

OzoNews

A fortnightly electronic news update on ozone and climate protection and the implementation of the Montreal Protocol brought to you by OzonAction

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GLOBAL

1. Kigali Amendment latest ratifications

Congratulations to the latest countries which have ratified the Kigali Amendment:

[Syrian Arab Republic, 5 April 2021](#)

[Cambodia, 8 April 2021](#)

[Dominican Republic, 14 April 2021](#)



At the Twenty-Eighth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, held in Kigali from 10 to 15 October 2016, the Parties adopted, in accordance with the procedure laid down in paragraph 4 of article 9 of the 1985 Vienna Convention for the Protection of the Ozone Layer, a further amendment to the Montreal Protocol as set out in Annex I to the report of the Twenty-Eighth Meeting of the Parties (Decision XXVIII/1).

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

[United Nations Treaty Collection](#)

Image: UN Treaty Collection website

2. ASHRAE and UN Environment Programme Launch Three-Year Workplan

ATLANTA (April 15, 2021) – ASHRAE and the United Nations Environment Programme (UNEP) announced the launch of its 2021-23 workplan. The workplan's theme is “*Refrigeration Management for Developing Economies*” and was signed by Charles E. Gullede III, P.E., 2020-21 ASHRAE President and James S. Curlin, Acting Head of UNEP OzonAction Programme.



In 2007, ASHRAE and UNEP OzonAction, signed an agreement aimed at promoting the adoption of state-of-art technologies and practices in developing countries, that avoid the use of ozone depleting substances and promote the deployment of lower global warming potential (Lower-GWP) refrigerants. The two global organizations also worked to offer tools and knowledge to help in eliminating emissions of refrigerants while servicing refrigeration and air conditioning applications. Both parties renewed their commitment of the continuing strategic partnership through a new umbrella MOU signed in 2019, replacing the original 2007 agreement. This is the fifth joint workplan.

The theme of the workplan recognizes the important role that refrigeration and air conditioning play in developing countries both in terms of societal benefits, ranging from

protecting the food supply and vaccine storage to cooling for increased comfort and productivity, as well as environmental goals, including compliance with international commitments. The workplan emphasizes the deployment of all ASHRAE-UNEP developed tools and programs, to make them reachable and accessible to different stakeholders in developing countries.

“One of the most important elements of ASHRAE’s work plan with UNEP is our collective ability to contribute meaningful resources to the critically important challenge of shifting to the use of refrigerants with lower global warming potential,” said Gulledge “We are delighted to continue our work with UNEP as we share knowledge and expertise to prioritizing the adoption of energy efficient solutions that lessen the impact of ozone depletion.”

“By offering a suite of state-of-art products and services, UNEP OzonAction and ASHRAE are helping to connect industry and policy-makers in developing countries to enhance environmental performance in the critical refrigeration and air conditioning sector. This partnership helps those countries meet their international commitments and ultimately to realize the Sustainable Development Goals (SDGs),” said Curlin. “The successful ASHRAE-UNEP cooperation model has helped us, UNEP OzonAction, to build similar meaningful partnerships with other organizations and associations.”

All ASHRAE-UNEP products and services included in the joint workplans are offered free of charge and are accessible to National Ozone Units (NOUs) and certain refrigeration and air conditioning sector stakeholders in developing countries through ASHRAE and UNEP OzonAction.

To view the complete work plan, please visit >>> [ASHRAE UNEP Portal](#)

Contact:

[Ayman Eitalouny](#), OzonAction, UN Environment Programme

[Karen Buckley Washington](#), ASHRAE Public Relations Specialist

Image: ASHRAE UNEP Portal

3. Climate crisis: 2075 could be the year the ocean starts emitting harmful gases

- The ocean could become a source of ozone-depleting chlorofluorocarbons by 2075, according to new research.
- At the moment, the ocean absorbs the chlorofluorocarbons or CFCs from the atmosphere sequestering them for centuries.



The ocean has long been a repository for gases. Image: REUTERS/Kathryn Hansen/USAA

- But soon, it could reverse its longtime role as a sink for these chemicals, further worsening the climate crisis.

The world's oceans are a vast repository for gases including ozone-depleting chlorofluorocarbons, or CFCs. They absorb these gases from the atmosphere and draw them down to the deep, where they can remain sequestered for centuries and more.

Marine CFCs have long been used as tracers to study ocean currents, but their impact on atmospheric concentrations was assumed to be negligible. Now, MIT researchers have found the oceanic fluxes of at least one type of CFC, known as CFC-11, do in fact affect atmospheric concentrations. In a study appearing today in the *Proceedings of the National Academy of Sciences*, the team reports that the global ocean will reverse its longtime role as a sink for the potent ozone-depleting chemical.

The researchers project that by the year 2075, the oceans will emit more CFC-11 back into the atmosphere than they absorb, emitting detectable amounts of the chemical by 2130. Further, with increasing climate change, this shift will occur 10 years earlier. The emissions of CFC-11 from the ocean will effectively extend the chemical's average residence time, causing it to linger five years longer in the atmosphere than it otherwise would. This may impact future estimations of CFC-11 emissions.

The new results may help scientists and policymakers better pinpoint future sources of the chemical, which is now banned worldwide under the Montreal Protocol.

"By the time you get to the first half of the 22nd century, you'll have enough of a flux coming out of the ocean that it might look like someone is cheating on the Montreal Protocol, but instead, it could just be what's coming out of the ocean," says study co-author Susan Solomon, the Lee and Geraldine Martin Professor of Environmental Studies in MIT's Department of Earth, Atmospheric and Planetary Sciences. "It's an interesting prediction and hopefully will help future researchers avoid getting confused about what's going on."

Solomon's co-authors include lead author Peidong Wang, Jeffery Scott, John Marshall, Andrew Babbin, Megan Lickley, and Ronald Prinn from MIT; David Thompson of Colorado State University; Timothy DeVries of the University of California at Santa Barbara; and Qing Liang of the NASA Goddard Space Flight Center.

An ocean, oversaturated

CFC-11 is a chlorofluorocarbon that was commonly used to make refrigerants and insulating foams. When emitted to the atmosphere, the chemical sets off a chain reaction that ultimately destroys ozone, the atmospheric layer that protects the Earth from harmful ultraviolet radiation. Since 2010, the production and use of the chemical has been phased out worldwide under the Montreal Protocol, a global treaty that aims to restore and protect the ozone layer.

Since its phaseout, levels of CFC-11 in the atmosphere have been steadily declining, and scientists estimate that the ocean has absorbed about 5 to 10 percent of all manufactured CFC-11 emissions. As concentrations of the chemical continue to fall in the atmosphere, however, it's predicted that CFC-11 will oversaturate in the ocean, pushing it to become a source rather than a sink.

“For some time, human emissions were so large that what was going into the ocean was considered negligible,” Solomon says. “Now, as we try to get rid of human emissions, we find we can’t completely ignore what the ocean is doing anymore.”

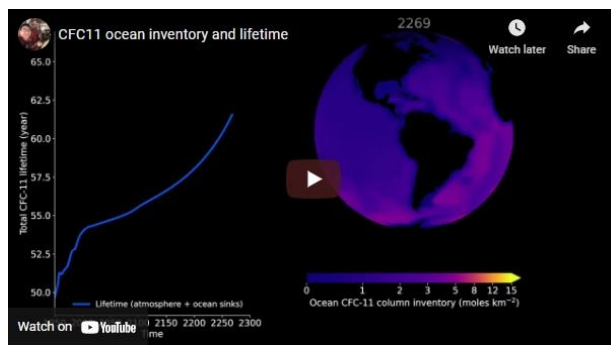
A weakening reservoir

In their new paper, the MIT team looked to pinpoint when the ocean would become a source of the chemical, and to what extent the ocean would contribute to CFC-11 concentrations in the atmosphere. They also sought to understand how climate change would impact the ocean’s ability to absorb the chemical in the future.

The researchers used a hierarchy of models to simulate the mixing within and between the ocean and atmosphere. They began with a simple model of the atmosphere and the upper and lower layers of the ocean, in both the northern and southern hemispheres. They added into this model anthropogenic emissions of CFC-11 that had previously been reported through the years, then ran the model forward in time, from 1930 to 2300, to observe changes in the chemical’s flux between the ocean and the atmosphere.

They then replaced the ocean layers of this simple model with the MIT general circulation model, or MITgcm, a more sophisticated representation of ocean dynamics, and ran similar simulations of CFC-11 over the same time period.

Both models produced atmospheric levels of CFC-11 through the present day that matched with recorded measurements, giving the team confidence in their approach. When they looked at the models’ future projections, they observed that the ocean began to emit more of the chemical than it absorbed, beginning around 2075. By 2145, the ocean would emit CFC-11 in amounts that would be detectable by current monitoring standards.



The ocean’s uptake in the 20th century and outgassing in the future also affects the chemical’s effective residence time in the atmosphere, decreasing it by several years during uptake and increasing it by up to 5 years by the end of 2200.

Climate change will speed up this process. The team used the models to simulate a future with global warming of about 5 degrees Celsius by the year 2100 and found that climate change will advance the ocean’s shift to a source by 10 years and produce detectable levels of CFC-11 by 2140.

“Generally, a colder ocean will absorb more CFCs,” Wang explains. “When climate change warms the ocean, it becomes a weaker reservoir and will also outgas a little faster.”

“Even if there were no climate change, as CFCs decay in the atmosphere, eventually the ocean has too much relative to the atmosphere, and it will come back out,” Solomon adds. “Climate change, we think, will make that happen even sooner. But the switch is not dependent on climate change.”

Their simulations show that the ocean's shift will occur slightly faster in the Northern Hemisphere, where large-scale ocean circulation patterns are expected to slow down, leaving more gases in the shallow ocean to escape back to the atmosphere. However, knowing the exact drivers of the ocean's reversal will require more detailed models, which the researchers intend to explore.

"Some of the next steps would be to do this with higher-resolution models and focus on patterns of change," says Scott. "For now, we've opened up some great new questions and given an idea of what one might see."

This research was supported, in part, by the VoLo Foundation, the Simons Foundation, and the National Science Foundation.

[The World Economic Forum, 19 March 2021, By: Jennifer Chu, Guest Contributor, MIT News](#)

Image: The World Economic Forum website

[See the original article >>>](#)

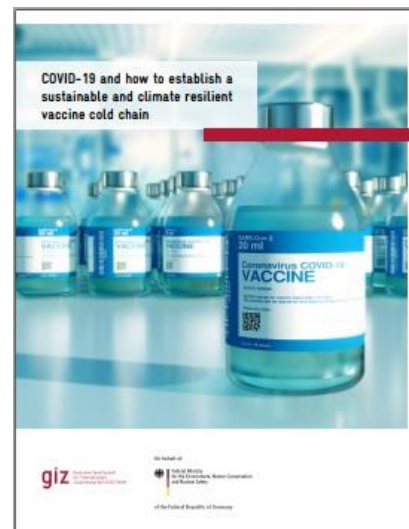
[On the effects of the ocean on atmospheric CFC-11 lifetimes and emissions.](#) *Proceedings of the National Academy of Sciences.*

4. COVID-19 and how to establish a sustainable and climate resilient vaccine cold chain - *New publication*

Most conventional technologies for vaccine cooling and freezing use climate-damaging hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs) as refrigerants. In addition, these devices often have relatively low energy efficiency. However, climate-friendly and energy-efficient technologies for inoculant cooling that use refrigerants and blowing agents with very low GWP are already available today. This publication is intended to provide guidance on the procurement of climate-friendly and energy-efficient refrigeration and freezing technology.

Introduction:

Cooling or freezing equipment for vaccines and the vaccine cold chain itself are quite complex in developed and especially in developing countries. The pandemic COVID-19 (SARS-CoV-2) represents a unique challenge globally, not only economically, but also logistically. Distributing the vaccine to preferably 70 percent of the global population within a short time frame of around 2-3 years is seen by many as the largest refrigeration project ever in history.



With the successes of Moderna's mRNA-1273 vaccine, University of Oxford, and AstraZeneca's AZD1222 vaccines and other vaccines to follow in the near future, it seems that a large part of the global vaccine cold chain requires temperatures that are in the temperature range of current conventional vaccines. However, the BioNTech-Pfizer BNT162 vaccine requires temperatures of -70°C. Many countries already purchased millions of doses of it, meaning they will also need to have the required cold chain in place.

Although many countries do have an existing cold chain for conventional vaccines, even these cold chains are not prepared to vaccinate up to 70 percent of the total population mostly twice within a few weeks (apart from Johnson & Johnson) and maybe even a third time after within a longer time frame. Consequently, most countries require quick improvements of their cold chains for vaccines and therefore will need to purchase thousands of new facilities and equipment soon.

Nevertheless, most conventional vaccine cooling and freezing technologies use high Global Warming Potential (GWP) Hydrochlorofluorocarbon (HCFC)/ Hydrofluorocarbon (HFC) refrigerants. Moreover, this equipment has often a relatively low energy efficiency. In contrast, climate-friendly and energy-efficient vaccine cooling and freezing technologies which use ultra-low GWP climate-friendly refrigerants and blowing agents are available.

Green Cooling and Freezing technologies are defined in this publication as the following:

- They use ultra-low GWP (<10) refrigerants, preferably natural refrigerants such as hydrocarbons (HCs).
- They contain insulation materials that are produced with ultra-low GWP (<12) and zero Ozone Depletion Potential (ODP) blowing agents, preferably natural refrigerants.
- They have a high Energy Efficiency Ratio (EER) or low energy consumption per 24hours/annually and use preferably inverter technology.
- Additionally, they can be powered or backed up by renewable energy sources such as solar energy.

Some people argue that what is now urgently required is to improve the cold chain and that there is no time and no priority to consider climate and environmental aspects. However, this publication is arguing to use this moment to establish a smart, sustainable, green and climate-friendly system for the future, which is aligned and consistent with multilateral agreements. The procurement of thousands of cold chain equipment can also be seen as a chance for green recovery and climate resilience.

Consequently, this publication aims to provide guidance regarding the procurement of climate-friendly and energy-efficient vaccine cooling and freezing technology solutions.

Additionally, this publication focuses on aspects related to standards, training, certification, digitalisation, recycling or destruction of obsolete equipment, cost saving, sustainability, and climate change mitigation potential.

[Deutsche Gesellschaft für Internationale Zusammenarbeit \(GIZ\) GmbH, April 2021](#)

Image: GIZ



5. World Refrigeration Day announces theme of 2021 campaign

“Cooling Champions: Cool Careers for a Better World”

World Refrigeration Day celebrates the people and technologies responsible for creating and maintaining the world we live in, a world dependent upon temperature-controlled environments. Centered around June 26, the event is supported globally by industry, professional groups, scientific and engineering

associations, as well as by governments and individuals.

The WRD 21 campaign will focus on careers in the refrigeration, air-conditioning and heat pumps industry and is titled **“Cooling Champions: Cool Careers for a Better World”**. The goal of the campaign is to inspire students and young professionals – for both men and women – in all countries, encouraging them to meet the challenges faced in their communities.

Following successful campaigns in the last two years, the WRD Secretariat will continue partnering with UNEP OzonAction in the WRD 21 campaign to attract a new generation of Cooling Champions. The campaign includes other partners representing the industry and professionals around the world. The full list of partners and the campaign program will be announced in the coming weeks.

Refrigeration is at the very heart of modern life. More than 15 million people are employed worldwide in the refrigeration sector. The total number of refrigeration, air-conditioning and heat-pump systems in operation worldwide is around 5 billion. Those systems provide the conditions we require for health, comfort, worker productivity, manufacturing, and essential environments for food, pharmaceuticals, and digital data. Dedicated professionals design, build, maintain, and regulate them as well as educate a new generation of practitioners.

Opportunities within the industry abound for young people with a wide range of career aspirations. Advanced cooling technologies need to be implemented in order to expand life required environmental conditions while meeting sustainability requirements of international climate and ozone protection accords. A new generation of cooling champions – engineers, technicians, researchers, educators, policy experts and executives – are needed to create controlled environments modern life requires. The benefits of reaching into a wide diversity of communities for promising talent will be a high campaign priority.

To support the Cooling Champions Campaign contact: info@worldrefrigerationday.org

[World Refrigeration Day 26th June around the World](#)

Image: WRD

6. Video: Refrigerant gas sensor detects leaks in diverse applications

[...] “Nearly 200 countries around the world have resolved to eliminate ozone-depleting hydrofluorocarbons refrigerants with high global warming potential (GWP),” said Bob Christensen, senior director of business development, NevadaNano Inc. “R-290, a high-performance natural refrigerant with very low-GWP, is an alternative that is quickly gaining widespread acceptance and use in Asia, Europe and the U.S. And, when used with accurate leak detection systems, it is a safe alternative.”



Growing populations and global warming have led to a continuous rise in demand for air conditioning and refrigeration, which results in higher greenhouse gas emissions. The industry is transitioning away from high GWP refrigerants and moving toward alternatives such as R290 (propane) with a GWP of three versus R410 with a GWP of over 3900. Many nations and corporations are making this change now, ahead of the current hydrofluorocarbon phase-down schedule as stipulated in the Kigali amendment to the Montreal Protocol.

Under normal operation, R-290 units are fully sealed and self-contained, however leaks can occur. If leaks occur and they are exposed to an ignition source they can cause a fire. Even smaller, non-explosive leaks need detection since the reduction in the quantity of refrigerant causes the unit to work harder, consuming excessive electrical power, driving up costs and subsequent impact on the environment. The reliable and accurate MPS sensors help detect even the smallest leaks and send instant alerts.

The MPS propane sensor accurately reports 0% to 100% lower explosive limit and requires no field maintenance over their expected lifetime of 10 to 15 years. The MPS sensors feature integrated, real-time measurements and built-in environmental compensation for temperature, pressure and humidity. In addition, they are inherently immune to drift, decay or poison from contaminants.

[Electronics360 News Desk, 2 May 2021](#)

Image: Electronics360 website

ASIA AND THE PACIFIC

7. Harmful chemical still widely used in fridges, air conditioners

A refrigerant chemical that is harmful to the environment and has ozone depletion potential is still being used in many household and industrial air conditioners and refrigerators in Vietnam. Nguyen Xuan Tien, vice chairman and general secretary of Vietnam Society of Refrigeration and Air-conditioning Engineers, said that in 2010, more than six million household air-conditioners using R22 were installed in Vietnam, consuming about 6,000 tonnes of the chemical.



There was a lack of understanding of the negative impacts of the refrigerant on the environment and a habit of using used/expired equipment in Vietnam, Tien said, adding that R22 was much cheaper than alternatives like R32 or R410A.

In the last few years, air-conditioner/refrigerator producers shifted to products with R32 or R410A, which helped reduce the number of products with R22, Tien said.

However, Vietnam still lacked policies and financial resources to withdraw, transport, and destroy refrigerants, Tien said.

R22 and hydrofluorocarbons (HFCs) are fluorocarbon gas (F-gas) which could damage the ozone layer [sic].

HFCs are widely used as a refrigerant in household and industrial air conditioners, refrigerators, cleaning precision electronic equipment and spray propellants but they have much higher global warming potential than CO₂ and if released, they stay in the atmosphere for decades.

According to a report by the Ministry of Natural Resources and Environment (MONRE), in 2019, HFCs consumption of Vietnam reached 3,772.621 tonnes. In 2020, HFCs consumption topped 6,000 tonnes, mostly R410A, R13a, R404A, R407C and R32.

Meanwhile, Vietnam's HCFC consumption reached nearly 3,600 tonnes in 2019 and more than 2,585 tonnes in 2020.

Due to changes in the environment law, which was revised in November 2020, Vietnam reconfirmed its commitment in joining the global efforts in combating climate change.

Article 92 of the law set important rules and principles for Vietnam to strictly control the consumption of F-gases to ensure the implementation of the Kigali Amendment to the Montreal Protocol, an international treaty on F-gases [sic], which Vietnam has been an active member of since September 2019.

"Vietnam has been taking steps to phase out all ozone-depleting substances and plans to start phasing down F-gases from 2024," said Nguyen Dang Thu Cuc, national ozone coordinator in MONRE's Department of Climate Change.

Roadmaps to manage and phase out ozone-depleting substances and greenhouse gases will be developed and implemented under a Government decree.

The decree is set to clarify the national consumption of ozone-depleting substances to bring it in line with the country's commitments. As a result, a consumption quota would be given to specific industries and sectors.

Cuc said the decree would also facilitate plans for Vietnam to better manage, collect, recycle, reuse, or destroy substances that damage the ozone layer or produce greenhouse gases.

International support

On Wednesday, the Japan International Cooperation Agency (JICA) Vietnam Office and the Department of Climate Change (DCC) under MONRE organised a workshop on 'Exchanging experiences on fluorocarbon gas (F-gas) management'.

The workshop was organised as a part of a 'Survey on promoting the next framework of climate change under the Paris Agreement Rule-book in Vietnam' which JICA has been implementing since July 2020, for Vietnam to exchange experience on F-gas management with countries such as Japan, Australia, Singapore and Malaysia.

At the workshop, speakers from Japan, Australia, Singapore and Malaysia discussed managing F-gases with their Vietnamese counterparts. They agreed that Asian countries need to work together to phase down Hydrofluorocarbons (HFCs), which are common F-gases, to meet the targets set in the Kigali Amendment and contribute to the Paris Agreement., "Together with the Initiative on Fluorocarbons Life Cycle Management of the government of Japan which Vietnam agreed to join in October last year, technical analysis on current management of F-gas in Viet Nam by JICA's Japanese experts will help MONRE in the formulation of specific regulations to control the use and disposal of F-gases," said Murooka Naomichi, Senior Representative of JICA Vietnam Office.

"We also hope our experiences on using appropriate technologies for recovery and destruction of F-gases are useful for Vietnamese companies when the Government implements strict measures for F-gas management," he said.

Tang The Cuong, general of DCC, said Article 92 of the revised Law on Environmental Protection provided major responsibilities and requirements for MONRE as the focal point, as well as actions by ministries and relevant stakeholders in phasing out Ozone Depleting Substances and phasing down HFCs.

"Learning from the experiences of Japan and other countries will help us come up with effective HFC control measures and particularly to stimulate the private sector to convert into more environment-friendly technologies," Cuong said.

[Vietnam Net Global, 29 April 2021](#)

Image: By Do Phuong Anh

WEST ASIA

إعلان هام

شركات قطاع التكييف والتبريد وشركات المواد الرغوية (Foam) ومواد العوازل والمواد الأيروسولية (Aerosols)

استناداً إلى القانون الخليجي رقم (19) لسنة 2015

بشأن المواد المستنفدة لطبقة الأوزون، تمثل دولة قطر طرفاً في اتفاقية فيينا وبروتوكول مونتريال الذي يهدف لحماية طبقة الأوزون، حيث تعمل وزارة البلدية والبيئة ممثلة بإدارة الوقاية من الإشعاع والمواد الكيميائية وإدارة التغير المناخي بالتعاون مع كلية شمال الأطلسي في قطر، على تنفيذ مشروع "المسح الوطني للمواد المستنفدة لطبقة الأوزون وبدائلها في دولة قطر"، وذلك لتحديث البيانات المتعلقة بمواد وأجهزة التبريد والتكييف والإيروسولات والرغويات والعوازل، وعليه، تدعو الوزارة الشركات العاملة في تلك القطاعات، المشاركة في مشروع المسح الوطني للمواد المستنفدة لطبقة الأوزون وبدائلها في دولة قطر، عن طريق إرسال بياناتها الأساسية (اسم الشركة - الشخص المسؤول - رقم الهاتف)، عبر البريد الإلكتروني: (ozone@mme.gov.qa)، وذلك خلال أسبوعين من تاريخ هذا الإعلان، للاستفسار، يرجى التواصل على رقم مركز الاتصال (184)

من إعداد:
وزارة البلدية والبيئة

www.mme.gov.qa

8. Doha Municipality invites companies to participate to the "National Survey of substances that deplete the ozone layer and their alternatives"

البلدية تدعو الشركات للمشاركة بمشروع "المسح الوطني للمواد المستنفدة لطبقة الأوزون وبدائلها"

دعت وزارة البلدية والبيئة شركات قطاع التكييف والتبريد وشركات المواد الرغوية (Foam) ومواد العوازل والمواد الأيروسولية (Aerosols)، للمشاركة في مشروع المسح الوطني للمواد المستنفدة لطبقة الأوزون وبدائلها في دولة قطر، وذلك لتحديث البيانات المتعلقة بمواد وأجهزة التبريد والتكييف والإيروسولات والرغويات والعوازل

وقالت الوزارة في بيان إعلان نشرته على حسابها بموقع تويتر أن ذلك يأتي استناداً إلى القانون الخليجي رقم (19) لسنة 2015 بشأن المواد المستنفدة لطبقة الأوزون، حيث تمثل دولة قطر طرفاً في اتفاقية فيينا وبروتوكول مونتريال الذي يهدف لحماية طبقة الأوزون وأوضحت الوزارة أنها تعمل ممثلة بإدارة الوقاية من الإشعاع والمواد الكيميائية وإدارة التغير المناخي بالتعاون مع كلية شمال الأطلسي في قطر، على تنفيذ مشروع "المسح الوطني للمواد المستنفدة لطبقة الأوزون وبدائلها في دولة قطر"

وأشارت الوزارة إلى أن المشاركة تكون عن طريق إرسال بياناتها الأساسية (اسم الشركة - الشخص المسؤول رقم الهاتف) عبر البريد الإلكتروني (ozone@mme.gov.qa)، وذلك خلال أسبوعين من تاريخ هذا الإعلان.

[الشرق ، 7 أبريل 2021](#)

Image: Alsharq website

NORTH AMERICA

9. 51st Earth Day Welcomes unified recognition of climate solutions

The Global Food Cold Chain Council (GFCCC) Encourages Continued Advancement & Expansion of the Sustainable Global Cold Chain in Support of the Goals of the Paris Climate Agreement and the Montreal Protocol



Washington, DC – APRIL 22, 2021 – The Global Food Cold Change Council heralded the 51st Earth Day and the renewed commitment by the United States to pursue significant actions to reduce greenhouse gas emissions reductions and protect the earth's climate by calling attention to the important role of the food cold chain in these efforts.

Since 2014, the GFCCC has supported US and international climate ambitions by stimulating the discussion for climate-friendly cold chain technologies while reducing refrigerant emissions, minimizing food spoilage, and enhancing energy efficiency in the food cold chain. "In terms of interest and engagement in the sustainable cold chain, years of industry initiative in addressing climate change challenges are being realized," said GFCCC Co-Chair Rajan Rajendran, with Emerson Climate Technologies.

"To that end, the Global Food Cold Chain Council has identified a framework of four pillars to advance the sustainable cold chain agenda, including the development of a data gathering program and model to showcase the benefits of cold chain expansion in developing countries, the development of a technology matrix to identify evolving technological needs and capabilities, support for a funding mechanism focused initially towards capacity building in national governments, and ultimately the development of cold chain expansion projects."

Like much of the international community, the GFCCC reaffirms its commitment to nearer term, impactful action plans and hopes for robust engagement in the upcoming UN Food Systems Summit, the 33rd Meeting of the Parties to the Montreal Protocol and the Climate COP 26 in Fall 2021. The GFCCC remains committed to supporting actions and policies aimed at reducing global HFC emissions by 85 percent by 2050.

The renewed leadership of the US in climate change policies coinciding with Earth Day 2021 reveals an international landscape filled with opportunities for generational climate success.

The Global Food Cold Chain Council (GFCCC): the GFCCC is a coalition of industry technology providers working to encourage expansion of sustainable cold chain in support of the goals under the Montreal Protocol to achieve an environmentally and economically effective phase-down of high-GWP HFC technology, and as a means of also achieving significant reductions in food loss and waste.

Contact: [Kevin Fay The Global Food Cold Chain Council \(GFCCC\)](#)

Image: GFCCC website

10. Moving to net zero may not hurt as much as we think
Ending the carbon habit might affect our lives no more than giving up CFCs did after the 1980s

In 1987, the world signed the Montreal protocol, agreeing to phase out the chlorofluorocarbons and related chemicals depleting the ozone layer. At the time, CFCs were essential components in everyday necessities, such as refrigerants in fridges and propellants of aerosols. But the chemicals are now largely a thing of the past, and the ozone layer is on the mend. The carbon transition is an incomparably larger challenge.



Since the industrial revolution, our societies have been shaped by fossil energy. Our economic geography and even social relations have developed around the extraction, processing, and combustion of hydrocarbons. Emitting CO₂ can seem as inevitable a consequence of economic and social life as breathing. The politics of climate change, too, are harder than the Montreal process, which produced results in record time from the scientific discovery of ozone depletion and with virtually unanimous international support. Even so, global leaders' resolve to shift the world to net zero carbon is strengthening.

US president Joe Biden's climate summit last week brought forth more ambitious national targets, including from the US itself. These targets need to be tighter still, and are only as good as the laws, regulations and tax reforms governments put in place to force economies off their carbon habit. But the direction of travel is unmistakable.

Governments increasingly take the view that economies which fail to take climate action condemn themselves to being technological and business laggards once the transition takes hold. "We are convinced that there is an extraordinary benefit that awaits us," as US climate envoy John Kerry told the Financial Times.

The message is to prepare for a fundamental transformation of our societies and our lifestyles. This is where we can learn from Montreal. Its most striking success is something we never think about: we still have fridges, air conditioners and spray cans.

There is no consumer convenience we had to give up to save the ozone layer. Once CFCs were banned, alternatives were found quickly. Perhaps the cost increased temporarily, but today's products are if anything superior to those of the 1980s. The honest answer to what we had to sacrifice is: nothing. [...]

[The Financial Times, 25 April 2021, By: Martin Sandbu](#)

Image: The FT website

11. The Refrigerant Policy Landscape: A National Framework Comes into Focus

The HVACR industry is sliding toward a unified generation of low-GWP refrigerants

At this time last year, the HVAC industry was in state of upheaval. Half the country's state governors were in the process of implementing the EPA's invalidated SNAP Rules 20 and 21; the American Innovation and Manufacturing (AIM) Act seemed stalled in Congress; and California's Air Resources Board (CARB) was moving ahead with proposed regulations that outpaced the state's building codes. These factors, along with others, were leading to a patchwork of regulations that threatened to derail the U.S. HVAC industry's global leadership. A year later, however, many of those issues are seemingly resolved and the industry is on the



U.S. Air Force Senior Airman Stephanie Holt, 366th Training Squadron, HVAC/R Apprentice course, checks the HVAC system's refrigerant pressure at Sheppard Air Force Base, Texas. (Courtesy of Picryl)

verge of moving toward a unified and safe transition to a new generation of low-GWP refrigerants. [...]

After a year of unprecedented uncertainty—not to mention a pandemic, a smooth U.S. refrigerant transition is finally starting to come into focus. The potential for CARB's GWP limits and implementation dates to align with the EPA's sector-based controls under the AIM Act create an environment in which a de facto nationwide HFC regulatory framework could actually emerge. And with model building codes on track to incorporate updated safety standards by 2024, all of the pieces are falling into place for a safe transition to low-GWP refrigerants.

[The Air Conditioning, Heating and Refrigeration \(ACHR\), 1 May 2021, By: John Sheff](#)

Image: ACHR website (Courtesy of Picryl)

12. Data center cooled using river water

A 7MW data center constructed on a barge at Port of Stockton, California, is being cooled using water from the San Joaquin River. The 10,000ft² (930m²) Nautilus' Stockton data center claims a zero-impact cooling system with high energy efficiency, no water consumption, no refrigerants, no water treatment chemicals, no wastewater, and no harm to wildlife.



The Nautilus Stockton data center is a high-density data center with a cooling system that cuts net power consumption by 30%, supporting 7MW of critical IT load in four vaults.

The center uses Nautilus TRUE (Total Resource Usage Effectiveness) closed water-loop technology using the cold river water to keep racks cool. The system uses no mechanical refrigeration and operates under vacuum, assuring no threat of leaks.

Cool water from the bay is filtered before reaching the heat exchanger. A freshwater cooling loop on the other side of the heat exchanger feeds the cool water to the rear-door systems on the racks.

The IT equipment is housed inside modular data halls on the deck, with servers in racks with rear-door cooling units. Each data hall has four parallel 675kW leak-proof cooling distribution units configured in a "4 to make 3" configuration, each fed by redundant open-loop systems. All the mechanical and electrical equipment are located below the deck in the hold. [...]

[Cooling India, 26 April 2021](#)

Image: Cooling India website

EUROPE & CENTRAL ASIA

13. Belarusian scientists design spectral radiometer for space satellites

MINSK, 26 April (BelTA) – Scientists of the Belarusian State University have designed a unique device for studying Earth's atmosphere from the outer space. The three-band spectral radiometer MSR-09 is designed to be mounted on nano satellites in order to study the content of trace gases in Earth's troposphere by measuring solar radiation absorbance spectrum, the university's press service told BelTA.



The spectrometer uses three sensors that focus on different optical bands. They register diffuse solar radiation that passes through layers of the atmosphere in the vertical direction and the horizontal one. The vertical scheme of solar radiation input allows studying the quantity of gases and aerosols while the horizontal one examines their distribution in the atmosphere. The collected data is stored in a microcontroller and beamed down to Earth's surface for further processing.

The innovative R&D product will enhance the ability of meteorological forecasters and ecologists to study Earth's atmosphere in detail. It will allow evaluating the speed of the ozone layer's recovery, finding sources and ways of transfer of gases and aerosols, which pollute the ground air and affect the temperature climate in several parts of the planet. The spectral radiometer has already been successfully tested by the electronics manufacturer OAO Peleng in conditions closely resembling the outer space.

The technology has no world analogs and has been patented in Belarus.

The spectral radiometer was designed by a team of scientists of the A. N. Sevchenko Institute of Applied Physical Problems of the Belarusian State University led by Head of the Aerospace Research Department, Professor Boris Belyayev.

[Belarusian Telegraph Agency \(BelTA\), 26 April 2021](#)

Image: BelTA website

FEATURED



OZONE SECRETARIAT

[Overview for the meetings of the ozone treaties in 2021](#)

- [11th ORM](#), Geneva, Switzerland | 14 - 16 April 2021
- [66th IMPCOM](#), Bangkok, Thailand | 12 July 2021
- [43rd OEWG](#), Bangkok, Thailand | 12 - 16 July 2021
- [67th IMPCOM](#), Nairobi, Kenya (tentative) | 23 October 2021
- [12th COP – 32nd MOP Bureau](#), Nairobi, Kenya (tentative) | 24 October 2021
- [12th COP \(part II\) – 33rd MOP](#), Nairobi, Kenya (tentative) | 25 - 29 October 2021

Click [here](#) for past and upcoming Montreal Protocol Meetings Dates and Venue.

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. [Learn more >>>](#)



[THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL](#)

- Click [here](#) for the Executive Committee upcoming and past Meetings and related documents..
- [Executive Committee Primer – 2020](#) - An introduction to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol.



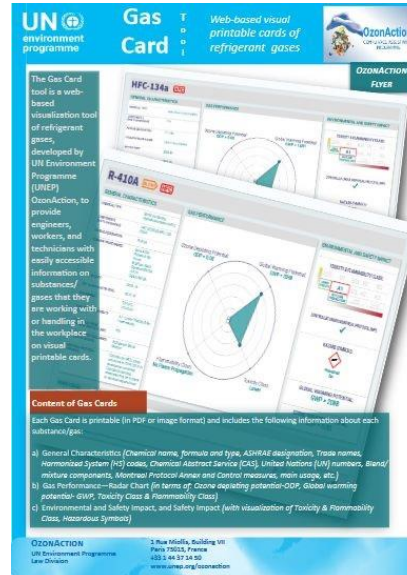
OzonAction

[OzonAction Compliance Assistance Programme](#) produces and outreaches a wide variety of information and capacity building materials and tools that support the implementation of the Montreal Protocol programs and assist Article-5 countries in meeting the compliance targets. These include publications, technology briefs and factsheets, mobile applications, videos, e-Learning, modelling and database programs and special educational or certification programs.

**The section below features several of our most recent products.
Visit [OzonAction website](#) for more information, discover the entire range of products.**

Images in this section are by OzonAction

Gas Card Tool: Web-based Visual Printable Cards of Refrigerant Gases developed by the UN Environment Programme (UNEP) OzonAction, to provide engineers, workers, and technicians with easily accessible information on substances/ gases that they are working with or handling in the workplace on visual printable cards. **Content of Gas Cards** - Each Gas Card is printable (in PDF or image format) and includes the following information about each substance/gas: a) General Characteristics (Chemical name, formula and type, ASHRAE designation, Trade names, Harmonized System (HS) codes, Chemical Abstract Service (CAS), United Nations (UN) numbers, Blend/ mixture components, Montreal Protocol Annex and Control measures, main usage, etc.) b) Gas Performance— Radar Chart (in terms of: Ozone depleting potential-ODP, Global warming potential- GWP, Toxicity Class & Flammability Class) c) Environmental and Safety Impact, and Safety Impact (with visualization of Toxicity & Flammability Class, Hazardous Symbols).



More Information - The Gas Card web based tool is part of UNEP OzonAction's portfolio of activities and tools to assist various stakeholders in developing countries, including customs officers and technicians, to achieve and maintain compliance with the Montreal Protocol on Substances that Deplete the Ozone Layer. In the left navigation bar of the Gas Card tool web page, you will find a list of commonly used HFCs and HFC Blends in different sectors.*

Using the Gas Card web-based tool

- The Gas Card tool is available online on the [OzonAction website](#)
- Read the full [2021 annual iPIC report](#)
- See the [flyer](#) introducing the new iPIC platform

* Based on the Overall Analysis of the Results of the Survey of ODS Alternatives Report (conducted in 119 countries from 2012 to 2015)



[HCFC Quota and Licence Tracker](#) - UNEP OzonAction launches a new desktop application to assist with HCFC licences and quotas - National Ozone Officers have the great responsibility of managing the allocation and monitoring of quotas for substances controlled under the Montreal

Protocol. This process can be complex with many importers, especially if the country imports a range of different hydrochlorofluorocarbons (HCFCs) and mixtures containing HCFCs. To address this challenge, OzonAction developed a new desktop application that helps Ozone Officers with the tasks of planning, calculating, monitoring and managing consumption quotas and licences. It can be used on a daily basis to track and manage the current year's quota allocations for different importers, or for future planning by trying different scenarios that adjust the type of substances imported, their quantity, or the number of importers. The HCFC Quota and Licence Tracker allows Ozone Officers to see the effect of such scenarios on the national HCFC consumption and helps ensure that the quotas stay within agreed HCFC Phase-out Management Plan (HPMP) targets. For countries that have ratified the Kigali Amendment, in the future OzonAction will extend the tracker to include hydrofluorocarbons (HFCs) once countries begin designing their quota systems for those controlled substances.

Access the:

- [HCFC Quota tracker app](#)
- [Flyer for more information on the tracker](#)
- [Short video tutorial on the OzonAction YouTube Channel](#)

[GWP-ODP Calculator Application](#) - Updated

“Quickly, efficiently and accurately convert between values in metric tonnes, ODP tonnes and CO₂-equivalent tonnes”

Data are extremely important for the Montreal Protocol community, and the data reporting formats for both A7 and CP have changed recently, to a large degree triggered by the Kigali Amendment. HFCs, blends, CO₂-equivalent values, etc, now have to be addressed much more frequently by Ozone Officers during their daily work. Sometimes the terminology and values are complex and can be confusing, and it helps to have it all the official facts and figures in one place. Conversion formulas need to be applied to calculate CO₂-eq values from both GWP and metric tonne values. This free app from OzonAction is a practical tool for Ozone Officers to help demystify some of this process and put frequently-needed information at their fingertips.



What's new in the app:

- An updated more user-friendly interface
- Multilingual interface: English, French and Spanish
- A new **Kigali Amendment mode** - in this mode the GWP values used to calculate the refrigerant blends/mixtures only include GWP contributions from components that are controlled HFCs
- Latest updated ODP and GWP values from the recent reports from the Montreal Protocol technology and scientific expert panels as well as the Intergovernmental Panel on Climate Change (IPCC) reports
- References added for sources of all values
- New refrigerant mixtures (with ASHRAE -approved refrigerant designations)

The new and updated UNEP OzonAction **GWP-ODP Calculator** application will help you to convert between values in metric tonnes, ozone depleting potential (ODP) tonnes and CO₂-equivalent tonnes of substances controlled by the Montreal Protocol and their alternatives.

This application, available at no cost, is particularly useful for National Ozone Officers to assist with understanding and calculating quantities of controlled substances, both pure substances and mixtures, for quota assignment, reporting requirements, etc. Other stakeholders interested in ODP and global warming potential (GWP) values of controlled substances and their alternatives will also find this tool useful.

Operation of the application is very simple – just select a substance from the dropdown list and enter the known value in the appropriate field; the calculator will automatically perform the conversion between metric tonnes, ODP tonnes and/or CO₂-equivalent tonnes and display the corresponding converted values. The ODP, GWP and information about the substance is provided. For mixtures, the components of the mixture and their relative proportions (metric, ODP, CO₂- equivalent tonnes) are also calculated.

The updated **GWP-ODP Calculator** application now includes a new Kigali Amendment mode. The app can now be used in two different modes: the regular "Actual Values" mode and the "Kigali Amendment" mode. In the Kigali Amendment mode, the GWP values provided are those specified in the Kigali Amendment to the Montreal Protocol, i.e. GWP values are only assigned to controlled HFCs. In this mode the GWP values used to calculate the refrigerant blends/mixtures only include GWP contributions from components that are controlled HFCs. The user can effortlessly switch between modes.

The OzonAction GWP-ODP Calculator uses standard ODP values and GWP values as specified in the text of the Montreal Protocol to make the conversions. Other ODP and GWP values from the recent reports of the Montreal Protocol Technology and Economic Assessment Panel and Scientific Assessment Panel as well as the Intergovernmental Panel on Climate Change (IPCC) are used when appropriate, with references to sources of all values used. The app includes new refrigerant mixtures (with ASHRAE- approved refrigerant designations).

This application is designed primarily for use by Montreal Protocol National Ozone Units and other related stakeholders. The application was produced by UN Environment Programme (UNEP) OzonAction as a tool principally for developing countries to assist them in meeting their reporting and other commitments under the Protocol and is part of the OzonAction work programme under the Multilateral Fund for the Implementation of the Montreal Protocol.

If you already have the application installed on your device, be sure to update to benefit from the new features. The app can be viewed in English, French or Spanish.



Smartphone Application: Just search for “GWP-ODP Calculator” or UNEP in the Google Play store or use the QR code – free to download! If you already have the application installed on your device, be sure to update to benefit from the new features.



Desktop Application: *GWP-ODP Calculator* is also available online on the OzonAction [website](#)



Watch the new short introductory tutorial **video** on the *GWP-ODP Calculator* - available now on [YouTube](#)

>>> Read/download the [flyer](#) for more information

OzonAction [WhatGas?](#) Updated

New features:

- An updated more user-friendly interface
- Multilingual interface: English, French and Spanish
- HFCs and HFC containing mixtures
- Latest updated ozone depleting potential and global warming potential values from the recent reports from the Montreal Protocol technology and scientific expert panels as well as the Intergovernmental Panel on Climate Change; as well as the standard ODP and GWP values as specified in the text of the Montreal Protocol
- References to sources of all values used
- New refrigerant mixtures (with ASHRAE approved refrigerant designations)
- Values for ‘actual GWP’ and ‘Kigali Amendment context’ GWP for pure substances and mixtures (i.e. only including GWP values/components assigned to controlled hydrofluorocarbons - HFCs).



The WhatGas? application is an information and identification tool for refrigerant gases: ozone depleting substances (ODS), HFCs and other alternatives. It is intended to provide a number of stakeholders, including Montreal Protocol National Ozone Officers, customs officers, and refrigeration and air-conditioning technicians with a modern, easy-to-use tool

that can be accessed via mobile devices or the OzonAction website to facilitate work in the field, when dealing with or inspecting ODS and alternatives, and as a useful reference tool. If the user requires additional information or assistance in identifying a refrigerant gas they are inspecting or that is described in the relevant paperwork, this can be easily obtained by consulting the application.

Using the application:

If you already have the application installed on your device, be sure to update to benefit from the new features.

Smartphone Application: Just search for “WhatGas?” or UNEP in the Google Play store or use the QR code – free to download!



Desktop Application: WhatGas? is also available online on the [OzonAction website](#)

For more information: Watch the new short introductory tutorial [video](#) on WhatGas? available on [YouTube](#)

See/download the [WhatGas? flyer](#)

Over 10,000 installations on Android and iOS devices to date!

[RAC Technician Videos](#) - Full length films!

Two 'full length' videos for refrigeration and air-conditioning (RAC) sector servicing technicians: on 1) Techniques, Safety and Best Practice and 2) Flammable Refrigerant Safety.




The OzonAction Refrigeration and Air-Conditioning Technician Video Series consists of instructional videos on techniques, security and best practice and flammable refrigerant safety. They are intended to serve as a complementary training tool RAC sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training. The videos are not intended to replace structured formal technician training, but to supplement and provide some revision of tips and skills and to build on training already undertaken.

These videos are based on the successful UNEP OzonAction smartphone application, the RAC Technician Video Series app. This application has been downloaded on more than **86,000** devices since its launch.


Following many requests to make the videos more versatile and better suited to classroom and training settings, OzonAction has responded to this demand and produced two 'full-length' instructional videos.

You may wish to share this message and the flyer with:

- Your national/regional RAC associations
- Training or vocational institutes
- Master RAC trainers in your country
- Any other interested national stakeholders

 You can watch these videos on the OzonAction YouTube Channel:

- [Techniques, Safety and Best Practice](#)
- [Flammable Refrigerant Safety](#)

 The videos are also available for download by request from UNEP OzonAction: unep-ozonaction@un.org



If you prefer to access the video clips via the OzonAction smartphone application, just search for "RAC Technician Video Series" or UNEP in the Google Play Store and iTunes/App Store or scan the QR code

Free to download!

The flyer is available from the [OzonAction website](#).

[Refrigerant Cylinder Colours: What has Changed](#)

A new UNEP OzonAction factsheet on the new AHRI revised guideline on a major change to refrigerant cylinder colours

One of the ways in which refrigeration cylinders are quickly identified is by cylinder colour. Although there was never a truly globally-adopted international standard, the guideline from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) although not required by law was used by the vast majority of industry and chemical producers around the world.

An AHRI revised guideline, first published in 2015, now removes paint colour assignments for refrigerant containers and specifies that all refrigerant containers should have the same paint colour from 2020 onwards.

NOOs and technicians should be aware of this change and inform national stakeholders, as well as familiarising themselves with relevant container labels and markings for refrigerants.

Read/download the [factsheet](#)



[Update on new refrigerants designations and safety classifications](#)

The latest version of the factsheet providing up to date information on refrigerant designations and safety classifications is now available (September 2020 update).

The factsheet, produced by [ASHRAE](#) in cooperation with [UN Environment Programme OzonAction](#) is updated every 6 months.

The purpose is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an "R" number (or ASHRAE designation) over the last few years and which have been introduced into the international market.

Read/download the [factsheet](#)

The factsheet, as well as more information on ASHRAE-UNEP joint activities and tools, is also available on the [ASHRAE UNEP Portal](#).

Contact: [Ayman Eltalouny](#), OzonAction, UN Environment Programme



[OzonAction's iPIC platform - Updated](#)

Collaboration between China and Thailand using OzonAction's informal Prior Informed Consent (iPIC) system has resulted in the prevention of a huge consignment of ozone-depleting and climate damaging hydrochlorofluoro-carbons (HCFCs).

Those chemicals, which are primarily used as refrigerants for air conditioners and fridges, are controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer and are being phased out by all countries according to a specific timeline.

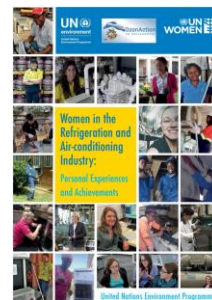


[Women in the refrigeration and air-conditioning industry: Personal experiences and achievements](#)

The United Nations Environment Programme's (UNEP), OzonAction, in cooperation with UN Women, has compiled this booklet to raise awareness of the opportunities available to women and to highlight the particular experiences and examples of women working in the sector and to recognise their successes.

All of the professionals presented in the booklet are pioneers. They are role models whose stories should inspire a new generation of young women to enter the weld and follow in their footsteps.

Read/download the [publication](#)



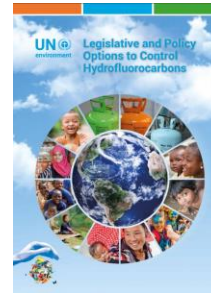
PUBLICATIONS

[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.

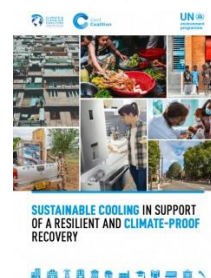
[Read/download](#)



Latest issue of Centro Studi Galileo magazine, **Industria & Formazione**, [n. 3 - 2021](#) (in Italian).



[Sustainable Cooling in support of a Resilient and Climate Proof Recovery](#), Report by the Climate and Clean Air Coalition (CCAC), 2021.



[Solar Cooling \(2020\), 40th Informatory Note on Refrigeration Technologies. Summary](#)

- Solar cooling is a promising and environmentally friendly technology that can help meet the growing global demand for space cooling. Solar cooling can be achieved by various technologies. The two main commercial options are photovoltaic (PV)-driven vapour compression chillers and heat-driven cooling machines powered by solar collectors. Thermal cooling equipment can be coupled with various types of solar collectors with different efficiencies and costs. Overall system efficiencies of PV-driven and solar thermal-driven plants may not have such different values. Economic analysis indicates that the investment cost for the PV solution is at least half that of other systems. Solar cooling may have a very positive environmental impact by reducing the use of fossil fuels, and the technology may be considered mature to compete with conventional cooling equipment.



** This Informatory Note is an update of a previous version published in April 2017. It was prepared by Renato Lazzarin (President of IIR Section E).*

A Summary for policy makers - Solar Cooling 2020 is [available](#) in English and French languages.

[International Institute of Refrigeration, March 2021](#)

[Leaks, maintenance and emissions: Refrigeration and air conditioning equipment report](#)

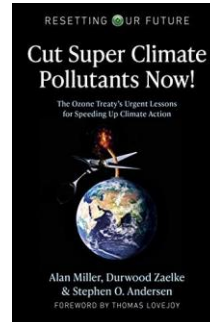
details common faults identified in both residential and commercial refrigeration and air conditioning equipment. The report also lists the impacts of these faults and how routine maintenance of the equipment has the potential to significantly reduce electricity use, refrigerant leaks and emissions.

The research was supported by an extensive survey of international and domestic literature included as Appendix B to the report.



[Australian Government, Department of Agriculture, Water and the Environment, Expert Group, 2021](#)

Cut Super Climate Pollutants Now!: The Ozone Treaty's Urgent Lessons for Speeding Up Climate Action (Resetting Our Future). We have a decade or less to radically slow global warming before we risk hitting irreversible tipping points that will lock in catastrophic climate change. The good news is that we know how to slow global warming enough to avert disaster. Cut Super Climate Pollutants Now! explains how a 10-year sprint to cut short-lived "super climate pollutants" – primarily HFC refrigerants, black carbon (soot), and methane – can cut the rate of global warming in half, so we can stay in the race to net zero climate emissions by 2050.



Authors: Alan Miller, Durwood Zaelke, Stephen O. Andersen.

MISCELLANEOUS



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

The United Nations Environment Programme, 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 Programme, OzonAction

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



Click [here](#) to access recent OzoNews Issues [Request a PDF](#) of the current issue

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Prepared by: Samira Korban-de Gobert

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