

## Volume XXIV | 30 November 2024

**Here's to the future, and to the incredible possibilities that await!**

Dear Readers,

As many of you are aware, the compulsory retirement date is now a reality for me. I joined the OzonAction team in March 1998. And after 26 years, my last day in the office is Friday, 29 November 2024.

I would like to take the opportunity of this OzoNews - that will be the latest prepared by me - to thank you for your continued interest and support. Since January 2000, there have been over 600 regular OzoNews issues, in addition to numerous other special releases, for an average of 160000 articles that were brought fortnightly to your inbox. Thank you also for the many spontaneous messages of appreciation received from many readers on the usefulness of this OzonAction service.

Assuming my responsibilities within the UNEP OzonAction team throughout the past 26 years was both a challenge and an honor. As a UN staff member, I had the privilege of meeting and working alongside some of the most dedicated and inspiring professionals in the world. All driven by a shared commitment to making this planet a safer place.

I am also honored that my work was recognized by prestigious awards: UN21, USEPA, Ozone Secretariat Award...), and I am also proud that some of the tools I conceptualized will be continued, such as "OzoNews" that will be continued by OzonAction, and the "Montreal Protocol Who's Who" that will be revived by the Ozone Secretariat.

As I look back on these incredible years, I am overwhelmed with gratitude for the countless memories, the friendships forged, and the lessons learned. I have no doubt that you will continue your mission to help save the ozone layer and to inspire the world with the same passion and innovation that contributed to the historical success of the Montreal Protocol.

Heartiest thanks to everyone who supported me on this journey. Here's to the future, and to the incredible possibilities that await!

Sincerely,

Samira Korban-de Gobert

Please contact [OzonAction Secretariat](#) for any questions.

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# GLOBAL

### 1. Kigali Amendment latest ratifications

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

[Papua New Guinea, 12 November 2024](#)

[Oman, 8 November 2024](#)

[Kuwait, 4 November 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. The return to 1980 stratospheric halogen levels: a moving target in ozone assessments from 2006 to 2022

### Abstract

The international scientific assessment of ozone depletion is prepared every 4 years to support decisions made by the parties to the Montreal Protocol. In each assessment an outlook of ozone recovery time is provided.



The year when equivalent effective stratospheric chlorine (EESC) returns to the level found in 1980 is an important metric for the recovery of the ozone layer.

Over the past five assessments, the expected date for the return of EESC to the 1980 level, for mid-latitudes, was delayed, from the year 2049 in the 2006 assessment to 2066 in the 2022 assessment, which represents a delay of 17 years over a 16-year assessment period.

Here, we quantify the primary drivers that have delayed the expected EESC recovery date between each of these assessments. We find that by using identical EESC formulations, the delay between the 2006 and 2022 assessments' expected return of EESC to 1980 levels is shortened to 12.6 years. Of this delay, bank calculation methods account for ~ 4 years, changes in the assumed atmospheric lifetime for certain ozone-depleting substances (ODSs) account for ~ 3.5 years, an underestimate of the emission of carbon tetrachloride accounts for ~ 3 years, and updated historical mole fraction estimates of ODSs account for ~ 1 year.

Since some of the underlying causes of these delays are amenable to future controls (e.g., capture of ODSs from banks and limitations on future feedstock emissions), it is important to understand the reasons for the delays in the expected recovery date of stratospheric halogens.

**Authors:** Megan J. Lickley, John S. Daniel, Laura A. McBride, Ross J. Salawitch, and Guus J. M. Velders

[European Geosciences Union \(EGU\) Atmospheric Chemistry and Physics, 27 November 2024](#)

Image: EGU

### **3. 2024 World Cold Chain Symposium, Focused on Building a Sustainable Cold Chain, Replay Now Available Online**

**Washington, DC – November 26, 2024** – The Global Food Cold Chain Council (GFCCC) and its partners the United Nations Environment Programme (UNEP) OzonAction and the Cool Coalition, and its sponsor



Carrier, announced today that the [replay of the 2024 World Cold Chain Symposium is now available online](#), and thank the speakers and live audience members once again for their participation at the Symposium in Bangkok, Thailand on the eve of the U.N. Montreal Protocol Meeting of the Parties on October 26<sup>th</sup>.

The Symposium brought together leaders from government, industry, nongovernmental organizations and academia to discuss the means of reducing food loss and waste through sustainable expansion of the food cold chain.

The 2024 Symposium focused on the theme of “Sustainable Growth: Building Business Models for Cold Chain Development” and expanded the cold chain conversation to include all facets of the sector. The program featured opening remarks from Meg Seki, Executive Director of the U.N. Ozone Secretariat, and Ed Dryden, President of Refrigeration for Carrier Corporation. The full speaker list is available on the Symposium website linked above.

The Symposium featured lively audience discussion following the experts sharing their knowledge and experiences of the end-to-end development of a sustainable cold chain. Topic areas included data gathering and modeling to establish the best practices for a market’s local and regional needs, the development of financing mechanisms for initial capital, human capacity building, and the technology needs. This holistic approach, which studied from all sides the development of a sustainable cold chain, took the high-level concepts from previous Symposiums and the results of the experts’ previous work experiences to provide real-world advice to the audience members. The full agenda of the Symposium included the following panels:

1. The Impact and Benefits of the Cold Chain
2. Technology for Cold Chains – Connecting the Dots

3. Training, Servicing and Capacity Building Issues – Challenges and Opportunities
4. Momentum in Financing Opportunities and Mechanisms

“Following the work done over the last several years to increase visibility of cold chain necessity, this event has highlighted how far we have come and how much further we must go in the pursuit of sustainable cold chain expansion,” said Kevin Fay, Executive Director of the Global Food Cold Chain Council. “Continuing to develop the sustainable cold chain will only improve the work for emissions reduction goals and decrease food loss and waste around the world. We thank our sponsors for continuing to work with us to highlight this important event.”

[The Global Food Cold Chain Council \(GFCCC\), 26 November 2024](#)

Image: GFCCC

#### **4. Operation Demeter X sheds light on the extent and trends of the trafficking of wastes and ozone depleting substances**

WCO Deputy Secretary General Ricardo Treviño Chapa attended the high-level debriefing and interim evaluation meeting of Operation DEMETER in Xiamen, China, from 19 to 21 November 2024, which was organized by the WCO in cooperation with China Customs and sponsored by China Customs Cooperation Fund (CCF-China).



Aiming to evaluate progress and chart future courses with Customs administrations and enforcement partners, the event saw the attendance of the Vice Minister of China Customs, officials from the European Anti-Fraud Office and the BRS Secretariat, and representatives from partner international organizations. Discussions helped identify new strategies and partnerships to support enforcement bodies.

Recognizing the exceptional achievements made throughout 10 iterations of Operation DEMETER since 2009, Ricardo Treviño Chapa declared: *“Operation Demeter gives an overview of the extent of environmental crime and of the need to increase vigilance. It is imperative to redouble our efforts to ensure a cleaner, safer, and more sustainable world.”*

Rolph Payet, Executive Secretary of the Basel, Rotterdam and Stockholm Conventions, highlighted in his speech that Operation DEMETER was a unique opportunity for countries to strengthen the implementation of the Basel Convention on the ground, and encouraged Customs and environmental authorities to develop strong relationships. [...]

### **Seizures illustrate the extent of illicit trade**

In the course of Operation DEMETER X, 450 seizures related to the targeted commodities were reported by 47 Customs administrations via CENcomm, the WCO's secure and encrypted communication tool.

These seizures included 324 seizures of waste, 99 seizures of ODS, HFCs and equipment containing or relying on controlled substances under the Montreal Protocol, and 27 seizures of other commodities, including restricted or prohibited commodities such as hazardous chemicals. In terms of quantities, cumulatively, 10,285,338.48 kg and 1,441,843 pieces (not weighed) were seized, including:

- - 9,839,184.93 kg of waste and an additional non-weighed 1,422,981 pieces of waste;
- - 344,625.9 kg of ODS & HFCs, and 24,198.9 kg and 11,620 pieces of equipment containing or relying on controlled substances; and
- - 77,328.75 kg and 7,242 pieces of other restricted or prohibited goods.

### **Substances controlled under Montreal Protocol**

17 Customs administrations reported seizures related to substances controlled under the Montreal Protocol and the Kigali Amendment, which entered into force in 2019. Administrations from Gambia, Bulgaria and Italy stood out in the number of seizures they reported. However, in terms of the quantity seized, Sri Lanka took first place, followed by Italy and North Macedonia.

HFCs were the most prominently trafficked known commodities both in terms of the number of seizures and the quantity seized, while unspecified controlled substances and mixtures topped the list in terms of quantity seized. Eight Customs administrations reported 27 seizures totaling 24,198.9 kg, along with an additional 11,620 pieces of equipment.

Vessels and vehicles were the predominant modes of conveyance both for substances controlled under the Montreal Protocol and for equipment containing or relying on the controlled substances. Most seizures took place at inland and

border posts and at seaports, with some seizures made at traders' and sellers' premises. Most seizures resulted from routine control.

### **Building capacities**

The WCO Secretariat provided guidance to participants ahead of Operation DEMETER X, in line with the Guidelines on the Implementation of WCO Operations at National Level. Additionally, participants received instructions and advice on developing risk profiles for targeted commodities.

Some officers participated in the workshops in Mauritius, China, and Senegal organized by the WCO Secretariat with the financial support of China Customs. These events brought together over 150 Customs officers and environmental stakeholders who carried out in-depth and practical exercises related to illegal trade in waste, ODS and HFCs. They also received training on the CENcomm tool which significantly improved the quality of the information they reported. In addition, 46 Customs officers designated as National Contact Points for Operation Demeter attended regional workshops organized by the Basel Convention Secretariat. [...]

### **Appreciation**

Operation DEMETER X received financial backing from China Customs and extensive technical support from the Regional Intelligence Liaison Office for Asia/Pacific. Additionally, a range of international partners, including the Basel Convention Secretariat, the United Nations Environment Programme (UNEP) OzonAction, the European Anti-Fraud Office (OLAF), the UNODC Unwaste Project, INTERPOL, and the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL), alongside the WCO RILO network, played pivotal roles in bolstering capacity building activities and facilitating information sharing within their respective networks.

[The World Customs Organization, 26 November 2024](#)

Image: WCO logo

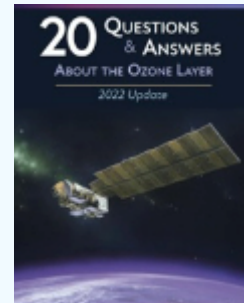
#### **NEW!**

The [Twenty Questions and Answers About the Ozone Layer](#) is now available in [Chinese language](#)

**Authors:** Ross J. Salawitch (Lead Author), Laura A. McBride, Chelsea R. Thompson, Eric L. Fleming, Richard L. McKenzie,



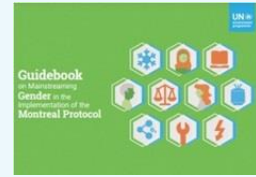
Karen H. Rosenlof, Sarah J. Doherty, David W. Fahey, *Twenty Questions and Answers About the Ozone Layer: 2022 Update, Scientific Assessment of Ozone Depletion: 2022*, 75 pp., World Meteorological Organization, Geneva, Switzerland, 2023.



[Industria Y Formazione 2024-2025 International Special Issue](#), joint international publication from UNEP, IIR, AREA, CSG under the auspices of Italian Ministry for Environment and Energy Safety. This 10<sup>th</sup> edition focus on the need to strengthen the RACHP workforce for the future challenges of the sector. It presents 24 sector-specific articles with contributions from global associations, institutions and organizations (such as AREA, AHRI, ASHRAE, ISHRAE, EPEE, FAIAR, U-3ARC, ...). The Publication has been introduced at Chillventa 2024, and officially launched at the 36<sup>th</sup> Meeting of the Parties to the Montreal Protocol in Bangkok, Thailand.



[Guidebook on Mainstreaming Gender in the Implementation of the Montreal Protocol](#) OzonAction, in consultation with UN Women and a gender expert, developed this guidebook 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 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. [Learn more/ submit nomination >>>](#)



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 beyond 2022.

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

Image: Sustainable cold chains website



**AFRICA**

## 5. African cooling experts call for continent-wide training focus

U-3ARC organisation says more must be done to support training to manage the increased availability of higher flammability refrigerants in a number of African countries



Refrigeration experts in Africa have called for wide-ranging industry training programmes across the continent to ensure the safe and effective use of higher flammability refrigerant. Pan-African cooling body U-3ARC said that much greater awareness and educational support was needed in a number of African countries where engineers were being put at danger by not having access to skills programmes on working with alternative refrigerants.

The organisation said that a failure to provide consistent, effective skills programmes across the continent risk undermining efforts to move towards more systems designed for lower GWP refrigerants that re needed to protect national and regional cold chains.

U-3ARC [warned in a blog-post](#) that reports had been received from countries including Kenya, Zambia and Nigeria of fatal explosions linked to a lack of handling programmes for ensuring the safe and energy efficient use of lower GWP refrigerants.

The trade said it was calling for suppliers and other parts of the industry to do more to implement training on new types of equipment and refrigerants. This work would need to be backed with the proper tools in order to support the effective management of cold chains and other critical cooling functions, U-3ARC added.

A statement from group said: “New refrigerants are certainly eco-responsible, but they are nonetheless flammable. Because they are flammable, they necessarily require prior training for refrigeration technicians, with adequate tools and kits.”

“Any mishandling of these refrigerants could lead to a series of fatal explosions that we will experience more and more in Africa, if training is not placed at the centre.”

The comments were made following U-3ARC's election in November for a new Executive Board that will aim to lead its work across the continent.

Some of the key appointments included Madi Sakande continuing in his role as the president of the organisation, with Saïd El Harch serving as vice president of the body.

Mr Sakande has been a vocal proponent for ensuring that the RACHP industry and policy makers -both in Africa and at a global level - are ensuring that the RACHP sector across Africa is being effectively supported to deliver more sustainable and affordable cooling.

Adlain Florent was announced as the Secretary General of the group.

U-3ARC announced that Raoudha Massaoudi from Tunisia would serve as the secretary of the organisation's Women's Mobilisation programme, with Sarah Nakanyika of Zambia serving as deputy secretary.

U-3ARC said that it has helped establish [the first training and certification centre in Africa for its members.](#)

The El Andalouss Formation à la Carte (EAFC) site in Tunis, scheduled to open next February, aims to support learners from across Africa with ensuring best practice in the management and maintenance of refrigeration and air conditioning systems.

It will be operated in a partnership that includes U-3ARC, the EAFC management team and Italy-based training specialists, Centro Studi Galileo.

Up to 20 learners a week will be able to undergo training and certification programmes when the centre opens. This work will align with international standards.

U-3ARC added that the training centre was expected to be the first of a wider number of training centres to aid members across Africa with skills development and the move towards lower GWO refrigerant.

[Refrigeration & Air Conditioning \(RAC\), 26 November 2024](#)

Image: RAC

**See also >>>** The [November's RAC Magazine](#) digital edition.

## 6. Fed Govt launches AGORA project to curb greenhouse gas emissions - Nigeria



The Federal Government has launched the Abating Greenhouse Gas Emission from Obsolete Refrigeration and Air Conditioning (AGORA) Equipment project, a bold initiative aimed at reducing greenhouse gas (GHG) emissions and addressing climate change.

The project, launched at a workshop organised by the Federal Ministry of Environment through the National Ozone Office, in collaboration with the Energy Commission of Nigeria, the United Nations Environment Programme (UNEP-U4E), and the United Nations Development Programme (UNDP).

The workshop with the theme: “Abating Greenhouse Gas Emissions from Obsolete Refrigeration and Airconditioning Equipment in Ghana and Nigeria,” emphasised the project’s potential to promote energy-efficient and climate-friendly cooling technologies in Nigeria and Ghana.

Speaking at the workshop, National Ozone Officer at the Federal Ministry of Environment, Mr. Idris Abdullahi, outlined the project’s goals, emphasising its focus on transitioning to energy-efficient and low global warming potential (GWP) technologies.

He noted that the AGORA project, slated to run for three years, will strengthen policies to phase out old and inefficient refrigeration and air conditioning equipment that use high-GWP refrigerants.

“The AGORA project that we are launching today presents another opportunity for us to further advance our efforts towards the promotion of Energy Efficient and

Low GWP technologies in the RAC sector by Establishing and strengthening policies, regulations and partnerships to ensure the success of the transition to Energy Efficient and Low GWP RAC equipment thereby leading to the reduction of GHG emissions at the equipment's end of life and transforming the RAC market through ambitious replacement programmes for old and in-efficient equipment using high GWP refrigerants, initiating market transformation in the air-conditioning sector in Africa and also supporting South-South cooperation between Nigeria and Ghana, since the project will be implemented in both countries”.

Abdullahi recalled that Nigeria is a party to the Montreal Protocol on Substances that deplete the Ozone Layer and has ratified all its Amendments, the recent being the Kigali Amendment on phase-down of Hydrofluorocarbons, which are greenhouse gases used mainly as cooling agents in the refrigeration and air-conditioning sector.

He said, “Over the past three decades, Nigeria has been implementing the Protocol’s Ozone Depleting Substances Phase out Programme in the relevant sectors, such as Refrigeration, Air Conditioning, and Foam, among others”.

A representative of the Energy Commission of Nigeria, Dr. Shehu Mustafa, highlighted the initiative’s alignment with Nigeria’s climate goals.

He stressed that the project will shape the future of air conditioning and refrigeration standards in the country, contributing to sustainable energy access and economic growth.

UNDP Regional Technical Advisor for Africa, Mr. Joel Darkwah, praised Nigeria’s proactive role in implementing the Montreal Protocol and its Kigali Amendment, both aimed at phasing out harmful refrigerants. [...]

The AGORA project builds on Nigeria’s decades-long commitment to the Montreal Protocol on Substances that Deplete the Ozone Layer. It will support energy-efficient technologies, promote sustainable cooling options, and accelerate the transition to environmentally friendly alternatives in residential and commercial sectors.

[The Nation Newspaper, 27 November 2024, By Juliana Agbo](#)

Image: The Nation

## ASIA AND THE PACIFIC



### **7. Asia-Pacific kicking-off preparation of strategy for managing unwanted ODS/HFC**

**Clark, Philippines, 13 - 15 November 2024** – UNEP’s OzonAction Asia-Pacific Compliance Assistance Programme (CAP) team organized the Joint Thematic Workshop of Southeast Asia (SEA) and Pacific Island Countries (PIC) National Ozone Officers (NOOs). The workshop brought together experts and partners to discuss critical issues related to the management of ozone-depleting substances (ODSs) and hydrofluorocarbons (HFCs). The sessions focused on policy, management options and initiatives in the region for managing banks of used and unwanted controlled substances, aiming to strengthen the capacity of NOOs in the region.

The workshop tackled challenges of managing used or unwanted controlled substances in the Southeast Asia and Pacific Island Countries region. These substances threaten the ozone layer and contribute to global warming. The Montreal Protocol and its Kigali Amendment provide a framework for addressing this issue, but the lack of infrastructure and expertise in many developing countries has hindered effective management.

The workshop was designed to equip the NOOs with requisite knowledge and skills to effectively manage used or unwanted controlled substances. This encompassed a comprehensive understanding of the definition and methodology for preparing an



inventory of banks, elucidating the concept of sound management, and assessing the options most suitable for each country's unique context. Moreover, the workshop explored potential policy frameworks and options for effective management of unwanted controlled substances, potential financial resources to sustain the operation, and the roles of relevant stakeholders in the management of these substances.

The workshop has yielded several key takeaways for the countries. Regarding the life-cycle refrigerant management (LRM), the sessions emphasized the importance of a holistic approach to managing refrigerants throughout their entire life cycle, including leak prevention, recovery, recycling, reclamation, destruction, and end-of-life equipment management. Participants discussed the needs for comprehensive inventories to track refrigerants, identify facilities and their capacities, and understand current practices. This information is crucial for effective decision-making, policy development, financing, and monitoring progress. It also highlighted the importance of enforceable regulatory frameworks tailored to each country's context. Collaboration and industry engagement were identified as crucial factors for the success of LRM programmes. By bringing industry stakeholders on board, countries can promote collaborative responsibility, cost-sharing, and the long-term viability of LRM schemes.

*"This workshop is organized at the right time when Article 5 countries are preparing the national inventories of banks of used or unwanted controlled substances and a plan for the collection, transport and disposal of such substances, including consideration of recycling, reclamation and cost-effective destruction under the Multilateral Fund. The life-cycle refrigerant management is complex subject and is a new area of work that the National Ozone Unit needs to focus in the next 2 years. Experience sharing and discussion during this workshop is very helpful for us to understand more on this subject to enable us to prepare comprehensive national inventories of banks and a plan of action" - said Ms. Suryanti Jumin, the National Ozone Officer of Brunei Darussalam.*

During the workshop through the breakout session, countries also identified several challenges faced in implementing LRM, including data availability and reliability issues such as incomplete records and unreliable data from the stakeholders due to the absence of centralized databases and a lack of mandatory regulations for substance/equipment tracking and reporting of movement - all of which impede the development of accurate inventories. Regulatory and legislative challenges stemming from a lack of compulsory requirements for proper management of

controlled substances throughout its life cycle e.g., requirements for mandatory recovery and reuse of controlled substances, while virgin substances are available at affordable prices and unclear definitions by local regulations whether recovered substances are classified as “used” or “waste”. Technical and infrastructure limitations, including, a lack of recovery cylinder and recovery machine, lack of refrigerant identifier to ensure no cross contamination during recovery of substances, unavailability of centralized reclamation/destruction facility, which hinders the collection effort by the industry. With the above challenges, in most Article 5 Parties, there is no established mechanism to sustain the operation of LRM.

*“As a new National Ozone Project Officer and given Cook Islands being part of the regional project, this workshop has been invaluable in understanding the management of unwanted ODS and HFC banks. The knowledge gained on sound practices and stakeholder roles will significantly enhance our capacity to understand what is needed to implement effective strategies and meet our commitments under the Montreal Protocol”, said Mr. Ngatupuna Kae, Cook Islands Project Officer*

Participants further examined mechanisms for sustainable operation of the LRM. Discussions focused on analyzing costs and benefits of reuse of controlled substances through recycling, and reclamation and cost of destruction for controlled substances that could not be reused, considering factors like refrigerant type, application, potential quantity, and regulations. The workshop also explored using both regulations and incentives to encourage recovery and reuse of refrigerants. Implementing "reverse supply chains" to facilitate the return of recovered refrigerants was another key topic. Additionally, the workshop examined Extended Producer Responsibility (EPR) schemes, where producers are responsible for managing their products throughout their life cycle, including waste. Regional collaboration was seen as crucial for sharing best practices, lessons learned, and resources to enhance LRM programmes and overcome common challenges. This includes joint efforts in developing refrigerant inventories, adapting successful LRM models from other countries, and pooling resources for efficient implementation.

The workshop included a site visit to a cement kiln factory that can destroy ODS and HFC. This provided participants with insights into the destruction of unwanted controlled substances. Participants learned destruction technology, modification of the facility and operational experiences to meet requirement of the Montreal Protocol regarding approved destruction technology.

In conclusion, the workshop highlighted challenges and identified initial action plans to establish suitable mechanism that suits country context to ensure sustainable operation of recovery, recycling, reclamation, and destruction of controlled substances. By promoting responsible management of ODS and HFCs, the workshop supported the goals of the Montreal Protocol and its Kigali Amendment, contributing to the global effort to protect the ozone layer and mitigate climate change.

UNEP CAP team extends its sincere gratitude to the Government of the Philippines for their invaluable partnership in hosting this regional workshop. Their seamless coordination and generous hospitality have been instrumental in creating a productive and welcoming environment for all participants. The team also wishes to acknowledge the significant contributions of the esteemed resource persons and dedicated partners, whose expertise and commitment have greatly enriched the workshop proceedings.

This workshop is an integral part of the approved 2024 Work Programme under the Multilateral Fund, underscoring its significance in advancing the objectives of the Montreal Protocol.

**Contact:**

[Pipat Poopeerasupong](#), Interim Montreal Protocol Regional Coordinator, Southeast Asia, and Pacific Island Countries, UNEP-OzonAction CAP, Asia and Pacific Office

[UNEP, OzonAction, November 2024](#)

Image: OzonAction ROAP

## **8. UNEP Hosts Study Tour in Singapore to drive enhanced MEPS in Southeast Asia**



On November 5-6, UNEP-U4E, under the [ASEAN Cool Initiative](#), and UNEP OzonAction jointly led a Study Tour in Singapore, aimed at fostering knowledge exchange, sharing best practices, and enhancing understanding of regulatory frameworks for implementing and enforcing enhanced Minimum Energy Performance Standards (MEPS) across the region. The tour showcased Singapore's success meeting the Regional Phase II MEPS targets, offering a model for other ASEAN countries.

The Study Tour was co-organized by UNEP-U4E and UNEP OzonAction, in collaboration with the ASEAN Centre for Energy (ACE) and Singapore's National Environment Agency (NEA).

"By examining Singapore's achievements in implementing the regional Phase II MEPS target of 6.09 Cooling Seasonal Performance Factor (CSPF), participants gained practical insights into strategies policy interventions, enforcing MEPS, devising viable financial incentives and organizing effective stakeholder consultation", said Saikiran Kasamsetty, Energy Expert at U4E.

The ASEAN Cool Initiative, funded by the Clean Cooling Collaborative (CCC), was established to accelerate the ASEAN Regional Policy Roadmap for Energy-Efficient RACs.

### **Key Highlights of the Study Tour**

The Study Tour welcomed nearly 50 representatives from seven ASEAN member states (AMS) –Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Vietnam, along with Timor-Leste –as well as participants from the host country – Singapore, CCC and other key partners such as ACE, International

Institute for Energy Conservation (IIEC), and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Together, they explored policy solutions aimed at advancing regional energy efficiency goals.

### **Singapore's Regulatory Framework**

The Study Tour opened with NEA sharing its approach to energy efficiency through the Minimum Energy Labelling Scheme (MELS) and Minimum Energy Performance Standards (MEPS) in Singapore. NEA also highlighted Singapore's National Campaign through [Climate Friendly Housing Programme](#), which focuses on educating the public about sustainable energy practices and guiding them toward informed purchasing decisions by providing cash vouchers for purchasing high energy efficient appliances. The discussion on Hydrofluorocarbon (HFC) Regulation also attracted significant attention, as participants were keen to understand Singapore's policies for managing HFC emissions, a critical element in the broader fight against climate change.

Feedback from participants indicated that this session provided valuable insights into regulatory approaches that could serve as models for similar programs in their own countries. Many praised Singapore's well-structured regulatory framework and saw potential in adapting these strategies to fit the unique contexts of their respective national landscapes.

### **Market Analysis and Testing Infrastructure at the BCA Skylab**

A deep dive into the availability and performance of high-efficiency RAC models in Singapore was shared, specifically single-split systems, which are common across ASEAN countries. This analysis included pricing, performance, and trends in the market, underscoring the benefits and challenges of adopting similar high-efficiency models regionally. One key takeaway from the session was that higher efficiency does not necessarily equate to a higher price, dispelling the misconception that high-efficiency models are always more expensive.

A visit to the BCA Skylab was conducted which is a world-first high-rise, rotatable laboratory dedicated to testing building components and systems under a variety of real-world conditions. Participants were particularly interested in the laboratory's unique capabilities to simulate diverse climate conditions and assess energy performance. They were able to witness cutting-edge testing methodologies that examine aspects such as thermal conductivity and air infiltration, which directly impact building energy efficiency. Many attendees were inspired by Singapore's

commitment to innovative solutions and emphasized the importance of similar infrastructure in their own countries.

### **Regional Collaboration and Case Studies**

On the second day, each participating country shared updates on their respective MEPS implementation efforts, highlighting progress, challenges, and country-specific strategies to adopt the regional Phase II MEPS target. Common themes emerged, including the need for greater consumer education, increased testing capabilities, and support for policy harmonization within ASEAN.

The final day concluded with case study presentations by the Minister of Energy Transition and Water Transformation of Malaysia and the [SAVE 4.0 Program](#), which provides rebates to households for purchasing energy-efficient appliances, and Thailand shared its financial incentives aimed at making high-efficiency RACs more accessible. Participants responded positively to these case studies, and many countries expressed interest in exploring similar models to support their energy efficiency targets.

“The study tour provided invaluable, hands-on insights into how countries across the region are addressing the challenges of adopting the Phase II MEPS targets. We hope the dedicated sessions organized with Singapore’s NEA will motivate other countries to accelerate their progress toward these shared goals,” said Zafe Fazilah Abu Bakar, Project Coordinator at U4E.

The tour underscored the adaptability of strategies discussed, highlighting the importance of tailored solutions that meet each country’s specific needs. “This experience has reinforced the critical role of collaboration and knowledge exchange,” Zafe added, “as these interactions are essential to drive continuous innovation and improvement in energy efficiency.”

### **Key Takeaways and Recommendations**

#### **The tour emphasized:**

- **Harmonization of Standards and Regional Cooperation:** To create a more unified approach to advance the implementation of Phase II levels of MEPS per the ASEAN regional policy roadmap amongst the ASEAN member states (AMS) while facilitating trade and enhancing enforcement effectiveness.

Participants at the BCA Skylab

- **Consumer Education:** To educate consumers on energy labels, helping them prioritize long-term savings and environmental benefits over initial costs by providing clear guidelines to interpret labels and make informed choices through public campaigns.
- **Incentives for Adoption:** To encourage sustainable public procurement of energy-efficient RACs by offering exclusive fiscal incentives for relevant stakeholders, like manufacturers, retailers, and suppliers. For consumers, introduce trade-in rebates and on-bill financing to boost the uptake of high energy-efficient RACs.
- **Testing and Compliance:** Proficiency testing and capacity-building programs are used to enhance the testing infrastructure and skill set of personnel involved. Establish Mutual recognition agreements (MRAs) across accredited RAC testing laboratories to reduce trade barriers within the region.
- **Sustainable refrigerant transition:** To promote climate-friendly refrigerants to reduce carbon emissions while evaluating the energy performance of innovative technologies at BCA SkyLab to assess potential energy, environmental, and economic savings, especially in tropical climates.

**Contact:** [Saikiran Kasamsetty](#) or [Zafe Fazilah Abu Bakar](#)

[UNEP-U4E, 20 November 2024](#)

Image U4E

## 9. Guidance on Streamlining National ODS/HFC Licensing System in Asia and the Pacific

### Introduction

The guidance is designed to assist the governments of developing countries (“Article 5 countries” under the Montreal Protocol on Substances that Deplete the Ozone Layer) in devising strategies for digital solutions in electronic



import/export licensing systems to enhance monitoring, reporting, verification, and enforcement (MRVE) of licensing system of controlled substances under the Montreal Protocol.

The key functions of these systems include facilitating interactions and information sharing among licensing authorities, importers, exporters, and Customs.

The target audience is government officers responsible for operating licensing systems for substances controlled under the Montreal Protocol.

The guidance offers an overview of available options and recommendations for Ozone-Depleting Substances (ODS) and hydrofluorocarbon (HFC) import/export control processes and how to integrate them with other online systems used for national-level international trade.

Recommendations to overcome the challenges faced by Article 5 countries in implementing MRVE systems for ODS/HFC licensing systems are also elaborated. The recommendations are based on the actual experience from various developed and developing countries where import and export licensing systems are already integrated or interfaced with electronic platform such as National Single Window (NSW) system or Customs Automation Management (CAM) system.

[Read/ Download](#) the full publication >>>

[UN Environment Programme \(UNEP\), OzonAction, 27 November 2024](#)

Image: OzonAction

### **10. Keeping Cool: Empowering Technicians to Protect the Ozone Layer and Combat Climate Change in Indonesia**

In Indonesia, where tropical heat is a daily reality, air conditioning and refrigeration are essential—not just for comfort, but for supporting both economic and social well-being.



However, the growing demand for these services brings significant environmental challenges, particularly due to the use of ozone-depleting substances (ODS) and potent greenhouse gases as refrigerants. To address this, the United Nations



Development Programme (UNDP) works closely with the Government of Indonesia on implementing a comprehensive training program for refrigeration and air conditioning (RAC) technicians, as part of the country's broader efforts to transition away from harmful substances like hydrochlorofluorocarbons (HCFCs).

HCFCs were introduced as a replacement for chlorofluorocarbons (CFCs), which were once widely used in cooling systems but caused severe damage to the ozone layer. Although HCFCs are less harmful than CFCs, they still pose a significant threat to the ozone layer and contribute to global warming. Recognizing these risks, Indonesia has committed under the Montreal Protocol to completely phase out HCFCs by January 1, 2030.

### **Building a Skilled Workforce for a Sustainable Future**

A key component of Indonesia's strategy to achieve this goal is a comprehensive training program for refrigeration and air conditioning (RAC) technicians, who are vital in ensuring refrigerants are managed responsibly, preventing their venting into the atmosphere. The training equips technicians with essential skills in installation, repair, refrigerant leak prevention, and maintenance of cooling systems, ensuring they operate efficiently. It also emphasizes techniques to enhance efficiency, helping to reduce overall energy consumption. Additionally, technicians are introduced to low-global-warming-potential (low-GWP) refrigerants, learning both their properties and the safe handling practices needed for these newer, more environmentally friendly alternatives.

Over the past five years, Indonesia has certified 9,280 RAC technicians through this program supported not only by funding from HPMP Stage II but also by contributions from national/state budgets, along with industry resources. This certification improves their job prospects, credibility, and career growth. At the same time, industries benefit from a skilled workforce that enhances productivity and operational efficiency. [...]

### **A Vision for the Future**

Training technicians in the RAC sector goes beyond just protecting the environment—it's about empowering individuals and paving the way for a sustainable future. By cultivating a highly skilled workforce, Indonesia is not only cutting greenhouse gas emissions and protecting the ozone layer but also creating green job opportunities and driving economic growth. As the country embraces more climate-friendly refrigerants, these trained professionals will be at the

forefront of a transformative journey, leading the charge toward a greener, more resilient future.

[United Nations Development Programme \(UNDP\), 20 November 2024](#)

Image: UNDP

## 11. The EU's revised F-Gas rules: guidelines for the heat pump sector

Heat pumps currently use a wide range of fluorinated gases (F-gases) as refrigerants. The EU's revised F-Gas Regulation will require the industry to transition to alternative refrigerants with a lower Global Warming Potential (GWP) more rapidly, in line with the EU climate targets.



This paper provides a comprehensive overview of the revised rules on fluorinated gas (EU F-Gas Regulation) and their implications for the heat pump sector.

It covers key topics such as bans, HFC phase-down, overlap with REPowerEU, leakage control, market placement, export/import procedures, customs regulations, training and certification requirements and review clauses, aiming to clarify the regulatory landscape and its impact on stakeholders.

[European Heat Pump Association \(EHPA\), 22 November 2024](#)

Image: EHPA

**See also >>>** [The new European Commission: what's in it for the heat pump sector?](#)

It's official, the new European Commission was granted the votes necessary to start its mandate until 2029.

## 12. EU crackdown disrupts illegal HFC trade

**BELGIUM:** A six-month operation to disrupt the illegal trade in refrigerant gases has intercepted more than 400,000 tonnes of CO<sub>2</sub> equivalent material.



Operation Khione, which ran from May to October 2024, and was led by OLAF, the European Commission's anti-fraud office, is said to have prevented a total market loss of over €4.5m.

While no specific refrigerants are mentioned, 400,000 tonnes of CO<sub>2</sub>e is equivalent to around 200 tonnes of R410A or 280 tonnes of R134a.

Named after the Greek goddess of snow, the operation was carried out alongside customs authorities from 16 member states as well as Turkey and Ukraine, which are key in the transit of illegal refrigerant gas shipments to the EU. It focused on identification and monitoring of consignments of refrigerant gas for which the suspicion existed that the goods would be smuggled into the EU.

The operation included inspections of warehouses and distributions centres where the illicit refrigerant gases were often stored for resale on the black market.

"Illegal trade in refrigerant gases not only undermines the EU's green goals but also endangers public safety. Through this operation, OLAF and national customs services have shown that we can effectively disrupt this dangerous trade," said OLAF director-general Ville Itälä.

Currently, criminal and customs proceedings are being conducted in Poland, Italy, Romania, Slovakia, France and the Czech Republic regarding irregularities in gas trade.

The operation brought together customs authorities from Poland, Latvia, Germany, Slovakia, Hungary, Greece, Estonia, Lithuania, Spain, Italy, Belgium, Netherlands, France, Bulgaria, Croatia and Romania, Türkiye and Ukraine.

[CoolingPost, 21 November 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](#) and [Russian](#)**



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