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Global

1. Statements by Mr Emmanuel Macron, President of the Republic, at his joint press conference with Mr Xi Jinping, President of China, Mrs Angela Merkel, Chancellor of Germany, and Mr Jean-Claude Juncker, President of the European Commission (excerpts)



[At the invitation of Mr. Emmanuel Macron, President of the French Republic, Mr. Xi Jinping, President of the People's Republic of China, made a state visit to France from 24 to 26 March 2019. Both parties reviewed the international situation and the global and regional issues of major importance. The following is an excerpt from the statement.]

EU/China

First of all, on behalf of us all, I want to thank President Xi Jinping for agreeing to take part in this discussion during a bilateral visit.

Indeed, dialogue between China and Europe has become crucial in order to determine the global power balance and protect multilateralism, especially in the context we're familiar with and an unprecedented crisis in our recent history.

For the past hour and a bit, the four of us have just had a very fruitful and very free discussion about these issues, touching not only on the bilateral relationship between China and the European Union but also on our views about multilateralism, and from our very constructive discussions four basic points of agreement stand out for me.

[...] Climate

The second point of agreement is about building this strong multilateralism on the climate issue. Indeed, we have to address this emergency. The United Nations Secretary-General has written a few words to us to emphasize this climate agenda, which he's made central to the ambitions of this September's summit in particular. Together we very clearly have the means to take action. We were able to provide the G20 with impetus to adopt the Paris Agreement's implementation rules. We must now move up a gear, and the agreement signed bilaterally between China and France, made public this morning, is an extremely strong step forward on the issue. I really want to thank President Xi Jinping for the clear indications he's giving on China's ambitions in terms of reducing greenhouse gas emissions, and in terms of the desire to take very practical action on issues such as development finance and implementing the Kigali Amendment on HFCs, which is a point and an essential battle we want to fight together, precisely so as to abide by our international climate commitments. The European Union will also be active in ensuring this very leadership, but for me this climate agenda, together with the issues of security and peace, is an extremely crucial factor in this strong multilateralism which we very much believe in and which we've just talked about. [...]

For its part, the European Union, which is the world's largest provider of development assistance, must also play its full role on the international stage, and I think that by coordinating these initiatives we can build something extremely innovative and formative. Indeed, we must succeed in identifying – and I believe in this possibility – a common agenda precisely of connectivity, where we can build infrastructure and facilities, honour our climate commitments and do so very scrupulously, have extremely strong education and health policies, and have a financial sustainability agenda for all the third countries that are partners in these initiatives.

Ultimately, if we respect this joint framework we talked about a great deal this morning, I believe we can not only take many countries and peoples out of poverty and help them but also do so extremely inclusively and sustainably. (...)

We respect China and we're determined to engage in dialogue and cooperation, and we obviously expect our major partners, too, to respect both the European Union's unity and the values it upholds for itself and in the world. [...]

Read full statement [French](#)

[Palais de l'Élysée, 26 mars 2019](#)

See also >>> [China, EU Agree to Strengthen Cooperation, Strategic Partnership for Sustainable Development](#). IISD reporting services

2. Weighing consumer safety versus climate action

The transition to new air conditioning refrigerants will involve difficult tradeoffs. Air conditioning (AC) has transformed life in hot and humid countries including the US, Japan and Korea. Over 85 to 90% of homes have air conditioners in these countries. The developing world is rapidly following suit. AC sales are skyrocketing in India, China, Southeast Asia and elsewhere. Sales aren't just gradually climbing as average incomes increase. Instead, AC sales are taking off very quickly as households move into the middle class [...]

Access to air conditioning has produced enormous benefits to human health, happiness and productivity. Over the next decades, hundreds of millions more people, if not billions, will enjoy the benefits of air conditioning.

That's the good news. Unfortunately, the spread of air conditioning is also harming the environment.

These harms come in two forms. First and foremost are the greenhouse gases and health-harming pollutants produced by the fossil fuelled power plants that make electricity for air conditioners. But a close second are harms caused by the refrigerants—the chemicals that enable an air conditioner to absorb heat from an indoor space and then expel it to the outdoors. These chemicals have been escaping into the atmosphere. In the atmosphere they've eaten away at the life-protecting ozone layer and are adding to the climate change challenge. The most common refrigerants have 2000 times the global warming potential of an equal mass of carbon dioxide. One study estimates that refrigerants account for a quarter of the greenhouse gas emissions associated with air conditioning. While there is uncertainty around that estimate, atmospheric measurements remove any doubt that these chemicals are, in fact, entering the atmosphere.

Choosing Safety over the Environment

There's a good reason why the air conditioning industry relies on chemicals that are bad for the environment—they're safe for consumers. The development of a safe refrigerant, Freon, in the 1930s led to the widespread adoption of AC by US households. Before Freon came along, the industry had been experimenting with toxic and flammable options. These higher-risk options were acceptable for industrial refrigeration, but not for household use.

Unfortunately, decades later, Freon, a type of chlorofluorocarbon (CFC), was found to be depleting the ozone layer. Countries came together in the 1980s and developed the Montreal Protocol, a plan to phase out CFCs and replace them with less harmful alternatives. The industry settled on options that maintained safety but didn't harm the ozone layer. These are known as hydrofluorocarbons (HFCs). HFCs solve the ozone layer problem, but are still quite bad for the climate. A kilogram of the most common HFC in air conditioning is 2,000 more potent as a greenhouse gas than a kilogram of carbon dioxide.

To put the climate damage caused by HFCs in dollar terms I did a back-of-the-envelope calculation for two common AC units, assuming a social cost of carbon of \$50 per ton of carbon dioxide-equivalent. I found that if all



Canisters holding five different kinds of refrigerants. SOURCE: Licensed under CC BY-SA 3.0

Environmental Impact of Air Conditioner Refrigerants and Trends

	Ozone Depletion Potential (ODP)	100 Year Global Warming Potential of Different Refrigerants ¹
R12 (CFC)	1.0	10,900
R22 (HCFC)	0.055	1,810
R410A (HFC)	0	2,090
R32 (HFC)	0	675

Comparison of the ozone layer and greenhouse gas potency of refrigerants used for home air conditioning. SOURCE:

the refrigerant leaked out of a mini-split air conditioner that is popular in India, the climate change damage would be about \$120. For a 2-ton, central AC unit, a common size in the US, the damages would be over \$300.

In 2016, countries gathered once again under the auspices of the Montreal Protocol to find a way to phase down HFCs. They developed a new agreement, known as the Kigali Amendments, that would phase down the climate impact of refrigerants over the next 30 years. Sixty-nine countries have ratified the amendments. Notably, today's two largest producers and consumers of HFCs, the US and China, have not signed on. Neither has India, the country likely to lead global air conditioning use in the future given the country's hot, humid climate and large population. India's likely in no rush since they negotiated a phase down that doesn't begin until 2028.

The Kigali Amendments bring back to the forefront the consumer safety versus environment trade-off. Based on current air conditioning technologies, there's a direct trade-off between addressing climate change and refrigerant flammability. Lower global warming potential refrigerants such as R-32 and propane are more flammable. In the near-term, to phase down HFCs, countries will need to squarely confront this trade-off.

Striking the Right Balance

There are several approaches a country could take to balancing consumer safety and the climate in this case.

One option would be to maintain that consumer safety is paramount and no flammability risk is acceptable when it comes to air conditioning. This implicitly says that the perceived cost in terms of safety is too high relative to the climate change benefit. A government holding this position would want to keep all flammable refrigerants off the market. Such a country would be depending on the development of new air conditioning technologies and refrigerants to meet its Kigali phase down goals. Hopefully, countries in this camp would also be committing serious resources to innovation. If new technologies don't appear this view could lead a country to conclude that phasing out HFCs just isn't worth the cost and continue relying on existing non-flammable options. The US is currently in this camp.

Another option is for a country to allow more flammable refrigerants to enter the market, with significant regulatory safeguards. Japan, Europe and Australia are taking this approach. An alternative refrigerant, R-32, which is classified as "mildly flammable", has entered the market and captured a large market share. R-32 has been well known for decades but has been rarely adopted due to its flammability. These governments have, in effect, reconsidered the prudent balance between consumer safety and climate change and concluded a riskier refrigerant is needed given the costs of climate change.

As with many climate policies, this trade-off presents the challenge that the "winners" and "losers" are different. The "winners" are people around the world, now and in the future, who benefit from less climate change. The "losers" are the households who now have a flammable chemical in their home. Another difficulty is that the actual risk posed by flammable refrigerants is hard to quantify in neat, cost-benefit terms and communicate to the public. This is reflected in government and industry websites that explain the rationale of the decision to the public.

From a climate perspective, a transition to R-32 may not be enough. It's only one-third as potent a greenhouse gas as the refrigerant that it replaces, but is still a significant greenhouse gas. It won't be sufficient for countries to meet their longer-term Kigali goals. To go further new refrigerants are needed. Ironically, a fossil fuel, propane, is a leading contender for this role due to its climate-friendliness relative to the alternatives. While propane is already used widely in the developed and developing world for heating and cooking, it's flammability is put forward as a barrier to its use in air conditioning.

As efforts to address climate change progress, difficult trade-offs will likely become more common. It will be more important for policymakers to recognize the trade-offs and carefully balance them. Maybe in some cases new technologies will save the day and make the transitions easy. This was the story with the elimination of ozone depleting refrigerants. A near-equivalent alternative was found that didn't harm the ozone layer. In other cases, these trade-offs will remain and society will need to work through them. This is where the HFC phase-down sits today.

The Energy Institute at Haas, 22 April 2019, By: Andrew Campbell

3. ASHRAE/UNEP Lower-GWP Refrigeration and Air Conditioning Innovation Award

What Is Lower-GWP Refrigeration and Air-Conditioning Innovation Award?

The award promotes innovative design, research and practice by recognizing people who have developed or implemented innovative technological concepts applied in developing countries to minimize global warming potential (GWP) through refrigeration and air-conditioning management.

Who Are the Awarding Organizations?

Award recipients will be recognized by ASHRAE and UN Environment.

How Often Is the Award Issued/Awarded?

Annually

What Are the Award Categories?

First Place and Honorable Citation awards are made in two categories:

- Residential Applications
- Commercial/Industrial Facilities

What Are the Entry Criteria?

The award promotes innovative design, research and practice by recognizing people who have developed or implemented innovative technological concepts applied in developing countries to minimize global warming potential (GWP) Refrigerants.



How Do I Enter for the Award **ENTER FOR THE AWARD**

The submission form requires descriptive responses to each of the following:

- Description of innovation in field of lower-GWP refrigerants
- Project/Applicant details (description must include confirmation project has been implemented and date of implementation)
- Extent of need.
- Description and goal of the research, design, practice or project
- Naming of low GWP refrigerants used and description of associated refrigerant management practices associated with the lower GWP refrigerants
- Environmental impact achieved including specific reference to the GWP chemicals' contribution
- Further application of project
- Financial feasibility in developing countries and economic impact of the research, design or practice
- Photographs illustrating the project and tables, figures or charts that present statistical data demonstrating the project's successful performance or experimental findings are encouraged to be provided with the application.

When Does the Entry Period Begin and End?

Submission of entries for 2019 awards will be accepted between January 2019 and May 15, 2019.

How are the Winners Selected?

The winners in each category will be selected based on innovative solutions for designs, practice or research using lower-GWP technologies. The selection will take into account the following criteria:

- Extent of need (25%);
- Innovative aspects in transforming conventional practices (25%);
- Technical replicability to developing countries (25%); and
- Economy feasibility to developing countries (25%).

What Happens to the Winning Projects

Winning projects will be publicized by both organizations, and the First Place recipients will receive a stipend to receive their award at a UN Environment event. UN Environment, represented by the Law Division (OzonAction), and ASHRAE have a Memorandum of Understanding to establish technical cooperation and mutual coordination toward providing professional technical services to the refrigeration and air-conditioning stakeholders (governmental, private, and public). The organizations work to ensure that up-to-date related technical information and standards are properly introduced and promoted. ASHRAE is a worldwide technical society of more than 57,000 individual members.

Lower-GWP Refrigeration and Air-Conditioning Innovation Award flyer

Contact:

[Ayman Eltalouny](#), International Partnerships Coordinator OzonAction-UNEP
[W. Stephen Comstock](#), Manager of Business Development EMEA, ASHRAE

4. The IIR launches a Call to Action for World Refrigeration Day



In coordination with the many supporting associations and companies worldwide, the International Institute of Refrigeration (IIR) is launching a Call to Action for World Refrigeration Day.

In support of the world's first refrigeration day, which will take place on June 26, 2019, and with the aim of raising awareness and boosting accessibility of the refrigeration sector from the grassroots up on an international level, the IIR is calling to all stakeholders to actively help bring the HVACR sector to the public eye by organising initiatives in their national markets.

Such initiatives could include, for example, holding open days at refrigeration training centres, organising a poem or a photo competition in coordination with national engineering schools, proposing initiation to refrigeration webinars in sign language or visiting local schools to give the younger generation an opportunity to discover the field.

As the only independent, intergovernmental organisation in the field of refrigeration, the IIR will create and promote a directory of all the different activities that will be organised worldwide in support of this day.

Send your proposals to the IIR, preferably by May 20, at iif-iir@iifiir.org with the subject "Call to Action: World Refrigeration Day".

Proposals should include a brief description of the activity, location, time of the event and contact information.

World Refrigeration Day, held every June 26, will not only be an ideal way to recognise the many historical achievements of the industry, but will also be the hallmark to say "Everyone's included!"

The International Institute of Refrigeration (IIR) is an independent intergovernmental science and technology based organisation promoting refrigeration knowledge and associated technologies that improve quality of life in a cost-effective and environmentally sustainable manner including:

- Food quality and safety from farm to consumer
- Comfort in homes and commercial buildings
- Health products and services
- Low temperature technology and liquefied gas technology
- Energy efficiency
- Use of non-ozone depleting and low global warming refrigerants in a safe manner.

Contact: [Deonie Lambert](#), Communications and Development Manager

International Institute of Refrigeration, 1 April 2019

5. ASHRAE and IIR establish new definitions of five refrigeration keywords



ATLANTA – ASHRAE and the International Institute of Refrigeration (IIR) announced the establishment of new definitions for five refrigeration keywords. The keywords are cooling, refrigeration, chilling, freezing and cold chain.

The definitions are the result of more than a year of discussions and were established to clarify the meaning of basic terminology used in the HVAC&R industry.

“The new definitions will help those within our industry, as well as the general public, gain a clearer understanding of important refrigeration keywords that are often misused or too broadly defined,” said 2018-2019 ASHRAE President Sheila J. Hayter, P.E. “We appreciate the contributions of IIR and anticipate that the adoption of these definitions will be positive.”

To avoid confusion, the official definitions are:

Cooling

- (1) Removal of heat, usually resulting in a lower temperature and/or phase change
- (2) Lowering temperature

Refrigeration

- (1) Cooling of a space, substance or system to lower and/or maintain its temperature below the ambient one (removed heat is rejected at a higher temperature)
- (2) Artificial cooling

Chilling

Cooling of a substance without freezing it

Freezing

Solidification phase change of a liquid or the liquid content of a substance, usually due to cooling

Cold Chain

Series of actions and equipment applied to maintain a product within a specified low-temperature range from harvest/production to consumption

“It was important that the differences that might exist in these definitions between the IIR and ASHRAE be erased for more consistency. It now seems important for us to reach even greater harmonization on an international level to establish universal definitions,” said Jean-Luc Dupont, head of the Department of Scientific and Technical Information of the IIR.

IIR has called on all national and regional organizations and associations to adopt and disseminate the new definitions. The definitions will be included in ASHRAE Terminology, its free comprehensive online glossary of more than 3,700 terms and definitions related to the built environment, with a focus on heating, ventilating, air conditioning, and refrigeration (HVAC&R), as well as building envelope, electrical, lighting, water and energy use, and measurement terms.

ASHRAE, 11 April 2019

Africa

6. Countries in Africa and Asia strengthen local cooperation to prevent illegal trade of ozone depleting substances

There is growing evidence of an increasing illegal trade in ozone depleting substances such as hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) in the European Union. Seizures of hydrochlorofluorocarbons continue to be made elsewhere.

Ozone depleting substances are controlled under the Montreal Protocol on substances that Deplete the Ozone Layer. Under Article 4B of the Montreal Protocol, Parties must establish an enforceable national licensing system to control the import and export of ozone depleting substances. As part of the mandate of the Compliance Assistance Programme, the enforcement and strengthening of licensing systems has been included in the Programme's annual workplan to assist in preventing the illegal trade of ozone depleting substances.

At recent meetings held in Benin and Thailand in October 2018, countries in the Francophone African Network, South Asia and Southeast Asia, recommitted to strengthening cooperation at national level between UN Environment's National Ozone Office and customs and enforcement agencies, for robust implementation and enforcement of the national license and quota systems for ozone depleting substances and hydrofluorocarbons; and to strengthen the cooperation between countries at the regional level to prevent illegal trade of ozone depleting substances.

Although informal communications that establish the veracity of shipments between trading partners is being promoted through informal Prior Informed Consent, a number of countries have been experiencing misdeclaration or mislabeled refrigerants, posing a risk for countries of being unable to meet their obligations under the Montreal protocol and creating difficulties to manage confiscated refrigerants. There are two main aspects that need to be considered in relation to the illegal trade in ozone depleting substances. These are: monitoring of the trade in ozone depleting substances in the domestic market, and between countries.

United Nations Environment Programme, 9 April 2019



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For more information, please contact Arnold.Krihalhuber@un.org | Vanessa.Delval@un.org

Topic

Environmental rights and governance

Institutional strengthening / Institutions / Ozone

Latin America and Caribbean

7. Costa Rica: Around 50 participants from 17 countries participated at a RAC technology road show and the regional GCI network meeting of Latin America and the Caribbean



Proklima organized a "Technological Road Show regarding natural refrigerants" and the "Meeting of the Green Cooling Initiative Network" in San José, Costa Rica, from March 25-28, 2019. The event was part of a series of capacity building measures aimed at decision-makers and technicians of the RAC sector from 17 countries in Latin America and the Caribbean.

The objective of the regional study tour was to visit different RAC technology systems that use natural refrigerants, such as R290 AC Chillers, R290 split ACs, R290 and HN3/CO₂ industrial refrigeration systems, CO₂supermarket refrigeration systems, etc.

Furthermore, we officially initiated the Green Cooling Initiative Regional Network for Latin American and the Caribbean. During the network meeting exchange between RAC experts and decision makers on green cooling

technology and policy took place. Moreover, a two-day negotiation course according to the Harvard methodology was offered to representatives of the National Ozone Units.

The events organized by the Directorate of Environmental Quality Management (DIGECA) of the Ministry of Environment and Energy (MINAE) in conjunction with GIZ Proklima. The events were financed within the framework of the Green Cooling Initiative II project (financed by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, BMU), the SPODS project - (co-financed by the European Commission and the German Federal Ministry for Economic Cooperation and Development, BMZ) and the 4E programme (financed by BMZ).

Contact: Sofia Nürnberger, Proklima International

North America

8. Washington state legislature passes HFC-reduction bill

As part of a series of bills addressing climate change, the Washington state legislature on Monday (Earth Day) passed House Bill 1112, which phases out the use of HFCs in various applications and calls for a study of how to increase the use of products that do not contain HFCs.

The bill passed 30-19, with every Democrat supporting it, along with two Republicans. It now goes to Governor Jay Inslee, who supports climate change legislation and is running for the Democratic party nomination for U.S. president on a platform largely focused on addressing climate change.

In a tweet, Inslee thanked the Washington legislature for agreeing to phase down use of “super-polluting hydrofluorocarbons,” in particular citing state representative Joe Fitzgibbon and state senator Reven Carlyle. “This bill had tremendous support from the private sector [and] I look forward to more states taking action on HFCs through [the U.S. Climate Alliance].”

The bill describes HFCs as “air pollutants that pose significant threats to our environment,” adding that “safer alternatives for the most damaging hydrofluorocarbons are readily available and cost-effective.”

Washington is the latest member of the U.S. Climate Alliance, a bipartisan coalition of 22 state governors (and the governor of Puerto Rico) co-founded by Inslee, to commit to phasing down the use of HFCs. The other states are California, New York, Maryland and Connecticut. The alliance formed in response to the decision by the Trump administration to leave the global Paris climate-change accord.

The states addressing HFC reduction are coalescing around efforts spearheaded by California, which last year passed the California Cooling Act. The bill incorporates HFC regulations abandoned by the U.S. EPA and calls for incentives for natural refrigerant equipment. “It falls to the states to provide leadership on addressing hydrofluorocarbons,” said the text of House Bill 1112. “Doing so will not only help the climate, but will help American businesses retail their positions as global leaders in air conditioning and refrigerant technologies.”

Last December, Inslee unveiled a \$273 million climate action plan – including \$959,000 to phase out HFCs – that would reduce greenhouse gases to 25% below 1990 levels by 2035.

House Bill 1112 puts Washington state on a course to phase down HFCs “in a manner similar to the regulations adopted by the [EPA] and that have been subsequently adopted or will be adopted in several other states around the country.” The EPA regulations include SNAP (Significant New Alternatives Policy) Rules 20 and 21, which stipulated the delisting of high-GWP HFCs in a variety of applications. The bill prohibits the sale or lease of equipment using those HFCs.



The bill sets January 1 deadlines for the prohibition of HFCs in specific applications, including 2020 for supermarket systems, 2021 for refrigerated food processing and dispensing equipment, 2022 for residential consumer refrigeration products (other than compact and built-in products), and 2023 for cold storage warehouses.

By December 31, 2019, all manufacturers must notify the Washington Department of Ecology of the status of each product class using restricted HFCs.

The law also calls for the Department of Ecology, in consultation with the Department of Commerce and the Utilities and Transportation Commission, to complete a report by December 1, 2020, that recommends how to “increase the use of refrigerants with a low global warming potential in mobile sources, utility equipment and consumer appliances” and incentivize “the elimination of legacy uses of hydrofluorocarbons.”

hydrocarbons21, 24 April 2019, By: Michael Garry

9. \$2m funding for low-GWP refrigerant research



The Air Conditioning, Heating and Refrigeration Technology Institute (AHRTI), is to receive \$2m from the US Department of Energy to fund research on low GWP refrigerants.

The AHRTI – the research arm of the AHRI – is to develop a low-GWP refrigerant database in collaboration with Oak Ridge National Laboratory (ORNL) and the National Institute of Standards and Technology (NIST). It is intended that it will provide US manufacturers with accurate refrigerant data to design, manufacture, and commercialise efficient and reliable HVACR products using more environmentally-friendly refrigerants.

As part of the programme, ORNL will develop heat transfer and pressure drop correlations for new refrigerants, which will be used to design and optimise heat exchangers. NIST will measure property data of low-GWP refrigerant blends and implement them into the NIST Reference Fluid Thermodynamic and Transport Properties Database (REFPROP).

AHRTI says the more accurate data will improve confidence in the selection and optimisation of blends for particular applications. It will establish a database for the thermal and chemical stability of low-GWP refrigerants, including lubricants and the long-term compatibility with materials commonly used in air-conditioning and refrigeration systems.

CoolingPost, 20 April 2019

10. Ammonia/CO2 Refrigeration Systems - US EPA GreenChill upcoming webinar



Topic: [Real World Applications and Operation of Ammonia/CO₂ Refrigeration Systems in U.S. Grocery Stores](#)

Date: Tuesday, May 21, 2019

Time: 2:00 pm to 3:00pm (*Eastern time*)

Description: Rob Arthur (CTA) will review the installed and designed ammonia/CO₂ refrigeration systems currently being used or planned in grocery stores in the U.S.. The presentation will include reasons for system selection, communicating system safety with local officials, design considerations, installation experience, operation experience, energy use results, and carbon footprint benefits.

To join the webinar:

1. Visit the webinar access page: [Real World Applications and Operation of Ammonia/CO₂ Refrigeration Systems in U.S. Grocery Stores](#)
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#

Asia Pacific

11.Cambodia builds momentum to address HFC phase-down

Phnom Penh, Cambodia, 24 April 2019 — The General Directorate of Environment Protection, Ministry of Environment organized a national stakeholders meeting in Phnom Penh on 24 April 2019 on the implementation of the enabling activities for HFC phase-down. The meeting was supported by UN Environment's OzonAction Compliance Assistance Programme (CAP).

The meeting was attended by 48 participants with a wide array of expertise; each has a crucial role to play in the implementation of the Kigali Amendment. Representatives from the following Cambodian Ministries attended: Commerce; Economy and Finance; Industry and Handicraft; Labor and Vocational Training; Mine and Energy; Justice; Agriculture, Forestry and Fisheries; Tourism; Public Works and Transport; Information; Education; and Youth and Sport.



The meeting reviewed achievements of the implementation of the Montreal Protocol - including policies and programs that the Royal Government of Cambodia has adopted - and identified potential challenges for the next stage of progression of the Protocol, the Kigali Amendment.

The meeting gave participants a chance to review Cambodia's Country Assessment Report, which has been developed through a national survey, consultation and interviews with various national stakeholders. The report gives a comprehensive overview of institutional arrangements, policy/regulation requirements and capacity of various stakeholders allowing them to map-out what potential challenges Cambodia might come across in ensuring they are able to meet the initial obligations under the Kigali Amendment in the next few years.

The Import-Export Inspection and Fraud Repression Directorate-General and representatives of the General Department of Customs and Excise were present, as well as importers of refrigerants and refrigeration and air-conditioning equipment, customs brokers vocational training schools and departments within the Ministry of

Environment such as the Climate Change Department, Hazardous Substance Department. TV media also attended.

In his opening statement, the Director General of the General Directorate of Environment Protection, H.E Mr. Heng Nareth, emphasized that Cambodia is fully committed toward Montreal Protocol implementation, and the country is in the process of ratifying the Kigali Amendment.

The national stakeholders echoed this keenness for Cambodia to ratify the Kigali Amendment, particularly with regard to licensing and quota systems for import/export control of HFCs, and building the capacity of the refrigeration servicing technicians.

Contact: [Hu Shaofeng](#), Montreal Protocol Coordinator for Asia-Pacific, UN Environment, OzonAction, Bangkok, Thailand

[UN Environment, OzonAction, 11 April 2019](#)

12. UN Environment OzonAction organized the 8th China Ozone2Climate Technology Roadshow and Industry Roundtable in Shanghai



Shanghai – UN Environment in partnership with China Refrigeration & Air-Conditioning Association (CRAA), UNDP, and with support from the International Environmental Cooperation Office (IECO) of China organized the 8th China Ozone2Climate (O2C) Technology Roadshow and Industry Roundtable at the 30th CRH Expo 2019 in Shanghai. The CRH Expo is one of the world's largest heating, ventilation, refrigeration and cooling exhibitions and this year it welcomed over 60,000 visitors from more than 100 countries.

Opening of CRH During the grand opening of the Expo, the message of Ms. Joyce Msuya, Acting Executive Director, UN Environment Programme, that urged the global industry “to take decisive action to embrace clean cooling to secure the future of our planet” was communicated to the leading global technology providers and Chinese industry representatives present. Resonating with this message, Mr. Zhang Zhaohui, Secretary General, CRAA, in his opening statement, announced that “Creating clean cooling and heating is our top priority and in line with our future strategy; our industry looks forward to collaborate with UN Environment to leapfrog technologies and contribute to making the Kigali Amendment for HFC phase-down a success.”

The O2C technology roadshow has been organized in China since 2012 to exhibit the latest clean cooling technologies that are energy efficient and use refrigerants that are non-ozone depleting and zero/low global warming. The O2C technology roadshow recognizes only such clean cooling and heating technologies that meet the aforementioned criteria. Out of the total 1175 exhibitors at CRH Expo 2019, the O2C technology roadshow showcased a selected 50 types of air-conditioners, heat-pumps, freezers, cold storages and other cold chain equipment based on ozone and climate friendly refrigerants. The roadshow also showcased the latest tools that enable technicians to undertake good servicing practices and safe handling of such ozone and climate friendly equipment.

The O2C industry roundtable meeting was held on 10 April 2019 and it attracted more than 100 participants, the majority of whom were from the refrigeration and air-conditioning industry. The objective of the roundtable was to provide an interactive forum for the industry, policy makers and research institutes to share the recent policy and technology developments for mainstreaming clean cooling. This year's presentations and discussions at the roundtable focused on the considerations needed in the future for successful implementation of the Kigali Amendment and the latest updates on removal of technological and commercial barriers for faster transition to non-HFC technologies. In addition to the Kigali Amendment, the impact of evolving Energy Efficiency policies was also identified as one of the key drivers for industries to move towards clean cooling. The forum also emphasized the need for integrated policy formulation and coordination to ensure a cohesive interface with a clean cooling transition. For example, the India Cooling Action Plan which envisages to address all initiatives related to cooling sector of India under a single umbrella policy and coordination framework was presented to the audience.

Contact: [Hu Shaofeng](#), Montreal Protocol Coordinator for Asia-Pacific, UN Environment, OzonAction, Bangkok, Thailand

[UN Environment, OzonAction, 11 April 2019](#)

13. Cleaner future: Kigali Amendment a significant opportunity to live up to the promise of a better environment



India was part of a historic global climate deal that was reached in Kigali, Rwanda, at the 28th Meeting of the Parties (MoP28) to the Montreal Protocol, on substances that deplete the ozone layer.

The Kigali Amendment is a significant opportunity for us to live up to the promise of better environment.

With efforts being made globally to preserve ozone layer, the primary question remains unanswered: “How can we succinctly respond to address global warming and its impact on climate change?” A number of factors are causing climate change and the efforts to address them have been manifold. Large-scale use of environmentally damaging refrigerants is one of the key areas identified, with a direct impact on the depletion of the ozone layer and subsequently on global warming.

India was part of a historic global climate deal that was reached in Kigali, Rwanda, at the 28th Meeting of the Parties (MoP28) to the Montreal Protocol, on substances that deplete the ozone layer. The Kigali Amendment, an amendment to the 1987 Montreal Protocol, aims to phase [down] high-global-warming-potential hydrofluorocarbons (HFCs), a family of potent greenhouse gases (GHG), by late 2040s. Under this amendment, 197 countries, including India, agreed to a timeline to reduce the use of HFCs by 80-85% of their baselines over the next several decades.

HFCs have many everyday applications. These include refrigerants to cool cars, appliances and buildings, foam-blowing agents that create cushioning and insulating foam, solvents used in manufacturing to clean and sanitise, and certain specialty propellants used in products like aerosols. When HFCs are released into the atmosphere, they trap GHGs with significant global-warming-potential (GWP) and take years, sometimes decades, to break down in the atmosphere—thus contributing to the overall warming of the planet. HFCs have high a GWP. For example, HFC-134a, the commonly used automobile refrigerant, has a GWP of 1,300, which means its impact on global warming is 1,300 times that of carbon dioxide (CO₂). Replacing high GWP HFCs with low-GWP HFO alternatives could help avoid up to 0.5°C of warming by the end of this century.

This background triggers an opportunity, as well as a set of challenges for the industry at large to develop new technologies and transition to the use of more environmentally preferable alternatives. There has been a continuous effort globally to cut down the use of high-GWP HFCs ever since we decided to shift from chlorofluorocarbons to HFOs. Thus, the journey to explore alternatives continues, to meet the diverse requirements of industry.

Addressing the implications for India

India is the world’s fourth-largest emitter of CO₂. According to a report by the International Energy Agency (IEA), the share of space cooling in peak electricity load is projected to rise sharply in India, from 10% today to 45% in 2050. Given the estimations of India’s rapid economic growth, the government has recognised the importance of lowering the country’s GHG emissions as part of an international effort to limit global warming. Along with the NITI Aayog, the government is working towards an India Cooling Action Plan, meant to meet the country’s growing cooling needs in a climate-friendly manner. One of the key focus areas in the Action Plan is in-room air conditioners (ACs). The Lawrence Berkeley National Laboratory (LBNL) estimates that if by 2030, India’s AC stock improves in average efficiency by 30% from 2015 levels, annual CO₂ emissions will decrease by approximately 80 million metric tonnes per year.

The Kigali Amendment is a significant opportunity for us to live up to the promise of better environment. Successful implementation of the amendment will require a high level of national cooperation from our government, along with industry, research institutes and regulators coming together in sustaining efforts. While daunting in several ways, the positive prospect of technology cost reductions, a cleaner and healthier environment, along with improvements in quality of life, can all support a world of increasing action on climate change. India has been a key partner in the quest for reducing emissions and should continue to take the lead in efforts to protect the planet from climate change.

Financial Express, 22 April 2019, By Rajarshi Datta

14. Record 25-tonne seizure in Poland of illegal climate-harming HFC refrigerants

Polish authorities have seized nearly 25 tonnes of illegal hydrofluorocarbon (HFC) refrigerants.

Believed to be the largest seizure of its kind in Europe, the 24,459kg shipment from Ukraine included cylinders of R-134a, R-404A and R-410A and is estimated to be worth about €600,000.

Tax Administration Chamber officers, in Łódź, discovered the HFCs during customs clearance of two consignments.

HFCs are a family of synthetic chemicals hundreds to thousands of times more potent than carbon dioxide and commonly used in refrigeration, air-conditioning, fire protection, aerosols and foams.

World-leading EU legislation in place since 2015 is gradually reducing the amounts that can legally be placed on the market.

Clare Perry, our Climate Campaigns Leader, said: "This is the visible tip of the iceberg of what is becoming a major problem for the EU.

"The swiftly increasing illegal trade in HFC refrigerants is seriously undermining the EU's attempts to phase down HFC use under its revised F-gas Regulation as part of its strategy to tackle climate change.

"We commend the Polish authorities for this seizure, urge them to apply penalties that will deter future illegal traders and look to other EU member states to step up enforcement against this pernicious criminal trade."

Environmental Investigation Agency, 5 April, 2019



Enforcement officers in Łódź examine the seized HFCs

See also >>>

- [Bulgarian customs seize over a tonne of illegal HFCs](#)
- [Valencia company investigated over illegal R22 exports](#)
- [L'Europe touchée par un vaste trafic de HFC, des gaz réfrigérants 15 000 fois plus néfastes que le CO₂](#)

15. Environmental Impact Of Refrigerants - Report by The Consumer Goods Forum (CGF)

The Consumer Goods Forum (CGF) has published a new report that explores the impact of refrigerants on the environment, and outlines the challenges in implementing hydrofluorocarbon-free cooling systems.

The report 'Understanding the Most Cost-Effective Way to Fight Climate Change' was developed in partnership with Shecco, a company that provides eco-friendly heating, cooling and refrigeration solutions.

It also explains the benefits of using eco-friendly cooling technologies along with case studies from companies that have switched to natural refrigerants.

'Success Stories'

Some of the success stories included in the report are that of CGF members such as Campbell Soup, Carrefour, Heineken, Lawson, METRO AG, Recheio (Jeronimo Martins) and Woolworths.

Environmental sustainability director at the Consumer Goods Forum, Ignacio Gavilan, said, "Our members continue to be at the forefront of change. [...] We bring together consumer goods retailers, manufacturers, and their stakeholders globally to address these key topics."

"Thanks to the actions of these leading retailers and manufacturers, we now have a much better understanding of the HFC-challenge and how we can drive positive change and phase out these harmful, chemical refrigerants," Gavilan added.



Challenges

The report identifies initial investments, lack of trained technicians and energy-efficient solutions for warmer climates as primary challenges in implementing eco-friendly cooling solutions.

Shecco CEO, Marc Chasserot, said, "The transition towards long-term future-proof natural refrigerant-based technologies is often not without challenges."

"Nevertheless, learning from the experience of others can be an effective way to overcome the barriers as well as avoid unnecessary intermediary steps," Chasserot pointed out.

Greenhouse Emissions

Refrigerants such as hydrofluorocarbons (HFCs) contribute massively to greenhouse gas emissions across the world.

In 2010, the CGF's members made a commitment to tackle the growing impact of refrigeration systems.

Six years later, in October of 2016, CGF's board announced a second Refrigeration Resolution to continue the process of phasing out HFCs and call for its inclusion in the Montreal Protocol.

European Supermarket Magazine, 26 April 2019

Featured



OZONE SECRETARIAT

- [62nd Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol](#), 29 June 2019, Bangkok, Thailand
- [41st Meeting of the Open-Ended Working Group of the Parties to the Montreal Protocol](#), 1 - 5 July 2019, Bangkok, Thailand
- [63rd Meeting of the Implementation Committee under the Non-Compliance Procedure of the Montreal Protocol](#), 2 November 2019, Rome, Italy
- [Bureau Meeting of the 30th Meeting of the Parties to the Montreal Protocol](#), 3 November 2019, Rome, Italy
- [31st Meeting of the Parties to the Montreal Protocol](#), 4 - 8 November 2019, Rome, Italy

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

Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Status of Ratification 15 October 2016 to [date](#)

The UN Environment Assessment Panels

The Assessment Panels have been vital components of ozone protection since the Montreal Protocol was first established. They support parties with scientific, technological and financial information in order to reach decisions about ozone layer protection and they play a critical role in ensuring the Protocol achieves its mandate.

The Assessment Panels were first agreed in 1988 to assess various direct and indirect impacts on the ozone layer. The original three panels are:

[The Technology and Economic Assessment Panel](#)

[The Scientific Assessment Panel](#)

[The Environmental Effects Assessment Panel](#)

In the past there were 4 main panels. The Panels for Technology and Economic Assessments were merged in 1990 into one Panel, now called the Technology and Economic Assessment Panel.

Why are the three current panels important to ozone layer protection? Each carries out assessment in its respective field. Every four years, the key findings of all panels are consolidated in a synthesis report.



THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

- 83rd meeting of the Executive Committee
- 82nd meeting of the Executive Committee

[Learn more](#)

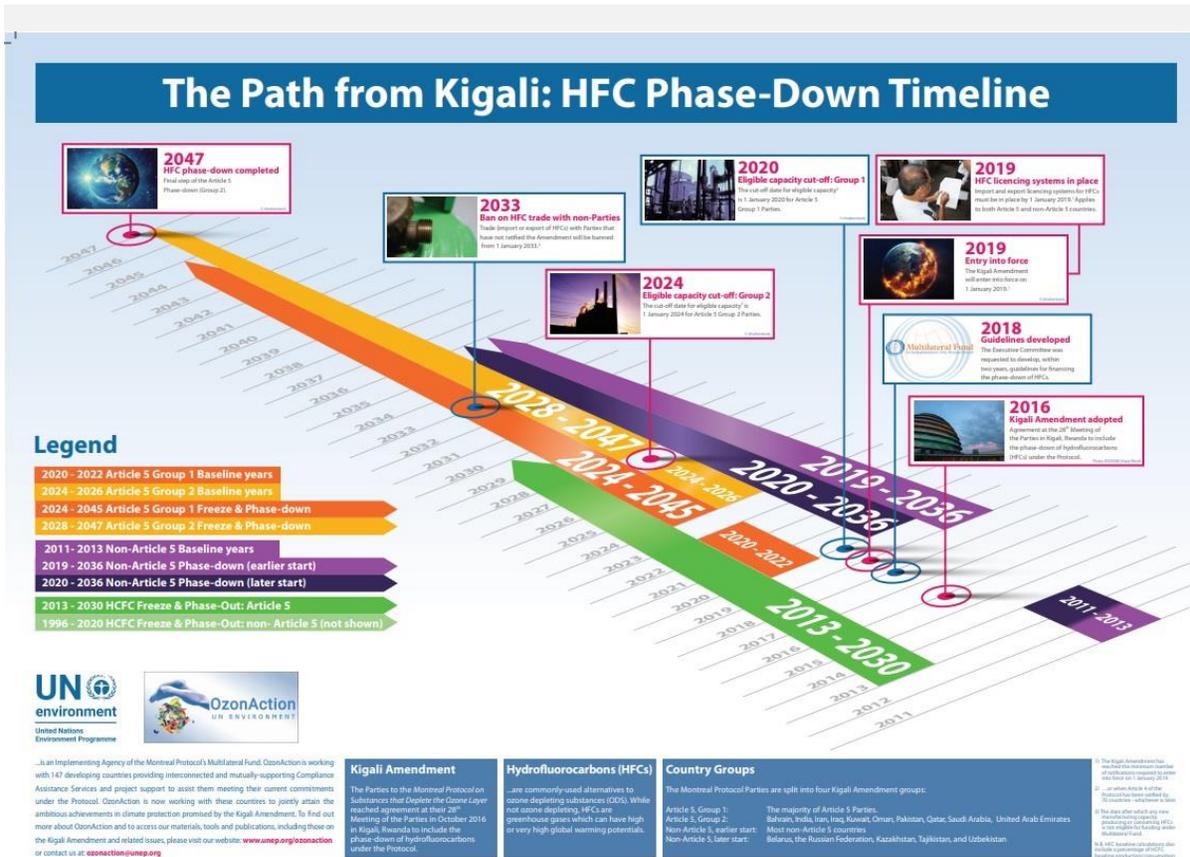


OZONACTION

Post-Meeting Feedback Survey - OzonAction Second Global Inter-Regional and Parallel Network Meetings for National Ozone Officers, 17-20 February 2019.

Read/Download: [Meeting report](#) | [Full survey report](#)

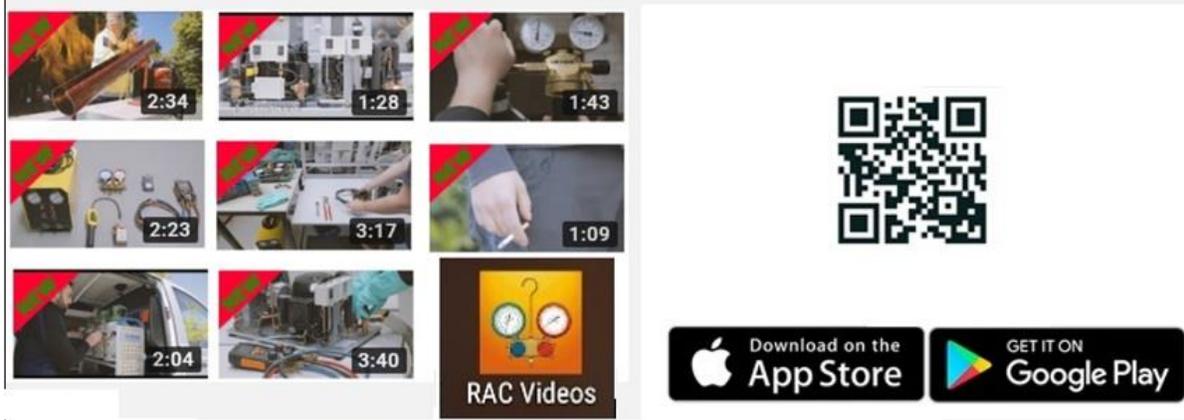
Question / Statement	Response Rate (%)
1. How satisfied are you with the progress of the 2019-2020 phase-down of HFCs?	85
2. How satisfied are you with the progress of the 2020-2022 phase-down of HFCs?	88
3. How satisfied are you with the progress of the 2022-2024 phase-down of HFCs?	81
4. How satisfied are you with the progress of the 2024-2026 phase-down of HFCs?	84
5. How satisfied are you with the progress of the 2026-2028 phase-down of HFCs?	79
6. How satisfied are you with the progress of the 2028-2047 phase-down of HFCs?	82



The Path from Kigali: HFC Phase-Down Timeline

This timeline, produced by OzonAction, highlights key hydrofluorocarbons (HFCs) phase-down dates.

Click [here](#) to download the timeline



New videos available on the OzonAction RAC video application

A series of new videos has just been released on the Refrigeration and Air-conditioning Technician Video Series application, with a focus on working with flammable refrigerants ...

50,000 downloads and counting!

To install, search for "RAC Video" in the Google Playstore or Apple IOS store, or scan the QR code.



GWP-ODP Calculator Smartphone Application

The application allow you to easily convert ODP, CO₂-eq and metric quantities of refrigerants and other chemicals.

- Helps in understanding and reporting under the Montreal Protocol (and future commitments under the Kigali Amendment)
- The calculator will automatically perform the conversion between metric tonnes, ODP tonnes and/or CO₂-equivalent tonnes (or kg) and display the

corresponding converted values

- The app includes both single component substances and refrigerant blends
- The components of a mixture and their relative proportions (metric, ODP, CO₂-eq) are also displayed.

Available for free from the Apple IOS store and Google PlayStore. Search for "GWP ODP CALC" in the Playstore to install!

Download it Now!



OzonAction Smartphone Application WhatGas? Quickly search for the information you need

- Chemical name
- Chemical formula
- Chemical type
- ASHRAE designation
- Trade names
- HS code
- CAS number
- UN number
- Montreal Protocol Annex and Control measures
- Ozone depleting potential (ODP)
- Global warming potential (GWP)
- Blend components
- Toxicity and flammability class
- Main uses

OzonAction Smartphone Application WhatGas?

Available for **free** in the Google Play and Apple IOS Store

Scan the QR code or search for “UNEP”, “OzonAction” or “WhatGas?”



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

The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached agreement at their 28th Meeting of the Parties on 15 October 2016 in Kigali, Rwanda to phase down hydrofluorocarbons (HFCs). The UN Environment, OzonAction developed a video to find out from renowned international scientific, health, technical, financial and national experts about background and significance of this Kigali amendment.

The amendment presents many opportunities: improving the environment, refrigeration and air-conditioning systems and especially energy efficiency. It also presents new challenges. It is absolutely critical now for industry, governmental bodies and civil society to work together to adopt greener technologies in each country of the world and fight global warming.

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

OzonAction Factsheets



UN Environment-ASHRAE Factsheet Update on New Refrigerants Designations and Safety Classifications

OzonAction Series of 19 Fact Sheets related to the Kigali Amendment.

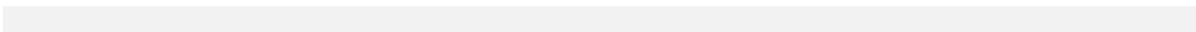
HS codes for HCFCs and certain other Ozone Depleting Substances ODS (post Kigali update).

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).

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

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

Tools Commonly used by Refrigeration and Air-Conditioning Technicians.





OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series - Over 50,000 downloads to date -

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.

New videos on flammable refrigerants just added!

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

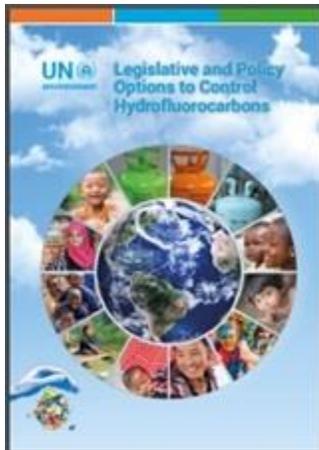
OzonAction Multimedia Video Application: Refrigeration and Air-conditioning

Technician Video Series

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

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

Publications



Legislative and Policy Options to Control Hydrofluorocarbons

In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures.

This booklet contains a recommended set of legislative and policy options which the developing (Article 5) countries may wish to consider for implementation. It is intended to be a guide/tool for countries.



Latest issue of the Centro Studi Galileo - [Industria & Formazione](#). La rivista per il tecnico della refrigerazione e della climatizzazione, N. 2, 2019

Events

2019

- [25th IIR International Congress of Refrigeration](#) - 24-30 August 2019, Montreal, Canada

Click [here](#) for more information / [International Institute of Refrigeration](#)

Please feel free to [share with us](#) relevant events.

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.

Lead Author:

Michaela I. Hegglin

Coauthors:

David W. Fahey, Mack McFarland, Stephen A. Montzka, Eric R. Nash



Primer on Hydrofluorocarbons (HFCs) - IGSD -11 January 2018

Summary:

Fast action under the Montreal Protocol can limit growth of hydrofluorocarbons (HFCs), prevent 100 to 200 billion tonnes of CO₂-eq by 2050, and avoid up to 0.5°C of warming by 2100.

Lead authors:

Durwood Zaelke, Nathan Borgford-Parnell, and Stephen O. Andersen.

Contributing authors:

Kristin Campbell, Xiaopu Sun, Dennis Clare, Claire Phillips, Stela Herschmann, Yuzhe Peng Ling, Alex Milgroom, and Nancy J. Sherman.



The [IIR International Dictionary of Refrigeration](#) Available in 11 languages, the complete version of the International Institute of Refrigeration (IIR) International Dictionary of Refrigeration is now freely accessible online. The IIR International Dictionary of Refrigeration offers researchers, industrialist or administrations the practical resources required to produce content related to

refrigeration technologies in multiple languages.

This online tool allows you to find definitions, in English and French, of scientific and technical terms, as well as identify terms in the language of your choice and find corresponding translations in the 10 other languages.

The dictionary provides term searches in Arabic, Chinese, Dutch, English, French, German, Italian, Japanese, Norwegian, Russian and Spanish.

Access the International Dictionary of Refrigeration on the [IIR website](#)



Impact of Standards on Hydrocarbon Refrigerants in Europe – Market research report.

The market research report was realised for the EU-funded [LIFE FRONT](#) project. Amongst the main result of the market research:

- Current charge limits set in standards both restrict and obstruct the development of hydrocarbon technology
- Over 50% survey respondents already work with hydrocarbons to some extent
- Most of those planning to start working with hydrocarbons in the future will do that in 2019-2020 timeframe - revision of standards could have a major impact on the scale of this shift
- Large proportion of respondents indicated they manufacture equipment using multiple refrigeration circuits - allowing higher hydrocarbon charge limits per single refrigeration circuit would have a profound impact on cost and availability

of larger units.



[Tip of the Iceberg: Implications of Illegal CFC Production and Use](#). The Environmental Investigation Agency (EIA) recently released report urges Parties to the Montreal Protocol to address a number of remaining unanswered questions, in particular the absence of comprehensive data regarding the size of current banks of CFC-11 in PU foam and other products or equipment.



[Cold Hard Facts 3 - Review of the Refrigeration and Air Conditioning Industry in Australia](#) - The refrigeration and air conditioning industry is the largest user of synthetic greenhouse gases and ozone depleting substances in Australia. Cold Hard Facts 3 provides an economic and technological assessment of the refrigeration and air conditioning industry in Australia in 2016. The report includes an analysis of the size and economic value of the industry, the equipment and refrigerant gas bank, trends in gas imports and equipment, and direct and indirect emissions in this sector. [...] This study provides a broad view of the composition, size and value of the industry, and projections for its future. This will assist industry and policy makers with management of ozone depleting substances as they are phased out, and synthetic greenhouse gases, including hydrofluorocarbons (HFCs) which are being phased down from January 2018.

Miscellaneous



I am in the Montreal Protocol Who's Who... Why Aren't You?

The United Nations Environment, OzonAction, in collaboration with Marco Gonzalez and Stephen O. Andersen are updating and expanding the "Montreal Protocol Who's Who".

We are pleased to invite you to submit your nomination*, and/or nominate

Ozone Layer Champion(s). **The short profile should reflect the nominee's valuable work related to the Montreal Protocol and ozone layer protection.**

Please notify and nominate worthy candidates through the [on-line form](#)

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

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

- View the «Montreal Protocol Who's Who» [Introductory video](#)
- Contact : [Samira Korban-de Gobert](#), UN Environment, OzonAction

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



The International Institute of Refrigeration supports World Refrigeration Day -
As the only independent intergovernmental organisation in the field of refrigeration, the International Institute of Refrigeration (IIR) joins associations and companies worldwide to support the initiative of an official

World Refrigeration Day on 26 June every year. The annual World Refrigeration Day, to be launched on 26 June 2019, aims to raise awareness among the wider public about the importance of refrigeration technologies in everyday life.

Refrigeration is essentially a question of temperature and, as such, it only seems natural to celebrate the field on the birthday of the pioneer at the origin of the international unit of temperature, Lord Kelvin (Sir William Thomson) – born 26 June 1824.

With increasing global stakes at hand, over the past years refrigeration has come to take a leading role at the heart of international affairs.

The inauguration of a World Refrigeration Day would not only be an ideal way to recognise the many historical achievements of the industry, but also a means to anticipate and overcome together the challenges we face. ... Click [here](#) for more information.



New International Journal of Refrigeration service for IIR members -
Access 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.
 - Keep up-to-date with subscriptions to customized e-alerts on New Volumes, Topics and saved Searches.
- Enhanced content and functions
- Easily export references, citations and abstracts.
 - Print, download or share articles with colleagues or peers.
 - See which papers, published in Elsevier or elsewhere, have cited any selected article.
 - 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



OZONE HOLE: HOW WE SAVED THE PLANET - New Documentary Tells the Remarkable Story of How Scientists Discovered the Deadly Hole in the Ozone – and the **Even More Remarkable Story of How the World's Leaders Came Together to Fix It.**



Million Cool Roofs Challenge - The Million Cool Roofs Challenge is a \$2 million global competition to rapidly scale up the deployment of highly solar-reflective "cool" roofs in developing countries suffering heat stress and lacking widespread access to cooling services.

The Challenge will award \$100,000 grants to up to ten teams this year to deploy solar reflective coating and/or materials in an eligible country between August 2019 and December 2020. From there, \$1 million will be awarded in 2021 to the team that has demonstrated the best sustainable and transferable model for rapid deployment of cool roofs in an eligible country and best meets the judging criteria. Materials should also meet minimum performance standards and be applied to roofs of buildings regularly occupied by people.

The application window for \$100,000 grants is now open. Applicants must submit their completed entry forms by 20 May 2019. Before applying to the Challenge, applicants must carefully review all of the information on the **Apply** page.

The Million Cool Roofs Challenge is a project of the Kigali Cooling Efficiency Program (K-CEP) in collaboration with the Global Cool Cities Alliance, Sustainable Energy for All and Nesta's Challenge Prize Centre.

The recent paper by SEforAll and K-CEP, Chilling Prospects: Providing Sustainable Cooling For All, directly linked strategies to deploy more highly reflective "cool" roofs and walls with achieving the goals of the Paris climate agreement, the Sustainable Development Goals, and the Kigali Amendment to the Montreal Protocol.

By minimizing the amount of heat generated by solar energy absorbed by buildings, reflective building surfaces reduce the demand for cooling energy for those that can afford it while also providing a sustainable passive cooling solution for the billions of people who do not have the economic means to access mechanical cooling options, in poor rural areas, urban slums and homeless shelters.

Reflective roof surfaces not only have an impact on individual buildings, but deploying them across a whole community can have a net effect on reducing local ambient temperatures. Further, the deployment of reflective materials creates sustainable job and skills opportunities for low skilled workers in both rural and urban contexts.

Learn more, see a full list of eligible countries, and apply to the Challenge please visit www.coolroofschallenge.org
Contact: team@coolroofschallenge.org

New program to scale up efficient, clean cooling in developing countries- The World Bank announced today [24 April 2019] a new program to accelerate the uptake of sustainable cooling solutions, including air conditioning, refrigeration and cold chain in developing countries. The program will provide technical assistance to ensure that efficient cooling is included in new World Bank Group investment projects and mobilize further financing. Globally, demand for cooling is increasing, mainly driven by growing populations, urbanization and rising income levels in developing countries. Further exacerbating the issue, rising temperatures will increase demand for cooling appliances, which not only use large amounts of energy, but also leak refrigerants that contribute to global warming.



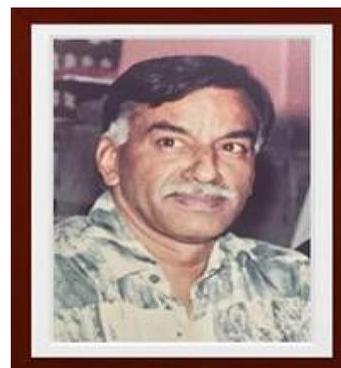
Ozone Depletion Explained --- The ozone layer's status today

- Recognition of the harmful effects of CFCs and other ozone-depleting substances led to the Montreal Protocol on Substances That Deplete the Ozone Layer in 1987, a landmark agreement to phase out those substances that has been ratified by all 197 UN member countries. Without the pact, the U.S. would have seen an additional 280 million cases of skin cancer, 1.5 million skin cancer deaths, and 45 million cataracts—and the world would be at least 25 percent hotter...



Mani Subramanian **A tribute to a life truly and fully lived**

Mani Subramanian who died on 24 March 2019 was the first Fund Management and Administrative Officer of the Multilateral Fund Secretariat. Based on his experience, his knowledge of the United Nations system, and most of all his interpersonal skills, Mani had been selected to carry out a short mission to help establish and operationalize the recently established interim Multilateral Fund for the Implementation of the Montreal Protocol.



He arrived in Montreal on 10 February 1991 on the same day as the first Chief Officer of the Fund, Dr. Omar E. El-Arini. Within a year of his arrival Mani had proved himself invaluable. The administrative and financial infrastructure of the interim Multilateral Fund was in place and the staffing structure of the Secretariat had been finalized. Mani played a key role in recruiting 11 candidates from all corners of the globe to bring the fledgling Secretariat staff to a total of thirteen allowing the Fund Secretariat to begin its work. Mani thus played a key role in initiating the operation of the Multilateral Fund which was to remove barriers to technology change, incentivize industry to develop alternatives to ozone depleting substances, and assist countries to develop national goals and plans to switch to ozone friendly alternatives.

Recognizing Mani's value to the Multilateral Fund, then the Chief Officer strongly requested him to stay. Fortunately, he accepted and became the first Fund and Administrative Officer of the Fund Secretariat until his retirement in 2002. Establishing and operating a new Secretariat was not a simple task and required long working hours not only in the initial period but in the months and years that followed. Despite the demands on him, Mani always found time to solve any problem that was brought to his attention, no matter how small and simple or complicated it was. He always provided a sound, speedy solution delivered it with a smile.

During his tenure, all members of the Executive Committee, the representatives of the implementing agencies as well as representatives from the Governments of Canada and Quebec respected and trusted him.

Mani's administrative and negotiating skills together with his selflessness, generosity, approachability and openness resulted in the infrastructure and operating systems of the Secretariat that we know today, and which are still the embodiment of the Multilateral Fund. The Multilateral Fund and its Secretariat owe their renowned success and stellar reputation to the experience, vision, demeanour and wisdom of our dear Mani.

We are profoundly saddened by the news of his passing but remember our good fortune to know and love him. Each day we spent with Mani was a gift.

Mani, our dearest friend and colleague, may your soul rest in peace.

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