting were officers of the Ministries and Organizations of the Central Government, State Governments, representatives from industries, stakeholders including NGOs and implementing agencies associated with the implementation of the HPMP II viz. representatives from United Nations Development Project (UNDP), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and United Nations Environment Project (UNEP) were also present on the occasion.

- PibNic, March 2017
- See also India launches second stage of HCFCs phase-out plans, The Financial Express, 6 March 2017

8. Reinforcing the Capacity of Cambodian National Trainers in the Installation and Servicing of Ozone- and Climate-friendly Refrigerants in Room Air-conditioners

Guangzhou, 13 March 2017 – UN Environment, OzonAction facilitated the Training Workshop on Good Practices for the Installation and Maintenance of R-290 Room Air-conditioners, held at the Guangzhou, China, which has reinforced the capacities of Cambodian national trainers to follow good practices in the handling of the ozone- and climate-friendly refrigerant; R-290.

The three-day training workshop from 13-15 March 2017 was jointly organised with China's Foreign Economic Cooperation Office of Ministry of Environmental Protection, China's Ministry of Human Resources Social Security and China Workers' Education and Vocational Training Association at Guangzhou Industry & Trade Technician College (GZITTC), the training center that is recognised as having the best facility for vocational training in China. The training workshop was attended by 20 national trainers from Cambodia, who will transfer knowledge and skills to local technicians under the on-going HCFC Phase-out Management Plan.

The Kigali Amendment has committed all countries to time-bound reductions in the use of hydroflurocarbons (HFCs) – the powerful greenhouse gases that are replacing ozone-depleting hydrochlorofluorocarbons (HCFCs) which are mainly used in the refrigeration and air-conditioning sector and are being phased out under the three-decade-old Montreal Protocol.

"This is the time for Parties to the Montreal Protocol including Cambodia to work together with the others not only to phase-out the ozone depleting substances, but also to leapfrog powerful HFCs greenhouse gases. Most of available climate-friendly alternatives are flammable refrigerants, it is essential to provide updated training to the technicians to enable them to follow the good practices for safe installation and servicing of equipment using flammable refrigerant", said Mr. Heng Nareth, Director General, General Directorate of Environmental Protection, Cambodia's Ministry of Environment.

"China has chosen R-290 as alternatives in the room air-conditioner sector as it has a very low global warming potential (GWP), therefore it is perceived as a longer-term solution to HCFCs. To address its flammability issue, China has being continuingly conducting training to local technicians to properly follow the good practices for the safe installation and servicing of R-290 room air-conditioners. China is willing to assist Cambodia to be prepared for the adoption of this technology", said Mr. Xiao Xuezhi, Deputy Director General of China's Foreign Economic Cooperation Office.

The training workshop comprised a one-day theoretical session and two days of practical sessions. The practical session comprising brazing, 'lokring' connection, installation, evacuation, refrigerant charging and leak testing was conducted using R-290 air-conditioner sand equipment/tools specifically designed for R-290 under close supervision and guidance of experienced trainers and GZITTC's trainers who received an award from the *World Skill Competition*. An on site visit to the TCL Company, a manufacturer of R-290 room air-conditioners, was organised on 16 March 2017 to help enhance understanding of the trainers on the safety measures in the charging area of an air-conditioner production line. In the margins of the training workshop, both countries also discussed and explored the potential collaboration in the area of vocational training.

"Many developing countries including Cambodia still do not have proper servicing equipment and tools for conducting training in the safe handling of flammable refrigerant in room air-conditioners. This training workshop enabled the national trainers to access the necessary servicing equipment and tools, and to have a real experience working with an R-290 unit. The UN Environment Compliance Assistance Programme (CAP) will further facilitate this excellent model of south-south cooperation including with other regions", said Dr. Shamila Nair-Bedouelle, Head of OzonAction, UN Environment.

"It was a great opportunity to be trained in this event. The training facility is very well equipped and all the Cambodian participants are very much enjoying the training. We have gained new knowledge and techniques from the trainers. This is definitely useful for Cambodian trainers and we will transfer knowledge/skills to other colleagues and students. We look forward to having the opportunity for training on any new developments in the future", said Mr. Von Vanna, a Cambodian participant.

Contact:

Pak Sokharavuth, National Ozone Officer, Ministry of Environment Cambodia

Shaofeng Hu, Regional Network Coordinator (SEAP), OzonAction, UN Environment, Asia and the Pacific

LATIN AMERICA AND CARIBBEAN

9. México cumple con el manejo y destrucción de sustancias que dañan la capa de ozono

El proyecto consistió en la eliminación de 113 toneladas de estas sustancias. Equivale a dejar de emitir 740 mil toneladas de CO_2 a la atmósfera.

En el marco del 30 aniversario del Protocolo de Montreal, la SEMARNAT informa que finalizó el proyecto de manejo y destrucción de sustancias agotadoras de la capa de ozono (SAO), la cual consistió en la eliminación de 113 toneladas de estas sustancias que fueron recuperadas de equipos de refrigeración y aire acondicionado, así como de diversos procesos industriales y de la prevención del tráfico ilícito ejecutado de manera efectiva por las aduanas mexicanas.

En el combate al cambio climático, esta eliminación de gases significa la reducción de 740 mil toneladas de bióxido de carbono equivalente, lo que contribuye al cumplimiento de las metas comprometidas por México en el Acuerdo de París.

Alcanzar este resultado implicó, entre otras acciones, la capacitación a técnicos en refrigeración, a través de la cual se logró incrementar la capacidad de recuperación de gases refrigerantes y, en lugar de emitirlos a la atmósfera, gestar un nicho económico para promover el acopio y manejo de estos residuos e impulsar tecnologías más eficientes.

El proyecto contó con el apoyo del Fondo Multilateral del Protocolo de Montreal, así como de la aportación bilateral del gobierno francés, cuyos fondos provienen de la Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI).

El tratamiento de las SAO, a cargo de las empresas Quimobásicos y Holcim México, se llevó a cabo con tecnología de última generación a través de un sistema de arco de plasma de argón y coprocesamiento en horno cementero, con apego al cumplimiento de la normatividad nacional e internacional.

La tecnología de arco de plasma de argón es única en América Latina. En 2015 la empresa Quimobásicos realizó el tratamiento de 74 toneladas de SAO inyectándolas directamente al plasma y sometiéndolas a una temperatura de 10,000ºC, con lo que la emisión a la atmósfera de estos gases fue prácticamente nula.

Por su parte, a inicios de este año la empresa Holcim México finalizó el coprocesamiento de 39 toneladas de SAO: las introdujo en un horno a temperatura aproximada de 1,300ºC a fin de generar una reacción química que separó y capturó sus compuestos en una mezcla de cemento.

La SEMARNAT destacó la coordinación establecida con la Dirección General de Aduanas del Servicio de Administración Tributaria para prevenir el tráfico ilícito de gases refrigerantes. Esto, además de contribuir al cumplimiento del Protocolo de Montreal, permite que los programas de sustitución de refrigerantes tengan un éxito asegurado y principalmente que la industria y los usuarios finales tengan la certeza de que sus equipos funcionarán de manera correcta.

De igual forma, se reconoció la colaboración de los centros de acopio de refrigerantes del Fideicomiso de Ahorro de Energía Eléctrica (FIDE), así como de la industria farmacéutica que ha aportado cantidades significativas de SAO recuperados.

- Para ver el video del proyecto clic aquí
- Secretaría de Medio Ambiente y Recursos Naturales, Comunicado de Prensa Núm. 27/17, 22 marzo 2017

10. Concluye la primera etapa del proceso de revisión y consulta de la Norma Técnica para el Manejo de Refrigerantes a Base de Hidrocarburos (Panamá)

Desde julio 2016, el Comité Intergubernamental de Hidrocarburos, coordinado por la Dirección General de Normas Técnicas y Tecnología Industrial del Ministerio de Comercio e Industrias viene realizando el proceso de revisión y consulta de la Norma Técnica para el Manejo de Refrigerantes a Base de Hidrocarburos.

En el marco de las actividades de apoyo del Programa de Fortalecimiento Institucional de la UNO/MINSA, el Comité Intergubernamental de Hidrocarburos, con el apoyo del... Consultor Ing. Augusto Mendoza, llevó a cabo un taller para culminar la primera etapa de discusiones técnicas a la propuesta.

Al evento que se celebró los días 16 y 17 de marzo de 2017 en el Salón Jade del Hotel El Panamá asistieron 13 participantes de los sectores público, privado y educativo que tiene responsabilidad e incidencia sobre el tema, a saber: la Unidad Nacional de Ozono del Ministerio de Salud (UNO/MINSA), la Secretaría de Energía, el Ministerio de Comercio e Industria, el Ministerio de Ambiente (MiAmbiente), la Junta Técnica de Ingenieros y Arquitectos (JTIA), la Asociación Panameña de Técnicos de Aire Acondicionado y Refrigeración (APAYRE), el Instituto Nacional de Formación Profesional y Capacitación para el Desarrollo Humano (INADEH), la Universidad Tecnológica de Panamá (UTP), entre otros.

Como paso subsiguiente, la coordinación del Comité circulará de manera oficial el texto del documento entre todas las instituciones involucradas para revisión y comentarios finales por escrito. Finalmente, se organizará la presentación a los sectores de la industria y el comercio, así como al área de los servicios de refrigeración y aire acondicionado para lograr la aprobación y consenso de la norma.

- Unidad Nacional De Ozono Panamá, 17 Marzo 2017

NORTH AMERICA

11. International Institute of Ammonia Refrigeration's Resources for Using NH_3 and CO_2

Date: Tuesday, 2 May 2017 | Time: 2:00 pm to 3:00pm (*Eastern time*)

Description: Eric Smith and Dave Sainato from the International Institute of Ammonia Refrigeration (IIAR) will discuss the IIAR's scope and mission. This will include the development of guidelines and standards, research projects, and other efforts that should benefit the application of small charge ammonia systems and CO_2 systems. They will discuss the perceived benefits and detractions of using ammonia as a primary refrigerant as well as IIAR's efforts in code development, education and international outreach.

To join the webinar: 1. Go to http://epawebconferencing.acms.com/nh3co2refrigerants/ 2. Select "Enter as a Guest". *It is important that you select the option to enter as a guest*. 3. Enter your name. 4. Click "Enter Room". 5. Click "OK".

For audio: 1. Call the toll free call-in number: 1-866-299-3188 (706-758-1822 from outside the U.S.) 2. Use Conference Code: 202 343 9185#

- US EPA GreenChill, March 2017

12. Supermarkets Gear Up for New Regulations on Common Refrigerants

Supermarket owners and operators across Europe are getting to grips with the implications of new EU Regulations on so-called F-Gases (No. 517/2014), which include common refrigerants used in store refrigeration and air conditioning systems. We offer an overview of the regulations and what supermarkets should be doing to safeguard their businesses, provided by leading compressor manufacturer Bitzer.

There has been concern for some time over the global warming potential of certain common refrigerants, used extensively in food refrigeration systems and air conditioning.

One family of gases in particular has come under the spotlight, HFCs, due to their long atmospheric lifetime and potential impact on global warming.

HFC refrigerants are commonly used in retail chillers and freezers, and in store air conditioning systems. Ironically, HFCs were introduced as more environmentally friendly alternatives to replace ozone-damaging CFC and HCFC-based refrigerants, which were banned a number of years ago.

While the new generation of HFCs do not harm the ozone layer, their high global warming potential (GWP) has emerged as a serious Achilles heel.

This has in fact proved to be a fatal flaw, and, in response, the EU recently adopted tough new regulations designed to reduce the use of the most intensely global warming HFC refrigerants in the medium term, and eliminate them in the long-term.

For businesses which depend on these refrigerants, such as supermarkets and food and drink manufacturers, it is important to be aware of the new responsibilities placed on those who own and operate equipment that uses HFCs.

In addition, given the significant capital cost of replacing refrigeration and air conditioning equipment, it is important to be aware of the implications of the new regulatory framework around F-Gases, in particular the reduction in availability of high GWP HFC refrigerants over time, and the business implications of refrigerant choice, both now and in the future.

Complying with the regulations involves a number of mandatory responsibilities. These are summarised below:

Complying with the revised EU F-Gas Regulation

Purchase of new equipment

- Comply with various bans on the use of HFCs in new commercial equipment (new requirement);

- Take account of service ban when selecting refrigerants (new requirement)

- Take account of HFC phase-down when selecting refrigerants (new requirement)

Operation of existing equipment

- Mandatory leak checks and repairs

- Use new CO_2 equivalent (CO_2e) size thresholds for mandatory leak checks;

- Use new CO_2e size thresholds for automatic leak detection (new requirement);

- Keep records about all refrigeration equipment using HFC refrigerants;

- Service ban, affecting maintenance of existing high GWP systems − g. HFC R404A (new requirement);

- Use certified technicians for leak checking and refrigerant handling operations;

- End-of-life requirements;

- Mandatory recovery of refrigerant by certified technicians.

The regulations governing the purchase of new equipment depend on the type and size of refrigeration plant involved. Most importantly for supermarkets, the use of very high GWP refrigerants will be banned in commercial applications from 2020.

This will mainly affect R404A and R507A, commonly used refrigerants with a very high global warming potential. However, due to the phase-down requirements and the related refrigerant quota system, a severe shortage of these refrigerants can already be expected in 2018. In consequence R404A and R507A should not be used any more in new equipment.

In addition, use of relatively modest GWP refrigerants (less than 1500) will be banned for hermetically sealed commercial refrigerators and freezers from 2022. This will mainly affect the use of R134a, a very common refrigerant in near universal use. There are further bans in relation to central refrigeration plant with capacities above a certain size. There are also service bans on the use of certain high GWP refrigerants in the future, which could restrict the longevity and operational working life of plant.

These looming restrictions are driving the present search for safe and efficient alternatives, with carbon dioxide, HFO refrigerants and, to a lesser extent, hydrocarbons, leading the way as the most viable current alternatives for future-proof cooling.

In addition to the bans on refrigerant usage, another factor to take into account in relation to purchasing decisions is the impact of the above mentioned HFC phase-down on refrigerant supply levels and costs. Under the regulation, the quantity of HFCs that can be offered for sale in the EU must be reduced by 79per cent by 2030.

This sounds a long way off, but means that equipment purchased now or in the near future will still be operational when supplies of relevant refrigerant are dwindling dramatically, with costs escalating many times the current price. For this reason, it makes sense for end users to ensure equipment purchased from now on operates on refrigerant with the lowest possible GWP rating.

In addition to the implications for purchase of new plant, the F-Gas Regulation includes a number of requirements that impact the use and maintenance of existing refrigeration plant containing HFC refrigerants.

The precise requirements depend on the type and capacity of equipment involved, but broadly relate to leak prevention, record keeping, service ban, and use of trained technicians.

On leakage, it is illegal to intentionally release F-Gases into the atmosphere, and owners of plant must take all practicable measures to minimise leakage. If a leak occurs, steps must be taken immediately to remedy the problem.

Those operating HFC-containing equipment must carry out mandatory leak tests on equipment above a certain size and global warming potency. This means that, in a change from previous requirements, even relatively small systems must now be leak-tested regularly if they contain high GWP refrigerants. For example, the charge size threshold for R404A is just 1.3kg.

For larger systems, automated leak detection must be installed. In the case of R404A refrigeration systems, the new threshold for automatic leak detection is reduced to 127 kg, a significant reduction from the previous threshold. To ensure they are working properly, automatic leak detection systems must be tested at least once every 12 months.

It is also a mandatory requirement that end users keep detailed records on every item of equipment subject to a mandatory leak check, and that records are available for inspection at all times.

As can be seen, the revised F-Gas Regulation represents a significant tightening of control on the previous requirements, and places substantial additional responsibilities on owners of F-Gas containing equipment. Supermarkets and the food and drink supply sector are in many ways at the forefront of this.

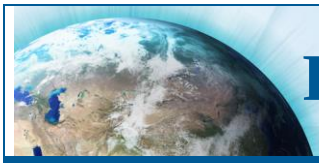
The best approach is to future-proof your business from legislative change, by investing in equipment which runs on refrigerant with the lowest possible GWP, subject of course to it being safe and efficient. There is currently a lot of conflicting advice in the market, as proponents of the various alternatives seek to promote their own preferred solution.

Reputable suppliers, such as leading compressor manufacturer BITZER, can provide independent advice on refrigerant choice, based on objective assessments and field trials, and highlight the trade-offs that might be involved. (See Further Information box with links below).

This is important to take into account, as energy penalties with less efficient refrigerants and/or system solutions may negate their otherwise excellent environmental benefits, with additional but hidden costs to the planet and the end user's bottom line.

In this connection it is worth mentioning the Ecodesign Regulations (already in place for some product categories and on the way for others), which define legally binding minimum energy performance standards. For further details, follow the links in the panel below.

- International Supermarket News, 27 March 2017



FEATURED

OZONE SECRETARIAT

- - Twenty-Eighth Meeting of the Parties.
- - Resumed 38th meeting of the Open-ended Working Group.
- - 57th meeting of the Implementation Committee.

Final text of the Kigali Amendment to the Montreal Protocol available in all the six official UN languages (A C E F R S)

Click here to access MOP 28 documents, General information …etc.

- Browse through the Ozone Secretariat "In Focus" to learn about latest updates.
- Click here for Montreal Protocol Meetings Dates and Venues
- Methyl Bromide Technical Options Committee 2014 Assessment Report
- Medical Technical Options Committee 2014 Assessment Report

Progress & Quadrennial Assessment Reports:

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

Halon Technical Options Committee Reports:

- Halons Technical Options Committee 2014 Assessment Report (Volume 1)
- Halons Technical Options Committee 2014 Supplementary Report #1 - Civil Aviation (Volume 2)
- Halons Technical Options Committee 2014 Supplementary Report #2 - Global Halon 1211, 1301, and 2402 Banking (Volume 3)
- Technical Note #1- Revision 4 - Fire Protection Alternatives to Halon - 2014
- Technical Note #2 - Revision 2 - Halon Emission Reduction Strategies - 2014
- Technical Note #3 - Revision 2 - Explosion Protection - Halon Use and Alternatives - 2014
- Technical Note #4 - Recommend Practices for Recycling Halon and Halocarbon Alternatives - 2014
- Technical Note #5 - Halon Destruction - 2014

THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

Agenda of the 78th Meeting of the Executive Committee (April 2017) and information note for participants

Report of the 77th Meeting of the Executive Committee, 28 November - 2 December 2016, Montreal, Canada

See also: Adjusted business plan of the Multilateral Fund for 2017-2019 after the 77th meeting of the Executive Committee

Learn more

OZONACTION

UN Environment, OzonAction highlights

OzonAction Factsheets:

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

OzonAction Factsheet: Refrigerant Blends: Calculating Global Warming Potentials (post-Kigali update)

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

OzonAction Factsheet: Tools Commonly used by Refrigeration and Air-Conditioning Technicians

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

Please share with your RAC associations, technicians and other interested stakeholders…

Now available in the Android Play Store and Apple Store/iTunes.

Available on the App Store ANDROID APP ON Google play

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

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

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

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

Regional News Drops

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

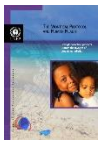
The NOUs were asked about their success stories, alternative refrigerants selected and their personal messages for national ozone celebrations…

Click here to access the News Drops

OzonAction Recent Publications:

Lower-GWP Alternatives in Commercial and Transport Refrigeration: An expanded compilation of propane, CO_2, ammonia and HFO case studies - This booklet presents an expanded compilation of case studies on lower-GWP alternatives in commercial and transport refrigeration and provides an update to the first set of case studies which was published in 2014 by UNEP DTIE OzonAction/CCAC (Low GWP Alternatives in Commercial Refrigeration: Propane, CO_2 and HFO Case Studies.

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



THE MONTREAL PROTOCOL AND HUMAN HEALTH - This booklet summarizes how the successful implementation of the Montreal Protocol has protected human health. It describes how ozone depletion would have led to increases in UV radiation and, based on current understanding of the mechanisms by which UV affects biological processes, how that would have led to a dramatic increase in skin cancers, cataracts and affected human health in other ways. It also covers recent progress in understanding the 'World Avoided' – that is the world we would have lived in without a successful Montreal Protocol. Read/Download

FINANCING THE CLIMATE CO-BENEFITS OF THE HCFC PHASE-OUT - A guide for Low Volume Consuming Countries - Hydrochlorofluorocarbons (HCFCs) are being phased out worldwide under the Montreal Protocol on Substances that Deplete the Ozone Layer. The Parties to this treaty encouraged countries to promote the selection of alternatives to HCFCs that minimise environmental impacts, in particular impacts on climate. The Protocol's Multilateral Fund encourages developing countries to explore potential financial incentives and opportunities for additional resources to maximise the environmental benefits from HCFC Phase out Management Plans (HPMPs). This booklet explains how Ozone Officers in low volume consuming countries can explore such opportunities for climate co-benefits. Read/Download in English | French | Spanish

SAFE USE OF HCFC ALTERNATIVES IN REFRIGERATION AND AIR CONDITIONING - An Overview for Developing Countries - Many of the alternative refrigerants to

hydrochlorofluorocarbons (HCFCs) have particular characteristics in terms of toxicity, flammability and high pressure which are different from those used previously. It is therefore important that the refrigeration and air-conditioning industry adapts to both the technical and safety issues concerning these refrigerants. This publication provides an overview of the alternatives, their general characteristics and their application in the context of the safety issues. It provides guidance for National Ozone Units (NOUs) and other interested parties in developing countries on how they can advise and assist their national stakeholders in the selection and implementation of alternative refrigerants. Read/Download

PHASING-OUT HCFCS IN SMALL AND MEDIUM-SIZED ENTERPRISES - This booklet aims to assist foam enterprises, especially SMEs, to better understand policies on HCFC phase-out, access to assistance from the Multilateral Fund for the Implementation of the Montreal Protocol and access alternative technologies in different foam applications taking into account challenges in converting to alternative technology. It also discusses some tips on how to identify enterprises that may use HCFCs and verify the HCFCs consumption of enterprises. Read/Download

INTERNATIONAL STANDARDS IN REFRIGERATION AND AIR-CONDITIONING - This guide provides an introduction and simple overview of the issues related to international standards in the refrigeration and air-conditioning sector and how they can be useful in the context of the phase-out of hydrochlorofluorocarbons (HCFCs) in developing countries as required by the Montreal Protocol on Substances that Deplete the Ozone Layer. Read/Download in English | French | Spanish

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

Phasing out HCFCs in Small and Medium-sized Foam Enterprises

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

Low-GWP Alternative for Small Rigid PU Foam Enterprises

Learn more about OzonAction publications

EVENTS

2017

Refrigeration Standards Update, Safety and Environmental Requirements, AIRAH and Standards Australia are pleased to present a seminar series on the recently adopted and published refrigeration safety and environmental standards; AS/NZS/ISO 817:2016 Refrigerants – Designation and safety classification which replaces AS/NZS 1677.1:1998 and AS/NZS 5149 Refrigerating systems and heat pumps – Safety and environmental requirements: Parts 1 to 4, which replaces AS/NZS 1677.2:1998. Each of these new adoptions have had major modifications and revisions over the previous AS/NZS1677 series and are critical as we move to low global warming potential refrigerants. AIRAH will be holding the update seminars throughout Australia in February and March 2017 to provide an introduction and overview to the main changes that will affect the HVAC&R industry.

Sustainable Management of Refrigeration Technologies in Mobile Marine and Fisheries Sectors, co-organized by UNEP, ASHRAE, IIR and UNIDO with the kind support of the Government of the Kingdom of Thailand and the Department of Industrial Works, 6-8 April 2017, Bangkok, Thailand

5th IIR International Conference on Thermophysical Properties and Transfer Processes of

Refrigerant, 23-26 April 2017, Seoul, South Korea

7th Conference on Ammonia and CO_2 Refrigeration Technologies, 11-13 May 2017, Ohrid, Macedonia

12th Heat Pump Conference, 15-18 May 2017, Rotterdam, the Netherlands

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

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

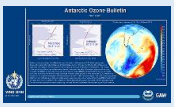
9th International Conference on Compressors and Coolants, 6-8 September 2017, Bratislava, Slovakia

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

READING

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

UNEP and USEPA: Promoting ozone and climate-friendly technologies in public procurement - a scoping study of Asia Pacific



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

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

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

AREA Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants - AREA has updated its Guidance on minimum requirements for contractors' training & certification on low GWP Refrigerants.

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

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

[Primer on Hydrofluorocarbons](#), Fast action under the Montreal Protocol can limit growth of HFCs, prevent up to 100 billion tonnes of CO_2-eq emissions by 2050, and avoid up to 0.5°C of warming by 2100. IGSD, January 2014, Lead authors: Durwood Zaelke, Nathan Borgford-Parnell, and Danielle Fest Grabiel. Contributing authors: Stephen O. Andersen, Xiaopu Sun, Dennis Clare, Yuzhe Peng Ling, and Alex Milgroom.

[Flammable Refrigerants Safety Guide](#), AIRAH - Many of the refrigerants traditionally used in refrigeration and air conditioning systems in Australia have been non-flammable, non-toxic, synthetic greenhouse gases (SGGs) that have a high global warming potential (GWP). These were typically synthetic refrigerants including CFCs, HCFCs and HFCs. Due to the growing national and international concern regarding the resulting atmospheric effects of SGGs, the use of alternative low GWP refrigerants is increasing. …

[Recent Trends in Global Emissions of Hydrochlorofluorocarbons and Hydrofluorocarbons: Reflecting on the 2007 Adjustments to the Montreal Protocol](#). S. A. Montzka *†, M. McFarland ‡, S. O. Andersen §, B. R. Miller †‖, D. W. Fahey †, B. D. Hall †, L. Hu †‖, C. Siso †‖, and J. W. Elkins †† Earth System Research Laboratory, National Oceanic and Atmospheric Administration, Boulder, Colorado 80305, United States ‡ DuPont Chemicals & Fluoroproducts, Wilmington, Delaware 19805, United States § Institute for Governance & Sustainable Development, Washington, D.C. 20007, United States‖ Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80309, United States

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

A first edition, the IIR guide "[CO_2 as a Refrigerant](#)" highlights the application of carbon dioxide in supermarkets, industrial freezers, refrigerated transport, and cold stores as well as ice rinks, chillers, air conditioning systems, data centers and heat pumps. This guide is for design and development engineers needing instruction and inspiration as well as non-technical experts seeking background information on a specific topic. Publication, IIR Technical Guide, 2014.

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

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

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

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

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

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

[Global Market for Natural Refrigerants to Reach 1,408.20 Million by 2020], [Growing at CAGR of 11.0% by 2020]

MOPIA New [2016 Regulatory Compliance Guide] summarizes regulatory controls (*Manitoba and Canada*) and provides some other useful links and references...

[The Importance of Ambition in the 2016 HFC Phase-Down Agreement]. Download the full report [here]

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

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

January Edition of [Accelerate America!] By shecco

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

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

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

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

MISCELLANEOUS

OzonAction News Drops

In field largely dominated by men, Madelyn Stolz, from Fiji, is not afraid to break barriers as one of the few Female RAC technicians. The Refrigeration Servicing Sector (RSS), especially small and medium-sized segments of this sector, is one of the most affected sectors by technological changes in the refrigeration and air-conditioning (RAC) industry. The recent developments within the industry requires different approaches that need to go beyond the typical good practices training. All future refrigerants are coming with safety considerations, and this involves a change in the mindset of operators and technicians when installing, operating and servicing RAC applications.

Watch Madelyn's interview as she tells us about her experiences so far.

Watch other OzonAction News Drops

CLIMATEACTION UNEP

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

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

- Immediate and permanent access to the latest research and to IJR archive
- Access the latest articles as soon as they become available online.
- Browse, search and read each one of the nearly 4,500 papers since Volume 1, Issue 1.
- Unlimited access to seminal contributions to the field of refrigeration dating back to 1978.
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- Consult the research highlights overview of articles in volumes from 2012 onwards.

To access this new service, click "activate my e-IJR subscription now" and follow the instructions.

International Observers - New AREA membership category - Due to the significant worldwide interest in European legislative developments and the increase in competence of personnel who handle new refrigerants, AREA is pleased to introduce its brand new "International Observer" membership category. This provides a fantastic opportunity for non-European RACHP installer bodies the world, to benefit from the expertise and discussions within Europe through access to AREA. Contact: info@area-eur.be

TRAINING AVAILABILITY - The UEE32211 Certificate III in Air-conditioning and Refrigeration is conducted at the APTC Suva Campus in Fiji.

COURSE DURATION - Course duration is 22 weeks full time including a 1 week mid semester break. Students will attend classes for a minimum of 5 days per week. Training will be delivered face to face. Training will be delivered in English incorporating language, literacy and numeracy (LLN) support and a work skills facilitation program. Additional out-of-hours study time will be required.

ENTRY REQUIREMENTS - Applicants must be a citizen of a Pacific Island Forum country. Individuals are required to have a minimum equivalent of one year full time recent industry experience and hold a relevant local qualification. Applicants will be asked to complete the Literacy and Numeracy Assessment and Vocational Knowledge Assessment. Applicants may apply for recognition of prior learning. For further information visit:

http://www.aptc.edu.au/index.php/recognition of-prior-learning.

COURSE FEE - The course fee is FJD 3,500. The fee includes personal protective equipment, stationery and uniform. The Australian Government subsidises the cost of the course including materials and consumables. Course fees are subject to change without prior notification.

For current fees visit: http://www.aptc.edu.au/index.php/course-fees

**Courses offered, course dates and fees may vary depending upon student and industry demand*.

NASA has launched an ozone sensor to help monitor long-term change in the ozone layer. This sensor, called SAGE III, will be installed on the International Space Station in 2017.

Watch the ScienceCast Video

UL is running a series of 4 webinars on flammable refrigerants in spring. **The webinars are:**

- Session 1: An Introduction of the 2017 updates to the White Paper: Revisiting Flammable Refrigerants, Wednesday, February 22, 2017 at 2:00 p.m. EST
- Session 2: An Overview of Codes and Standards Activities, Wednesday, March 29th at 2:00 p.m. EDT
- Session 3: An Overview of the Science of Flammable Refrigerants, Wednesday, April 26th at 2:00 p.m. EDT
- Session 4: Panel Discussion – Uncertainty, Gaps, and What's Needed to Continue the Implementation, Wednesday, May 17th at 2:00 p.m. EDT

Session 1: **An Introduction of the 2017 updates to the White Paper: Revisiting Flammable Refrigerants**
For your convenience, you can view the recorded version online. Link to the recorded webinar

More information available here

The Montreal Protocol Who's who
See the latest nominations /

Nominate Ozone Layer Protection Champion

From Your Country /Region >>

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

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constitute endorsement of those items by UNEP.

If you have questions or comments regarding any news item, please contact directly the source indicated at the bottom of each article.

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