

OzoNews

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

Volume XXIV | 15 August 2024

In this issue:

- 1. Kigali Amendment latest ratifications**
- 2. World Ozone Day 2024 - Montreal Protocol: Advancing Climate Action**
- 3. Opportunities for Alternative Cooling Technologies in the HFC Transition**
- 4. UNEP OzonAction supports women in cooling at Chillventa**
- 5. Future Trends of Natural Refrigerants: Selection, Preparation, and Evaluation**
- 6. New Standard for Uganda's cooling sector**
- 7. China Policy Developments Provide Opportunities to Tackle Lifecycle Refrigerant Management in the Cooling Equipment End-of-Life Recycling and Disposal Processes**
- 8. Indonesia Sets Path for Climate-Friendly Cooling with National Cooling Action Plan**
- 9. Cambodia's construction sector all-in on passive cooling strategy**
- 10. Educating on Ozone Layer Protection and Mitigation of Climate Change**
- 11. Chile como modelo para la regeneración de gases refrigerantes en República Dominicana**
- 12. Workshop to exchange experiences between Egypt and Iraq**
- 13. Natural Refrigerant Technology Options for Food Retail – Webinar**
- 14. Chloromethanes in the North American Troposphere and Lower Stratosphere Over the Past Two Decades**
- 15. National Ozone Units - Cool Training in Germany**
- 16. Italian customs seize over 40 tonnes of illegal refrigerant**

GLOBAL

1. Kigali Amendment latest ratifications

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

Bahrain, 1 July 2024

United Arab Emirates, 19 April 2024

Thailand, 3 April 2024

Djibouti, 8 March 2024

Guatemala, 11 January 2024



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

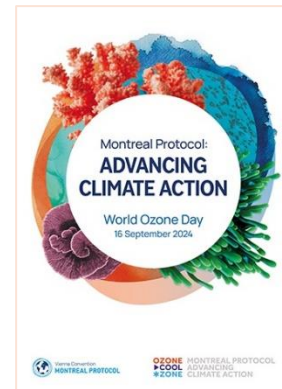
2. World Ozone Day 2024 - Montreal Protocol: Advancing Climate Action

The Montreal Protocol is rightly hailed as a multilateralism success story. It united the world to phase out ozone-depleting substances putting the ozone layer on the path to recovery and protecting all life on Earth. On this World Ozone Day, we also celebrate its climate action.

Phasing out ozone-depleting substances has proven to be a powerful tool for climate action that has helped slow global warming, for example, postponing the first ice-free Arctic summer by up to 15 years.

Through the Kigali Amendment, climate action is being further accelerated. Countries commit to phase down the production and consumption of hydrofluorocarbons (HFCs) – powerful climate-warming gases that replaced ozone-depleting substances in the various sectors. If the Amendment is fully ratified and implemented, up to 0.5°C of warming could be avoided by 2100.

Cooling equipment represents 20 per cent of total electricity consumption today and is expected to more than double by 2050. Kigali Amendment implementation alongside a switch to energy efficient cooling equipment could potentially double these gains!



Work has already begun to deliver on these climate action gains. Nearly 80 per cent of Parties have ratified the Kigali Amendment, including the US, China and India – all major producers or consumers of HFCs. Developed countries began phasing down HFCs in 2019 with many developing countries starting this year.

So, on this World Ozone Day, we not only celebrate the achievements to date but also look to the future for deeper and faster action under the Montreal Protocol. Deeper and faster for the ozone layer but above all, for people, for climate and for the planet.

UNEP Ozone Secretariat, World Ozone Day 2024

Image: UNEP Ozone Secretariat

World Ozone Day 2024 "Montreal Protocol: Advancing Climate Action"

> Theme in Arabic | Chinese | English | French | Russian | Spanish

> Graphic visualisation: Posters for printing: Arabic | Chinese | English | French | Russian | Spanish

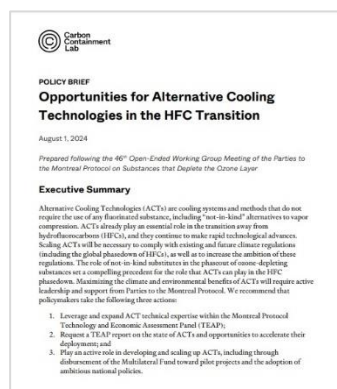
3. Opportunities for Alternative Cooling Technologies in the HFC Transition

Introduction

This year, the hydrofluorocarbon (HFC) transition mandated by the 2016 Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer ("the Protocol") entered a critical phase marked by production and consumption freezes for Article 5 Group 1 Parties and the beginning of baseline-setting for Group 2 Parties.¹ Despite the added challenges posed by the COVID-19 pandemic, parties to the Protocol are on track for global compliance – an encouraging sign for international governance and Earth's atmosphere. The phasedown of HFCs mandated by the Kigali Amendment, if accomplished, will avoid up to 0.5°C of projected warming by 2100.²

This success, however, is not yet guaranteed. The market transformation under the Kigali Amendment will require that the Protocol aggressively pursue a broad portfolio of substitutes for HFC-based applications, including air conditioning and refrigeration, insulating foams, solvents, and fire suppressants. These substitutes range from superefficient hydrocarbons and low-Global Warming Potential (GWP) fluorinated substances to novel and innovative approaches. The HFC phasedown can move at the speed replacements become available and feasible, and there is no single replacement for every application. The more different types of substitutes are available, the faster and more efficient the transition will be.

This policy brief, compiling key takeaways from a Side Event at the Protocol's 46th Open-Ended Working Group Meeting, argues for the more ambitious deployment of one class of innovative replacements: Alternative Cooling Technologies (ACTs), a subset of not-in-kind substitutes



that encompasses cooling methods not requiring the use of any fluorinated substances ("F-Gases"). ACTs can both aid compliance and acceleration of the phasedown – an urgently needed goal as other international efforts to control and reduce emissions of greenhouse gases fail to move at the pace required to stay below 1.5°C warming.³ ACTs can enhance the overall climate mitigation of the HFC transition, such as in cases where existing low-GWP substitutes continue to face barriers to deployment, particularly in the near term. ACTs also may enable further improvements in equipment energy efficiency and eliminate the potential for leaks of refrigerant gases from equipment. ACTs are not exclusive of existing substitute refrigerants, but they clearly have a role to play in accelerating and sustaining the HFC transition to climate-friendly refrigerant technologies.

New technological breakthroughs, policies, and market incentives all have a role to play in scaling ACTs and maximizing the climate benefits of the Kigali Amendment. Below, we situate ACTs within the context of the broader HFC transition, examine how prior examples from the ODS phase out can inform ACT deployment, and present steps that the Parties can take to facilitate their development.

1 United Nations Environment Programme, "Frequently asked questions relating to the Kigali Amendment to the Montreal Protocol" (2017). https://ozone.unep.org/sites/default/files/2020-01/FAQs_Kigali_Amendment.pdf

2 Guus J. Velders, et al., The large contribution of projected HFC emissions to future climate forcing, 106 Proceedings of the National Academy of Sciences 10949 (2009).

3 United Nations Framework Convention on Climate Change, Global Stocktake, November 2023. <https://unfccc.int/topics/global-stocktake>

The Carbon Containment Lab (CC Lab), 1 August 2024

Image: CCLab

4. UNEP OzonAction supports women in cooling at Chillventa

UNEP OzonAction is joining other international organizations to promote opportunities for women in the refrigeration, air conditioning, and heat pump (RACHP) sector at the INWIC stand in Hall 9 at Chillventa.



INWIC, the International Network for Women in Cooling, will be one of the 900-plus exhibitors represented at Chillventa, the biennial trade fair in Nuremberg, Germany, that takes place this year from 8 to 10 October. UNEP OzonAction is one of the INWIC founding partners.

INWIC Board members will meet with visitors and other exhibitors to describe INWIC's mentorship initiative which helps women become aware of opportunities in the field and supports their advancement in leadership positions. A focus of INWIC is to attract a new generation of specialists by communicating how RACHP provides comfort and supports life-saving technologies while new technologies safeguard the environment. INWIC also promotes best practices which help practitioners deliver essential cooling services while securing the environment.

Visitors to Chillventa are encouraged to visit INWIC at Stand 9-125 in Hall 9 to learn more about how they can join INWIC and how they can support INWIC events.

In addition to the exhibits, Chillventa offers a wide-ranging supporting program presenting findings of research on new techniques and applications of successful adoption of new technologies. Attendees come from around the world to meet with experts in the sector. Exhibitors will present their latest products and solutions to engineers, technicians, and end users, covering topics like applications, training, and codes of practice. The forum A PRACTICAL GUIDE TO DIGITISATION will provide advice for skilled trade businesses. In line with INWIC's objectives, the fair will also present "reverse recruiting," an innovative approach where companies at Chillventa can advertise their vacancies for skilled personnel.

- >>> Learn more about [Chillventa](#) and register to attend.
- >>> Learn more about [INWIC](#) activities and how it is inspiring women worldwide to become engaged in RAC.

UNEP-OzonAction, 13 August 2024

Image: Chillventa 2024

5. Future Trends of Natural Refrigerants: Selection, Preparation, and Evaluation

Abstract

The field of refrigeration technology has played a pivotal role in modern society, providing essential cooling solutions for various industries, including food preservation, healthcare, and manufacturing.

However, the conventional refrigerants used in these systems, such as hydrofluorocarbons (HFCs) and chlorofluorocarbons (CFCs), have been identified as major contributors to climate change and ozone depletion. Recently, the heightened environmental consciousness of the refrigeration industry paved the way for searching for natural refrigerants (NRs) as an alternative to the usual commercial and synthetic refrigerant (SR). Natural refrigerants are known to be substances that occur naturally in the Earth's surroundings and were commonly used, while synthetic refrigerants took their place because of their known better thermal performance durability and safety.

Despite challenges such as flammability and toxicity, these NR substitutes demonstrate competitive performance, urging a transition from traditional SR. In this review paper, commonly known NRs such as ammonia, carbon dioxide, air, and hydrocarbons, are presented in terms of their sustainable characteristics, historical origins, selection criteria, preparation techniques, evaluations, and impacts.



To provide a sustainable and eco-friendly guideline for the advancement of refrigeration technology, this analysis examines the trends, selection criteria, preparation processes, and evaluation procedures of different NRs.

Finally, the results presented in this paper will be useful baseline information for both researchers and scientists in developing a refrigeration system.

Authors: Sheila Mae R. Bantillo, Gen Aaron C. Callejo, Samantha Mariya Kaila G. Camacho, Mark Anthony Montalban, Raven E. Valderin, and Rugi Vicente C. Rubi

MDPI Engineering Proceedings, Volume 67, Issue 1, 8 August 2024

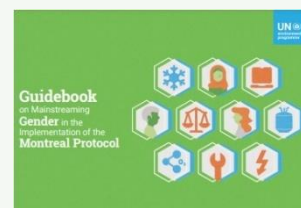
Image: Engineering Proceedings

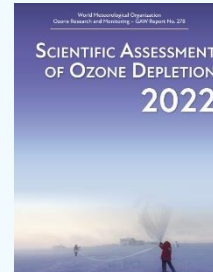
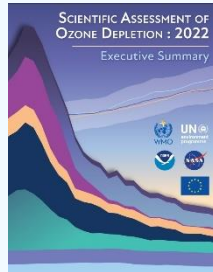
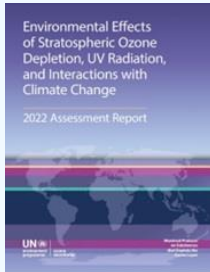
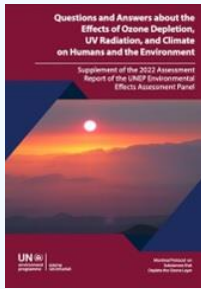
See also >>> [Rethinking time-lagged emissions and abatement potential of fluorocarbons in the post-Kigali Amendment era](#), Nature Communications, volume 15, Article number: 6687, 6 August 2024

Upcoming 2024 World Cold Chain Symposium (WCCS) - Less food waste. Reduced greenhouse gas emissions. Greater food security. This is the path to addressing hunger and a better future. It takes a more sustainable cold chain to get us there. The WCCS is a global conference organized by The Global Food Cold Chain Council (GFCCC) in partnership with the United Nations Environment Programme (UNEP) and sponsored by Carrier. **The 2024 World Cold Chain Symposium, Bangkok, Thailand, on Saturday, 26 October 2024. Register now** to join the Global Food Cold Chain Council and experts worldwide, as we come together for an in-person, complimentary event focused on the benefits of building efficient and sustainable business models for the development of the cold chain around the globe.

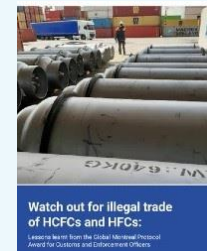


Guidebook on Mainstreaming Gender in the Implementation of the Montreal Protocol - OzonAction, in consultation with UN Women and a gender expert, has developed this **Guidebook on Mainstreaming Gender in the Implementation of the Montreal Protocol** to advance the agenda of gender equality and women's empowerment through the implementation of Montreal Protocol activities. The Guidebook is designed to assist National Ozone Officers with addressing gender issues through their daily work and operations. **Read/download [English](#) | [Russian](#)**





Watch out for Illegal Trade of HCFCs and HFCs: Lessons learnt from the Global Montreal Protocol Award for Customs and Enforcement Officers. This publication provides an analysis of the cases submitted in the context of the **Global Montreal Protocol Award for Customs and Enforcement Officers**. The Global Award was launched in 2018 by UNEP OzonAction. This Global Award is intended to raise awareness about the Montreal Protocol and to recognise customs and enforcement officials for their efforts in preventing and combating illicit traffic in Montreal Protocol and Kigali Amendment-regulated substances. Ozone-depleting substances (ODS) include hydrochlorofluorocarbons (HCFCs) and other compounds with a high Global Warming Potential (GWP), particularly hydrofluorocarbons (HFCs).



UNEP OzonAction, ASHRAE, April 2023 Fact sheet: Update on New Refrigerants Designations and Safety Classifications. The purpose of this fact sheet is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an «R» number over the last few years and introduced into the international market.



Sustainable cold chains: Virtual Exhibition - The virtual exhibition for sustainable cold chains aims to highlight the critical role of cold chains in ensuring food safety and security, access to vaccines, reducing global warming and preventing ozone layer depletion. The exhibition showcases commercially available cold chain technologies for food and vaccines, mainly targeting applications and equipment with refrigeration and cooling cycles that use ozone and climate-friendly refrigerants and have enhanced energy efficiency characteristics. It also aims to promote game-changing and systemic approaches, relevant initiatives, and not-in-kind solutions to cold chains

These technologies and approaches directly contribute to meeting national obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer including its Kigali Amendment and the Paris Agreement on Climate Change. Sustainable cold chain contributes to the achievement of many **Sustainable Development Goals**.

The exhibition is ongoing and continuously updated with submissions accepted on a rolling basis. The partners of the exhibition will continue promoting the exhibition at all relevant events and throughout 2022 and beyond.

Click [here](#) for more information / submit a nomination >>>

Image: Sustainable cold chains website



Categories



1 exhibits
On site post-harvesting and/or precooling applications



6 exhibits
Storage of product, e.g., large warehouses / Distribution centers



6 exhibits
Storage on board ships, aircraft, and containers



4 exhibits
Food processing plants



1 exhibits
Transport (large and smaller trucks, smaller containers)



6 exhibits
Supermarkets (wholesale markets & Retailers)



1 exhibits
Food services (Restaurants, cafes, tourism facilities, etc)



2 exhibits
Vaccines and other pharmaceutical products



6 exhibits
Game-changing and systemic approaches

Vanuatu's Case Study on Integrating ODS/HFC Module into the National Single Window System - The National Single Window is a centralized system that links all relevant government approving authorities and acts as a 'one-stop-shop' where importers and exporters may submit applications electronically including information and all required paperwork to support the application and approval process. **Read/Download the [Factsheet](#) >>>**



Recognition of Prior Learning Scheme for Refrigeration and Air-Conditioning Servicing Technicians in Mongolia - The Recognition of Prior Learning (RPL) process can help those in the industry acquire a formal qualification that matches their knowledge and skills and thereby contributes to improving their employability, mobility, and lifelong learning. RPL can make a significant contribution to providing the relevant learning framework necessary for the present and ongoing maintenance of a quality workforce, especially in the RAC servicing sector. In Mongolia, the RPL process has been rolled out in over 30 TVET trades in the construction, mining, and other sectors, including apparel and culinary etc. Mongolia initiated the RPL scheme for RAC servicing technicians as part of their implementation of the HPMP in cooperation with various national stakeholders. **Read/Download the [Factsheet >>>](#)**



AFRICA

6. New Standard for Uganda's cooling sector

In a consultative stakeholder's workshop new quality and safety standards for Uganda's cooling sector were discussed. The results will help to save energy and reduce the environmental impact.



In July 2024, new quality and safety standards in the refrigeration and Air Conditioning (RAC) sector for Uganda were discussed in a consultative stakeholder's workshop. The event was organized by the Uganda National Bureau of Standards (UNBS), Uganda National Renewable Energy and Energy Efficiency Alliance (UNREEA), Uganda National Association of Refrigeration and Air Conditioning (UNARA) and GIZ. The discussion focused on standards for household electrical appliances, refrigeration, and heat pumps, as drafted by UNBS/TC 107 mechanical engineering and UNBS/TC 116, electrical appliances.

Energy efficiency and Greenhouse Gas Emissions

In his opening remarks, Anthony Orit, GIZ Advisor on the Green Cooling Initiative Project, highlighted the critical importance of this workshop: "Given the urgent threat of global warming, the RAC sector is vital in controlling greenhouse gas (GHG) emissions. By 2030, the RAC sector is expected to account for 13% of global GHG emissions due to increased use of hydrofluorocarbons (HFCs) and escalating energy consumption. This underscores the necessity for a swift transition to climate-friendly and energy-efficient RAC technologies, especially here in Uganda."

Energy efficient appliances such as Propane (R290) refrigerators and split Acs, are a sustainable solution for cooling. R290 has favorable thermodynamic properties, that enable

high energy efficiency, furthermore, it possesses ultra-low global warming potential and has zero impact on the ozone layer. Using natural refrigerants, therefore, is not only lowering the direct emission through less leakages, but also indirectly through a lower energy consumption during the products lifecycle. Hence, the emphasis of good quality energy efficient natural refrigerant appliances with a certain minimum energy performance can have a huge positive impact on the environment.

Safety Standards

UNBS is a statutory body under the Ministry of Trade, Industry and Co-operatives set up to develop, promote and manage Standards in Uganda for protection of consumers and enhancement of competitiveness of exports in regional and international markets. Cooling appliances can be found everywhere; therefore, standards are required to guide the stakeholders on safe handling of these equipment and to ensure appropriate quality.

“Refrigeration and air conditioning appliances are very important components in buildings and are widely used in hotels, hospitals, manufacturing companies, banks, and supermarkets among others. To regulate the quality of these products it is necessary to have in place very suitable Standards.”, said Mr. Andrew Othieno – Manager Standards Development at UNBS.

Green cooling initiative, 6 August 2024

Image: Green cooling initiative

ASIA AND THE PACIFIC

7. China Policy Developments Provide Opportunities to Tackle Lifecycle Refrigerant Management in the Cooling Equipment End-of-Life Recycling and Disposal Processes



24 July 2024 – From January through July 2024, China agreed to various targets and measures to support the mitigation of fluorinated gas, including hydrofluorocarbon (HFC) and hydrochlorofluorocarbon (HCFC) refrigerant recycling and recovery, including:

Prohibition of direct emissions of refrigerants and requires recycling, reuse, and harmless disposal of these substances during servicing and end-of-life processes: These prohibitions are included in the recently amended [Regulation on the Administration of Ozone Depleting Substances](#) (effective as of 1 March 2024, IGSD translation, [here](#)).

- Implementation of these prohibitions faces challenges. According to official [data](#) from China’s Ministry of Ecology and Environment, only around 40% of waste TV sets, refrigerators, washing machines, air conditioners (ACs), and microcomputers were properly recycled and disposed of from 2012 to 2020. For the

AC sector, Chinese researchers **found** that the total refrigerant emissions from ACs were 85 Mt CO₂-eq in China in 2019; 79% of these refrigerant emissions arose from AC disposal.

Lifecycle refrigerant management in end-of-life recycling and disposal processes for cooling equipment:

- On 23 January 2024, the China Ministry of Commerce, together with eight other national ministries and agencies, issued **policy guidelines** to promote the recycling of household appliances with the target of increasing the recycling rate of household appliances by 15% by 2025 from the 2023 levels. The guidelines aim to achieve the targets through measures such as building pilot recycling cities, cultivating the recycling industry, promoting best practices/models, and developing regulations, policies, and standards.
 - On 13 March 2024, China's State Council issued an **action plan** to promote the large-scale replacement of equipment and consumer goods. This action plan sets the targets of doubling the rate of vehicle recycling and increasing the recycling rate of household appliances by 30% by 2027 from 2023 levels.
 - On 29 March 2024, China's Ministry of Finance released the **Management Measures on the Special Fund for the Treatment of Waste Electrical and Electronic Products (Draft for Public Comments)**. This document proposes to allocate government funds to support waste electrical and electronic product recycling and disposal.
 - On 24 June 2024, the China Ministry of Ecology and Environment announced during its monthly **press conference** the next steps for implementation of the March 13 action plan mentioned above, including releasing the Work Plan for Regulating the Environmental Supervision of Waste Equipment and Consumer Goods Recycling and Disposal and carrying out special enforcement actions to control environmental pollution caused by the illegal dismantling of waste equipment and consumer goods.
 - On 24 July 2024, the China National Development and Reform Commission and Ministry of Finance **announced** around 300 billion RMB (13.77 billion USD) of ultra-long-term special government debt funding to support implementing the March 13 action plan mentioned above. The special government debt funding will be used to, among other things, support consumer goods replacement, recycling and disposal, including:
 - Subsidizing individual consumers in replacing their higher-emission gasoline fueled passenger cars (at and below level 3 of the national emission standard) or older new-energy passenger cars (registered on or before 30 April 2018) with selected new-energy (subsidy at 20,000 RMB (2,754.5 USD) per car) and selected new gasoline (subsidy at 15,000 RMB (2,065.9 USD) per car) fueled passenger cars;
 - Subsidizing individual consumers in purchasing energy-efficient household appliances, including refrigerators, air conditioners, and others, for 15% of the product sales price for appliances with level 2 energy efficiency; and for an
-

- additional 5% of the product sales price for appliances with level 1 energy efficiency (subsidy per product is up to 2,000 RMB (275.5 USD)); and
- Providing 7.5 billion RMB (around 1 billion USD) in national government funding to support the recycling and disposal of waste electrical and electronic products in 2024.

These policies would benefit from additional measures that increase the demand for reclaimed refrigerants, such as a government edict that specific types of cooling equipment must use an increasing amount of reclaimed refrigerants to reduce the demand for newly produced fluorocarbon refrigerants and minimize the release of fluorocarbon emissions into the atmosphere. Additionally, strengthened monitoring, reporting, and enforcement of refrigerant emissions reduction and proper disposal requirements, incorporating best industry practices and technologies, will be needed to maximize the climate benefits of these policies and funding mechanisms.

Institute For Governance & Sustainable Development (IGSD), 24 July 2024

Image: IGSD

8. Indonesia Sets Path for Climate-Friendly Cooling with National Cooling Action Plan

- In 2020, cooling services account for 30 per cent of electricity use nationally
- Indonesia's space cooling demand is projected to increase nearly 400% by 2040
- Sustainable cooling is key to protect vulnerable populations, keep food fresh, medicines viable, and workforces productive
- In Indonesia, 33.6 million rural and poor are at high risk due to a lack of access to cooling.
- Indonesia's electricity consumption for cooling is projected to rise from 79 TWh in 2020 to 183 TWh in 2030 and 265 TWh in 2040.
- Indonesia's cooling requirements are projected to release total greenhouse gas emissions of 184 million tons of CO₂e in 2030 and 233 million tons of CO₂e in 2040.
- The potential electricity savings by 2040 are estimated to be 137 TWh for space cooling and 7 TWh for the food cold chain sector



Jakarta, 6 August 2024 – The Indonesian government launches its first National Cooling Action Plan (I-NCAP) in Bali. This first of its kind inter-ministerial initiative addresses one of the most significant contributors to global warming, guiding Indonesia towards a greener, cooler, and net-zero future.

The I-NCAP focuses on five critical areas: building space cooling, food cold chains, healthcare cold chains, mobile air conditioning and process cooling, and aligns with Indonesia's

enhanced Nationally Determined Contribution (NDC). Developed with support from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Environment Programme (UNEP) and inputs from Sustainable Energy for All within the framework of the Cool Coalition, the I-NCAP represents a comprehensive policy roadmap to address increasing cooling demand, enhance energy efficiency in cooling appliances, and promote the use of low-global warming potential (GWP) refrigerants.

“The launch of Indonesia’s National Cooling Action Plan marks a crucial step in our commitment to protect our people from extreme heat with climate-friendly cooling solutions. This National Cooling Action Plan will serve as a systematic and comprehensive framework to realize lower energy demand and emissions while improving the resilience of our population and economic sectors,” said Dr. Eniya Listiani Dewi, Director General of the Directorate General of New, Renewable Energy, and Energy Conservation (EBTKE) under the Ministry of Energy and Mineral Resources.

The I-NCAP is an inter-ministerial policy roadmap led by the Directorate General of New, Renewable Energy, and Energy Conservation (EBTKE) and includes collaboration from numerous national stakeholders. In a statement on the occasion of the launch, Mr. Hongpeng Liu, Director of the Energy Division of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), *“As the result of exemplary cross-ministerial and multi-agency collaboration, Indonesia’s National Cooling Action Plan stands as a beacon of the integrated approach needed to address the complex challenges of sustainable development in the context of our changing climate. This initiative not only underscores Indonesia’s commitment to sustainable cooling but also sets a benchmark for other nations to follow in working towards a more resilient, energy efficient and climate-friendly future.”*

In 2020, the total electricity consumed by space cooling in Indonesia’s buildings and the food cold chain sector combined was 79 TWh, equivalent to 30 per cent of the nation’s total electricity consumption. In the absence of effective interventions in the building sector, electricity demand is expected to rise nearly 400%, from 62 TWh in 2020 to 241 TWh by 2040. However, through targeted policy interventions, market enablers and regulatory enforcement, technological and financial interventions, and capacity building strategies, the I-NCAP aims to mitigate this rise by 57 per cent, capping space cooling demand in buildings at 104 TWh by 2040.

Ms. Ruth Zugman do Coutto, Chief of the Mitigation Branch of the Climate Change Division of the UN Environment Programme (UNEP) said, *“The I-NCAP follows comprehensive vision to delivering on cooling, looking at the multiple cooling sectors to ensure thermal comfort in buildings, strengthening resilience to extreme heat, and bringing essential life-preserving services like vaccines and safe food to all people while driving climate action. We applaud Indonesia’s leadership in releasing this plan and encourage the continued collaboration among ministries and stakeholders to pursue its implementation and ensure a cooler, more sustainable future for millions of people.”*

As the world approaches the G20 Clean Energy Ministerial and COP29, the launch of the I-NCAP will showcase Indonesia’s leadership in the cooling sector and the nation’s commitment to innovative, sustainable cooling solutions, driving global action on climate-friendly cooling. At the same time, its success hinges on Indonesian ministries, industry stakeholders, and international partners joining forces in supporting the implementation of the I-NCAP. Towards this, the EBTKE Director General stated, *“We call upon the international*

community to join Indonesia in implementing this plan, ensuring sustainable access to cooling for all. Together, we can pave the way for a greener future, mitigating climate impacts while fostering innovation and resilience in our cooling sector.”

Cool Coalition, 6 August 2024

Image: Cool Coalition

9. Cambodia’s construction sector all-in on passive cooling strategy

In a groundbreaking step towards sustainable construction, the Institute of Technology of Cambodia (ITC) hosted a pivotal workshop in Phnom Penh, aiming to revolutionise the nation’s building practices.



This two-day event, which concludes today, focused on passive cooling strategies and is part of a broader initiative to reduce energy consumption and combat climate change in Cambodia.

The event is part of the broader “Implementation of Passive Cooling Solutions in Cambodia” project, led by the Ministry of Environment, in partnership with the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) and the United Nations Environment Programme (UNEP), with funding from the Clean Cooling Collaborative.

Kinnaeth Vongchanh, head of the Thermal Laboratory at ITC and Programme Manager of the Cambodia Energy Manager and Audition Training (CEMAT), emphasised the workshop’s focus on educating professionals from diverse fields, including engineering and architecture, on passive cooling strategies.

“The goal is to bring together the Community of Practice (COP) and equip them with the knowledge and tools needed to implement these strategies effectively,” said Vongchanh, who is also lecturer-researcher.

The workshop demonstrated the application of passive cooling techniques in real-world settings by integrating data collected from actual houses in Cambodia into simulation models.

These models allow stakeholders, engineers, and architects to visualise the impact of passive cooling solutions on energy efficiency and greenhouse gas emissions.

“By adopting passive cooling strategies, we aim to reduce the reliance on energy-intensive mechanical ventilation systems, which are a significant contributor to carbon emissions,” Vongchanh explained.

One of the key aspects discussed during the workshop was the need for a multidisciplinary approach. Vongchanh highlighted the importance of cross-functional understanding among professionals.

“Engineers should grasp design concepts, and architects should understand the principles of heat transfer and energy efficiency. This synergy is crucial for creating buildings with minimal energy consumption,” she noted.

The project, launched in March 2023, is still in its early stages, and its success will be evaluated over the long term. Vongchanh acknowledged the challenges in measuring the project’s impact but stressed the importance of ongoing collaboration and knowledge sharing.

“This is a step-by-step process, but with consistent effort, we hope to see significant changes in building design and energy consumption,” she said.

To address the issue, Cambodia has also adopted the National Cooling Action Plan, along with its updated Nationally Determined Contribution (NDC) to the Paris Agreement, prioritise passive cooling strategies to reduce demand, energy consumption, and greenhouse gas emissions.

The workshop also touched on the importance of adapting traditional Cambodian building techniques to modern contexts. “In the past, Khmer-style houses incorporated passive cooling naturally, with green spaces and tree cover,” Vongchanh reflected. “As civilisation advanced, we moved away from these methods, but it’s time to bring them back into contemporary design.”

Looking ahead, Vongchanh expressed optimism about the potential impact of the project. She mentioned that the government plans to develop areas with new building types that comply with passive cooling strategies.

“If we can demonstrate the benefits through simulation and real-world applications, we may see a shift in how buildings are designed in Cambodia. This could lead to a broader adoption of sustainable practices across the country,” she added.

The workshop marks a pivotal moment in Cambodia’s journey towards sustainable building practices, with the potential to reshape the construction sector by reducing energy consumption and fostering a more environmentally friendly built environment.

The trainer, Rajkumar Balasubramaniyan, COO at Design Solutions Private Limited, discussed the importance of passive cooling strategies (PCS) in architecture to enhance energy efficiency and reduce reliance on air conditioning.

He explained that insulating roofs, using proper ventilation, and incorporating natural features like vegetation can significantly reduce heat in buildings. These methods not only lower energy consumption but also provide thermal comfort, reduce electricity costs, and decrease the carbon footprint.

Balasubramaniyan emphasised that PCS can adapt buildings to climate change, making them more durable and resilient even during power outages. He highlighted various PCS methods, including shading, reflective roofing, green roofs, and natural ventilation, which help in maintaining indoor air quality and comfort.

Additionally, PCS contributes to environmental sustainability by mitigating the urban heat island effect and promoting biodiversity. Balasubramaniyan addressed common

misconceptions, asserting that PCS is cost-effective, applicable to both new and existing buildings, and suitable for all types of architecture, not just traditional designs.

He presented examples of buildings that have successfully integrated PCS, demonstrating their effectiveness in climates similar to Cambodia.

The workshop will conclude with a site visit to understand the monitoring equipment in Urbanland Borey Chankiri in Phnom Penh this afternoon and the passive cooling strategies implemented in the building.

Source: Khmer Times, 13 August 2024, By Ben Sokhean

Image: Chan Sarin, Head of the Industrial and Mechanical Engineering Department at ITC, addresses the workshop at the Institute of Technology of Cambodia in Phnom Penh yesterday. KT/Chor Sokunthea

LATIN AMERICA AND CARIBBEAN

10. Educating on Ozone Layer Protection and Mitigation of Climate Change

Santiago, Chile, 31 July 2024 – The artistic exhibition "What cools the air but heats the sky" was presented in Santiago de Chile (30 July - 2 August) as an educational initiative that aims to highlight the contribution of the Montreal Protocol and its Kigali Amendment to ozone layer recovery and the fight against accelerated climate change.



The exhibition's main objectives include increasing the visibility of the Montreal Protocol and its Kigali Amendment, empowering National Ozone Officers, and other Government Officials in Latin America to adapt and communicate the message to national audiences.

Additionally, the exhibition seeks to gather feedback from visitors to assess its impact and continuously improve it. Visitors can interact with the exhibition, share their suggestions and ideas, and provide feedback at the end of their visit.

"It is very important to raise awareness about the current stage of the Montreal Protocol, and especially of the Kigali Amendment. Therefore, the exhibition aims to increase visibility of the work done to date in an interactive and environmentally friendly manner. It is currently being presented in Santiago, but our goal is to showcase it in other regions," said Anne Fenner, Information Officer, UNEP OzonAction.

Exhibition Structure

Designed with three specific routes, the exhibition offers different approaches according to the audience. The first route, aimed at government officials, highlights the achievements of the Montreal Protocol and the Kigali Amendment, the network of countries collaborating to mitigate climate change, and the promotion of gender equality and women's participation in the sector.

The second route, for the general public, provides an introduction to environmental challenges related to the ozone layer, ozone-depleting substances (ODS), and high global warming potential (GWP) refrigerants. It also explains the evolution of the Montreal Protocol and its projects for the progressive phase-out of HCFCs and phasedown of HFCs, concluding with practical advice for responsible use of refrigeration systems.

The third route, intended for technical personnel and refrigeration specialists, offers information on the environmental impact of refrigerants, energy efficiency, sustainable cold chains, and best practices in handling alternative substances.

These three routes allow visitors to choose topics of interest while encouraging curiosity to explore the other routes, creating a dynamic and immersive experience.

"We aim to convey valuable content about the Montreal Protocol and its amendments, ensuring inclusive language to promote a diverse and equitable working environment," noted Yanelit Ruiz, UNEP consultant.

In summary, the OzonAction artistic exhibition aims to inform and raise awareness among diverse audiences about the importance of protecting the ozone layer, adopting sustainable practices, and actively engaging in mitigating accelerated climate change. This initiative is expected not only to increase the visibility of the Montreal Protocol and its Kigali Amendment but also to inspire concrete actions for a more sustainable future.

Contact: [Anne-Maria Fenner](#), Information Officer

UNEP OzonAction, 31 July 2024

Image: UNEP-OzonAction-ROLAC

11. Chile como modelo para la regeneración de gases refrigerantes en República Dominicana

Este 6 de agosto, la empresa Zona Frío de República Dominicana visitó uno de los centros de regeneración de gases refrigerantes en Chile, Regener Chile. Carlos Pérez, presidente de Zona Frío, acompañado por Lorena Alarcón de la Unidad Ozono del Ministerio del Medio Ambiente de Chile, pudo conocer de cerca las prácticas y tecnologías empleadas en la regeneración de refrigerantes, con el objetivo de replicar esta experiencia en su país.



«Vinimos para observar el proyecto de éxito de Regener, con el propósito de iniciar e implementar este trabajo en nuestro país. Conocer el funcionamiento de la regeneración de refrigerantes nos ayuda a entender cómo implementar los métodos necesarios para

recuperar estos gases y aprender sobre su almacenamiento, especialmente considerando que actualmente no existen instalaciones de este tipo en República Dominicana”, señaló Carlos Pérez.

La experiencia chilena demuestra cómo se puede reducir significativamente la emisión de refrigerantes al ambiente, promoviendo su reutilización, reciclaje o destrucción controlada. «Conocemos la importancia de la reducción de refrigerantes para el medio ambiente, por lo que nuestro objetivo es evitar liberar estos gases, de manera de minimizar nuestra huella en el mundo y mostrar que es posible hacer algo por nuestro planeta» subrayó Pérez.

Durante la visita, los profesionales exploraron las posibilidades de establecer alianzas público-privadas, como ha sido el caso de Chile, para garantizar una gestión integral de estos gases, desde su recuperación hasta su disposición final. «Es crucial lograr comprender y dominar, tanto los aspectos comerciales como legales, y obtener los permisos ambientales necesarios para operar. Creemos que, si logramos establecer todo esto, podríamos iniciar una planta en aproximadamente un año», adelantó Carlos Pérez.

Lorena Alarcón, de la Unidad Ozono, destacó la relevancia de proyectos como Regener para la protección de la capa de ozono y el cumplimiento de la Enmienda de Kigali, que busca reducir gradualmente la producción y el consumo de hidrofluorocarbonos (HFC), compuestos con un alto potencial de calentamiento global.

La experiencia chilena en regeneración de gases refrigerantes no solo representa un avance significativo en la gestión ambientalmente responsable de estos compuestos, sino que también ofrece un modelo replicable en otros países de la región, como República Dominicana, para contribuir a la protección ambiental y al cumplimiento de compromisos internacionales.

Ministerio del Medio Ambiente de Chile, 7 Agosto 2024

Image: Ministerio del Medio Ambiente de Chile

WEST ASIA



12. Workshop to exchange experiences between Egypt and Iraq

البيئة تعقد ورشة عمل لتبادل الخبرات بين مصر والعراق

اختتمت فعاليات ورشة عمل "تبادل الخبرات وتعزيز التعاون الفعال بين وحدة الأوزون المصرية والمركز الوطني للأوزون بالعراق في مجال اتفقيه فيينا و بروتوكول مونتريال" التي نظمتها وزارة البيئة من خلال وحدة الأوزون ، وذلك في إطار

توجيهات الدكتور فؤاد ياسين وزير البيئة بتكثيف الجهود لتقليل الغازات المسببة للاحتباس الحراري للحفاظ على البيئة، وتوطيداً لأواصر التعاون بين الجانبين المصري والعراقي، بحضور الدكتور علي أبو سنه الرئيس التنفيذي لجهاز شئون البيئة، والاستاذة سها طاهر رئيس الادارة المركزية للتعاون والعلاقات الدولية، والدكتور عزت لويس منسق مشروعات بروتوكول مونتريال، الدكتور علي محمود مدير مشروع الدعم المؤسسي لبروتوكول مونتريال، وممثلي المركز الوطني للأوزون بالعراق ووزارة الصناعة والمعادن العراقية، وعدد من المتخصصين والخبراء من وزارة البيئة.

واوضحت البيئة في بيان لها اليوم، انه قد قام الدكتور علي أبو سنه الرئيس التنفيذي لجهاز شئون البيئة بتوزيع شهادات اجتياز الدورة على المشاركين، مؤكداً أن الورشة تضمنت مجموعة من الأنشطة والزيارات الميدانية حيث تم زيارة أحد مراكز التدريب الخاصة بالتعليم الفني، الذي تم تجهيزه ضمن أنشطة البرنامج المصري لحماية طبقة الأوزون، بالإضافة إلى زيارة ميدانية لبعض شركات صناعة أجهزة التكييف والتبريد المنزلي والتي أتمت توفيق أوضاعها كأحد ثمار البرنامج المصري لحماية طبقة الأوزون، وتنظيم الزيارة ميدانية لعدد من مصانع والتكيف للتعرف على تجربتهم في تطبيق معايير السلامة البيئية وترشيد استهلاك الطاقة. التبريد وواضح رئيس جهاز شئون البيئة أن الورشة ناقشت مجموعة من الموضوعات التي يرغب الجانب العراقي في الاستفادة من التجربة المصرية في مجال إنشاء بنك الهالون، انشاء مركز استصلاح وسائط تبريد، برامج تدريب العاملين بالجهات المعنية بتنفيذ البرنامج الوطني، وكيفية حساب خط اساس استهلاك المواد الخاضعة لتعديل كيميائي، وعمل دراسة لتقييم المخاطر وقبول الأسواق للمنتجات التي تعتمد على تكنولوجيا صديقة للبيئة.

وتضمنت فعاليات الورشة استعراض مشروع تجريبي تم تنفيذه بين وزارة البيئة مع شركات صناعة أجهزة التبريد والتكييف، بهدف الوصل إلى أفضل البدائل، وقد تم استعراض أول مركز لاستصلاح غازات التبريد في مصر وكيفية التسويق له للاستفادة منه مستقبلاً، كما تم مناقشة خطط التدريب الخاصة بمراقبة الأسواق الداخلية والخارجية لضمان إحكام الرقابة على وسائط التبريد، وقد تم تنظيم زيارة للوفد العراقي لبعض شركات صناعة أجهزة التكييف والتبريد المنزلي والشركات المتخصصة في صناعة قطاعات السندوتش بانل وغرف التبريد وصناديق النقل المبرد، بالإضافة إلى عدد من الزيارات الميدانية الأخرى.

وقد ساهمت الورشة في تعزيز التعاون وتبادل الخبرات بين الجانبين المصري والعراقي في مجال حماية طبقة الأوزون، ومن المتوقع أن تثمر هذه الورشة عن مشاريع مشتركة وخطط مستقبلية لتعزيز القدرات الوطنية.

وعلى هامش الورشة تم عقد حلقة نقاشية تضمنت إنجازات البرنامج المصري لحماية طبقة الأوزون، والالتزامات الوطنية الخاصة باتفاق كيجالي لبروتوكول مونتريال، بالإضافة إلى تنفيذ دورة تدريبية بمبنى الإسكندرية تضمنت جولة ثقافية داخل مكتبة الإسكندرية وقلعة قيتباي، بحضور عدد من العاملين بمصلحة الجمارك والهيئة العامة للرقابة على الصادرات والواردات.

Albawaba News, 11 August 2024

Image: Albawaba news

NORTH AMERICA

13. Natural Refrigerant Technology Options for Food Retail – Webinar

Date: August 20

Time: 10 – 11 a.m. PST (1 – 2 p.m. EST)

Presenter: Ed Estberg, NASRC

State and federal regulatory pressures are driving an industry-wide transition away from traditional HFC refrigerants. Selecting the right replacement system for your facility can be a daunting task.

This webinar will review considerations and system options for retailers when transitioning from HFC refrigerants to future-proof natural refrigerants.



REGISTER HERE

The North American Sustainable Refrigeration Council (NASRC), August 2024

Image: NASRC

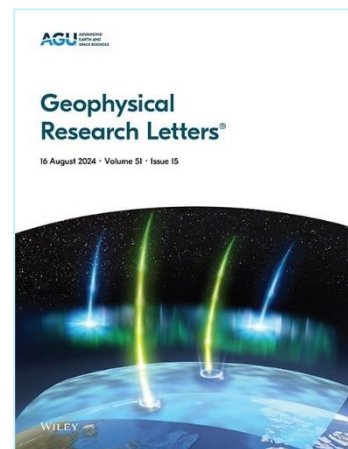
14. Chloromethanes in the North American Troposphere and Lower Stratosphere Over the Past Two Decades

[...] This study combines a large set of measurements to summarize and describe atmospheric chloromethanes over two decades over North America.

By analyzing all the data together we can better assess vertical gradients and trends from the ground to the lower stratosphere. These chloromethane species are both potent ozone-depleting substances in the lower stratosphere and are greenhouse gases, some with high warming potential. Therefore, knowing the vertical distribution is crucial for estimating the impact chloromethanes have upon radiative forcing, stratospheric ozone, and the ozone layer recovery.

In addition, aircraft observations contribute to evaluating the effectiveness of the Montreal Protocol regulations, ensuring compliance with current regulations and policy decisions regarding unregulated species.

As the abundance of longer-lived chloro-compounds governed by the Montreal Protocol continues to decrease, these four chloromethanes, with no or limited restrictions, will increasingly contribute to the Cl-abundance in the LS. Efforts to continue to reduce stratospheric Cl will need to focus on these unregulated chloromethanes (Villamayor et al., 2023). Airborne measurements are useful for quantifying compound mixing ratios after their distribution throughout the troposphere and LS. This is advantageous for reflecting



longer-term trends over larger spatial scales. Variability in distributions and trends derived from the 22-year of airborne measurements can be used to evaluate sources and sinks of the chloromethanes, which are essential for the development of efficient mitigation strategies and for climate modeling improvements and validation.

North America is a region of particular interest since the North American Monsoon Anticyclone is an efficient pathway for transporting chloromethanes to the LS.

The data in this study can therefore provide information on the mixing ratios, ODP, and trends of chloromethanes that can be used to update emission inventories and improve estimates of ozone hole recovery. [...]

Authors: Kate Smith, Elliot Atlas, Eric C. Apel, Donald R. Blake, Geoff Dutton, Rebecca S. Hornbrook, Steve Montzka, Jens Mühle, Sue Schauffler, Victoria Treadaway

American Geophysical Union (AGU), Geophysical Research Letters, Volume 51, Issue 15, 16 August 2024

Image: AGU

EUROPE & CENTRAL ASIA

15. National Ozone Units - Cool Training in Germany

One week of practical training and theoretical sessions lies behind a group of policy makers in the climate and ozone protection sector. They all participated in a training in Germany in June.



Technical knowledge is required to make reasonable political decisions – therefore, Proklima organized another Cool Training from 24th – 28th June 2024 for Policy Makers to provide them with deep-diving sessions about climate and ozone friendly refrigeration.

With the ever-growing demand for cooling, only natural refrigerants are truly sustainable and friendly to the ozone layer and the climate. The refrigeration and air conditioning (RAC) sector is responsible for up to 10% of the global emissions. Therefore, the sustainable transformation of the RAC sector towards the use of natural refrigerants and foam blowing agents needs to be promoted. Since June 2014, GIZ Proklima has launched Cool Training – a series of international trainings on the safe use of natural refrigerants in RAC appliances. The training is composed of theory and practical work, addressing the application of natural refrigerants for commercial refrigeration systems with focus on propane (R290), carbon dioxide (R744) and Ammonia (R717).

Participants were engaged in theoretical and practical training exercises of pipe connection, brazing and leakproof construction. The training instructor of BFS, Reiner Mayers, covered temporary and permanent pipe joining methods, as well as typical assembling and joining failures during the sessions.

The week-long training also covered the application of carbon dioxide as a refrigerant, Propane (R290) air conditioners (ACs), green cooling, ODS/HFC banks management, GHG Inventory/MRV, propane as a refrigerant in commercial refrigerant plants and practical training in refrigeration laboratory Installation and operation of cooling devices using R290.

An excursion to the Wilhelm Brandenburg GmbH & Co. factory in Frankfurt was arranged for the participants, whereby they learned about ammonia-based cooling systems, and the history of the butcher brand that has been producing fine meat, sausages and cold cuts since 1885. Participants were also able to access the ammonia plant on the property and get more hands-on learning on refrigerant grade ammonia-based cooling systems.

Participants that work as National Ozone Unit (NOU) officers and Climate Change Advisors within governmental ministries, development aid agencies, and international organizations from around the world were welcomed in Germany for the training program. 16 countries from South America, the Caribbean, Africa, Europe and Asia were represented in the training at the vocational training center Bundesfachschule Kälte-Klima-Technik (BFS) in Maintal, close to Frankfurt, Germany.

The training program provided a comprehensive and deeper understanding of the practical aspects of refrigeration systems. As a result of the diversity of the participants, the training also provided a full-circle learning environment for a pre-eminent approach to protecting the climate, the ozone layer and promoting technologies of the future.

Supported by...

Due to the diverse origins of the participants, the training was financed in different parts by different projects commissioned by the Federal Ministry for Development and Cooperation (BMZ), the Federal Ministry for the Environment and Consumer Protection (BMUV) and the Federal Ministry for Economic Affairs and Climate (BMWK) of the Republic of Germany (in the context of the International Climate Initiative). Other participants were financed by the United Nations Development Programme (UNDP), the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme OzonAction.

Green Cooling Initiative, 29 July 2024

Image: Green Cooling Initiative

16. Italian customs seize over 40 tonnes of illegal refrigerant

ITALY: Customs authorities have intercepted over 40 tonnes of illegal HFC refrigerant at the port of Gioia Tauro, Italy.

During a routine verification check, customs officers found that a shipment declared as dichloromethane (aka methylene chloride) was in fact fluorinated gas.

The shipment is said to have comprised 112 non-refillable cylinders, which are banned in Europe, and 3377 refillable cylinders. The cylinders containing non-refillable HFCs were subjected to emergency criminal seizure, while the refrigerant in refillable cylinders received an administrative seizure due to the importer exceeding its F-gas quota.



Neither the name of the importer, nor the refrigerant(s) involved, have been revealed. Customs photographs do indicate that some of the shipment may have been in ISO tanks.

In addition to possible criminal charges, those responsible face administrative sanctions from €50,000 to €150,000.

Gioia Tauro is situated on the south west Tyrrhenian coast on the tip of Italy near the island of Sicily. It is an important port, situated along the route connecting Suez to Gibraltar.

CoolingPost, 13 August 2024

Image: CoolingPost

How to set up and manage logbooks for refrigeration, air-conditioning, heat pump and other types of equipment - Background: This technical brief reflects the Polish experience of setting up and managing logbooks for refrigeration, air-conditioning, heat pump (RACHP) and other types of equipment. It also provides examples of similar equipment databases used in other developed and developing countries. It explains how equipment logbooks and electronic databases can facilitate a smooth hydrochlorofluorocarbon (HCFC) phase-out and hydrofluorocarbon (HFC) phase-down. It also provides guidance on the contents and format of the equipment logbooks, and on how to set up and manage the related databases. The Appendix describes the step-by-step approach for setting up and managing equipment logbooks and the relevant electronic databases. **This factsheet is available in [English](#) | [Russian](#)**



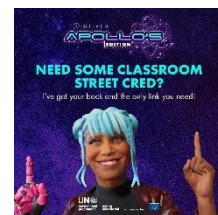
FEATURED

Overview for the meetings of the ozone treaties - Click [here](#) for upcoming and past Montreal Protocol Meetings dates and venues.

Avoided CO₂e - The CO₂e App available from the Ozone Secretariat aims to raise awareness and enhance understanding of the contributions of the Montreal Protocol and its Kigali Amendment to climate change mitigation.



New gaming technology to create environment simulation game for teenagers-The UN Environment Programme's (UNEP) Ozone Secretariat today launched a simulator game and avatar using the latest software technology. **Apollo's Edition** is the latest addition to the **Reset Earth education platform**. Targeting 13-18-year-olds, the free online education material developed provides educators with resources to teach students the importance of environmental protection.



Online introductory course 'International legal framework on ozone layer protection' - Designed for government representatives and national stakeholders new to the Vienna Convention and Montreal Protocol, students of environmental law, and anyone interested in learning about the ozone treaties, the **online course** launched by the Ozone Secretariat aims to provide an introduction to the international legal framework on ozone layer protection.



Free teaching kits on ozone layer and environmental protection

- New free online teacher toolkits and lesson plans based on the success of UNEP's Ozone Secretariat's [Reset Earth](#) animation and video game
- Targeting Tweens by adopting animation and gamification to create innovative online lessons to raise awareness on ozone layer and environmental protection
- Available online in digital and print format for universal access



Read/download >>> [Ozone Secretariat's education platform](#)

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

The Fund is dedicated to reversing the deterioration of the Earth's ozone layer. It was established by a decision of the Second Meeting of the Parties to the Montreal Protocol (London, June 1990) and began its operation in 1991. The main objective of the Fund is to

assist developing country parties to the Montreal Protocol whose annual level of consumption of the ozone depleting substances (ODS) chlorofluorocarbons (CFCs) and halons is less than 0.3 kilograms per capita to comply with the control measures of the Protocol. Currently, 147 of the 197 Parties to the Montreal Protocol meet these criteria. They are referred to as Article 5 countries.

The Multilateral Fund is managed by an Executive Committee with equal membership from developed and developing countries. Since the inception of the Fund, the Executive Committee has held 93 meetings. The Fund Secretariat, located in Montreal, assists the Executive Committee in its tasks. Projects and activities supported by the Fund are implemented by four international implementing agencies and a few bilateral agencies.

On 27 October 2023, the Thirty-Fifth Meeting of the Parties to the Montreal Protocol (35thMOP) decided on the replenishment of the Multilateral Fund for the triennium 2024-2026. The Parties agreed on a budget of US \$965 million for the triennium, a record amount.

As at 8 November 2023, the contributions received by the Multilateral Fund from developed countries, or non-Article 5 countries, totalled over US\$ 4.7 billion. The Fund has also received additional voluntary contributions amounting to US \$25.5 million from a group of donor countries to finance fast-start activities for the implementation of the HFC phase-down.

To facilitate phase-out by Article 5 countries, the Executive Committee has approved 144 country programmes, 144 HCFC phase-out management plans (HPMPs), 24 Kigali HFC implementation plans (KIPs), pilot projects to maintain and/or enhance energy efficiency in the context of HFC phase-down and has funded the establishment and the operating costs of ozone offices in 145 Article 5 countries.

New and updated guides and submission forms for the preparation of project proposals:

- Guide for funding requests for preparation of national inventories of banks of used or unwanted controlled substances and a plan for the collection, transport and disposal of such substances >>>
- Updated interim guide for the presentation of stage I of Kigali HFC implementation plans (July 2023) >>>
- Updated guide for the presentation of new stages of HCFC phase-out management plans (July 2023) >>>

All guides and submission forms are available [here](#)

- Click [here](#) for the Executive Committee upcoming and past Meetings and related documents.



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

OzonAction: Celebrating International Women's Day, 8 March 2024 - on the occasion of **International Women's Day (IWD)**, UNEP OzonAction would like to express our best wishes and sincere thanks to all our female colleagues working in National Ozone Units for your leadership, outstanding dedication, great intellectual input, and tireless work on the Montreal Protocol! This treaty is often referred to as the most successful multilateral environmental agreement to date, and both women and men take equal credit in making this amazing achievement possible. OzonAction is extremely proud of all the female **Ozone Officers, Assistant Ozone Officers, technical experts, and support staff**, as well the women in national stakeholder groups and partner organizations, notably those in the **refrigeration, air conditioning, and customs**. Through your work, you are providing girls and young women who are interested in pursuing careers in environmental protection with a role model by showing them that there are successful women in Montreal Protocol fields – you are indirectly investing in their future. [...]



- **Miruza Mohamed: A Woman Behind the Maldives' Environmental Transformation**
- **Samira de Gobert: Leading Change in Environmental Communication and Women's Empowerment**
- **Colleen Keyworth - From Family Roots to Industry Beacon: Leading Advocate for Women in HVACR**
- **Laura López: Impulsando la implementación del Protocolo de Montreal y la equidad de género en Guatemala**
- **Marta Pizano: A trailblazer's path from research to global policy**
- **Liazzat Rabbiosi: A Woman Facilitating International Environmental Policy-making**
- **Cecilia Mercado: Breaking Barriers-A legacy of environmental leadership and empowerment**
- **Sarah Nakanyika: A Woman Leading Cooling Advancement in Zambia**
- **Yvette Gauthe Boko: Une femme forte à la tête du Bureau national de l'ozone au Bénin**

Considerations for establishing national HFC Quota System - As HFC consumption in most countries is determined by their import, this document aims to highlight guiding principles and key aspects that countries need to consider when developing their import quota system. The underlying principles and approaches are equally applicable for production and export quota allocation. [Read/download the full document](#)



Every Action Counts: Kigali Amendment - UNEP 2022 - This brochure targets the general public and explains in a simplified manner what the Montreal Protocol and its Kigali Amendment signify. It includes actions that everybody can do to support the Kigali Amendment. It also covers the relationship between the Kigali Amendment and Sustainable Development Goals. It introduces examples of successful communication campaigns on the Kigali Amendment. [English](#) | [Spanish](#)



Gender Mainstreaming in the Montreal Protocol: Experiences in Latin America and the Caribbean -Taking into account that women and girls constitute half of the world's population and, therefore, represent half of the potential and innovation necessary to face the "triple planetary crisis" — climate change, nature and biodiversity loss, pollution and waste —, positioning people and the planet as central pillars of the transformation necessary to overcome it, and considering the guiding principles and the scopes of action of the Operational Policy on Gender Mainstreaming of the Multilateral Fund, the United Nations Environment Programme (Latin America and the Caribbean Office). [English](#) | [Spanish](#)



Refrigeration, Air-Conditioning, and Heat Pumps (RACHP) Associations & Organizations: This Knowledge Map provides a global directory of RACHP associations, societies, and organisations around the world. These are key stakeholders for ensuring safe and efficient refrigerant transitions.

Local Technical & Vocational Education and Training (TVET): This Knowledge Map provides a global directory of TVET entities and centres around the world. These are the strategic partners for conducting and promoting training and certification programmes related to the refrigeration servicing sector.

Click [HERE](#) to access the OzonAction Knowledge Maps tool
Click [HERE](#) to download the OzonAction Knowledge Maps tool flyer



Gas Card Tool: Web-based Visual Printable Cards of Refrigerant Gases

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 - 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)

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](#)

Updated OzonAction "WhatGas?" Mobile App

The OzonAction "WhatGas?" application is an information and identification tool for refrigerants gases: ozone depleting substances (ODS), HFCs and other alternatives. It is intended to provide some 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.

This latest release includes the 2022 Harmonized System (HS) Codes for HFCs and blends, which facilitates the process of inspection and identification of controlled and alternative substances.




Scan the QR code to download the app (*currently available for Android devices only*). If you've already downloaded the app, to update visit the [Google Play Store](#)

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](#).

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 hydrochlorofluorocarbons (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 field and follow in their footsteps. **Read/download the publication**



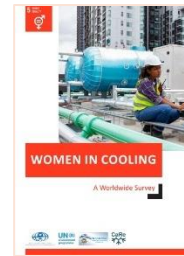
As part of IIR and UNEP OzonAction's partnership, a set of Cold Chain Technology Briefs was released over the past few years, which includes in-depth summaries about the cold chain in different key sectors. They include descriptions of technology, refrigerant options and trends and conclude with prospects and challenges. They cover the main cold chain sub-sectors, i.e., **Production & Processing, Cold Storage, Transport Refrigeration, Commercial & Domestic, and Fishing Vessels**. **Download the Cold Chain Technology brief in [English](#) | [French](#) | [Russian](#) | [Spanish](#)**



PUBLICATIONS

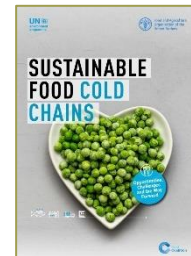
Results of a Worldwide Survey about Women in Cooling Released by IIR and UNEP OzonAction

Refrigeration, Air-Conditioning, and Heat-pumps (RACHP) are crucial for our health, nutrition, comfort, and well-being. It is one of the sectors that crosscuts many of the UN sustainable development goals and can contribute significantly to safeguard the environment, advance welfare of humanity and support the growth of employment and economics worldwide. Women are highly under-represented in this sector as indicated by the fact that only 6% of the members of national refrigeration associations/organisations/institutions are women. In order to better understand the background, motivation, challenges, and opportunities faced by women working in RACHP a worldwide survey was undertaken by the International Institute of Refrigeration (IIR) and OzonAction of UN Environment Programme (UNEP) in cooperation with several partners. **Read/Download the Full Report**

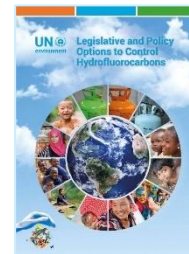


Sustainable Food Cold Chains: Opportunities, Challenges and the Way Forward-

This [UNEP-FAO] report explores how food cold chain development can become more sustainable and makes a series of important recommendations. These include governments and other cold chain stakeholders collaborating to adopt a systems approach and develop National Cooling Action Plans, backing plans with financing and targets, implementing, and enforcing ambitious minimum efficiency standards. At a time when the international community must act to meet the Sustainable Development Goals, sustainable food cold chains can make an important difference.



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**



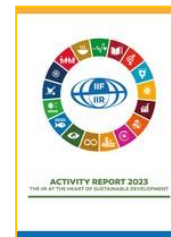
Green Cooling in public procurement How to advance the procurement of climate-friendly and energy-efficient cooling equipment in the public sector? Air conditioning in public buildings is often responsible for around 50% of total electricity consumption. Switching to climate-friendly cooling technologies ("Green Cooling") can reduce costs and energy consumption and improve the carbon footprint of public buildings. This study takes a closer look at the benefits of Green Cooling in the public sector and discusses current barriers and possible solutions. The information presented provides a solid basis to revise current procurement criteria for sustainable cooling systems in public buildings. **Read/Download the study**



Protecting the Ozone Layer - 35th Anniversary Edition - a new book celebrating the 35th Anniversary of the Montreal Protocol. **The electronic version (Kindle Edition) of the book has become available for purchase \$3.03 on Amazon.** The book highlights successes and documents innovation during the first 35 years and inspires new ambition to strengthen protection of stratospheric ozone and climate before Earth passes tipping points. The book tells the story of the Montreal Protocol, revealing a model of cooperation, collaboration, universal ratification, record of compliance with over 99 per cent of controlled ozone-depleting substances (ODSs) phased out, the ozone layer on the path to recovery, the 2007 Montreal Adjustment, and the 2016 Kigali Amendment moving the Montreal Protocol further into environmental protection. Unfinished business includes: HCFC phase out, ODS bank management, HFC phase down, uncontrolled ozone-depleting greenhouse gas nitrous oxide (N₂O), feedstock exemptions for plastics production, and dumping of obsolete cooling appliances.



The International Institute of Refrigeration (IIR) **IIR Activity Report 2023 | Rapport d'activité de l'IIF - 2023** is available online. It is a must-read for everything you need to know about advances in the field of refrigeration! Read/Download the full report to discover the IIR's actions and achievements in 2023 in its quest for a cooler, greener and more sustainable future! [English](#) | [French](#)



Navigating New Horizons A global foresight report on planetary health and human wellbeing - To help navigate current and future uncertainty and disruptive change, while effectively delivering on its mandate, UNEP has been implementing an institutionalized approach to strategic foresight and horizon scanning with the view to developing an anticipatory and future-oriented culture. This mirrors the growing interest and demand for foresight that is also reinforced by the United Nations reform agenda and the Secretary-General's report on 'Our Common Agenda', which calls for all UN agencies, as well as all UN member states, to engage foresight practices more deeply and apply the derived insights to address global systemic risks. This process has culminated in the development of the present report.





Click [here](#) for recent OzoNews Issues

Request a PDF of the current issue



Subscribe to OzoNews



UNEP, OzonAction, 1, rue Miollis, Bldg. VII – 75015, Paris • France