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Global

1. Kigali Amendment latest ratifications

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

Guinea, 5 December 2019

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](#)



2. Countries commit to protect the ozone layer and climate under the Montreal Protocol

Delegates representing 171 parties to the Montreal Protocol concluded their 31st Meeting of the Parties in Rome, Italy, [8 November], agreeing to a number of key decisions, including actions to discover and prevent any illegal production or consumption of controlled, ozone-depleting substances, including CFC-11.

At the meeting, an update from the Scientific Assessment Panel (SAP) highlighted new preliminary data showing reductions in emissions of trichlorofluoromethane (CFC-11) in 2018 and 2019. The issue of unexpected emissions of CFC-11 was brought to the attention of the parties in 2018, revealing that global emissions of CFC-11 had increased in the period after 2012.

The parties also agreed on the terms of reference for a study to be carried out by the Technology and Economic Assessment Panel on the 2021-2023 replenishment of the Multilateral Fund for the Implementation of the Montreal Protocol.

In addition, the three Assessment Panels to the Montreal Protocol were requested to prepare quadrennial assessment reports – assessing the state of the ozone layer, the interactions between ozone and climate, the effects of changes in the ozone layer to human health and ecosystems, as well as alternative technologies to the controlled substances – to be submitted by the end of 2022 for consideration by the parties.

Other issues included the laboratory and analytical uses of ozone-depleting substances, with parties agreeing to extend the global exemption beyond 2021 with monitoring. Critical-use exemptions were granted to a few parties that requested to continue using small amounts of methyl bromide in agriculture.

Parties also memorialized that 88 parties have ratified the Kigali Amendment, which came into force on 1 January 2019. The Amendment is expected to avoid 0.4°C of future global warming by the end of the century by cutting hydrofluorocarbons (HFC) by more than 80 per cent over the next 30 years.

The synergies between the Montreal Protocol, the Kigali Amendment and Sustainable Development Goals (SDG) were further underlined by the high-level roundtable discussion on the contribution of the Montreal Protocol to the development of sustainable cold chains and the reduction of food loss. The same issue was underscored in the Rome Declaration. Signed by 76 parties to date, the Declaration recognizes the importance of the Protocol and its Kigali Amendment in raising awareness for developing sustainable and efficient solutions in the cold chain.

Speaking at the meeting, Inger Andersen, UNEP Executive Director, underscored the interconnectedness of environmental challenges, stating “nothing short of universal ratification of the Kigali Amendment is acceptable.”

In his opening statement at the high-level segment, the Italian Minister of the Environment, Land and Sea Protection, Sergio Costa, urged the parties to work together “to shoulder our responsibilities to ensure the protection of the environment for the future”, while Cardinal Pietro Parolin, on behalf of His Holiness, Pope



Francis, noted the Montreal Protocol was an example of how cooperation can “achieve important outcomes, which make it simultaneously possible to safeguard creation.”

The overarching themes of cooperation, mutual respect, consensus building in the pursuit of ozone protection, safeguarding the environment and the well-being of humanity were underscored by Tina Birmpili, Executive Secretary, Ozone Secretariat. Reiterating the importance of working together, the need to remain vigilant and to react swiftly to address issues such as the recent unexpected increase in CFC-11 emissions, she noted that collectively “we must turn our minds to what more we can do to address climate change and biodiversity and ecosystem loss – the biggest challenges humanity faces right now.”

[United Nations Environment Programme, 13 November 2019](#)

3. Saving the ozone layer in 1987 slowed global warming



The Montreal Protocol, an international agreement signed in 1987 to stop chlorofluorocarbons (CFCs) destroying the ozone layer, now appears to be the first international treaty to successfully slow the rate of global warming.

New research published in *Environmental Research Letters* has revealed that thanks to the Montreal Protocol, today’s global temperatures are considerably lower. And by mid-century the Earth will be – on average – at least 1°C cooler than it would have been without the agreement. Mitigation is even greater in regions such as the Arctic, where the avoided warming will be as much as 3°C – 4°C.

“By mass CFCs are thousands of times more potent a greenhouse gas compared to CO₂, so the Montreal Protocol not only saved the ozone layer but it also mitigated a substantial fraction of global warming,” said lead author of the paper Rishav Goyal.

“Remarkably, the Protocol has had a far greater impact on global warming than the Kyoto Agreement, which was specifically designed to reduce greenhouse gases. Action taken as part of the Kyoto Agreement will only reduce temperatures by 0.12°C by the middle of the century – compared to a full 1°C of mitigation from the Montreal Protocol.”

The findings were made inadvertently when the team set out to quantify how the Montreal Protocol had affected atmospheric circulation around Antarctica. To get their results, the researchers modelled global climate under two scenarios of atmospheric chemistry – one with, and one without the Montreal Protocol being enacted. They then extended these simulations into the future using conservative estimates for unmitigated CFC emissions – set to 3% growth per annum, much less than the observed CFC growth rates at the time of establishment of the Montreal Protocol. Their results therefore likely underestimate the actual impact of the international treaty to reduce CFCs.

The success of the Montreal Protocol in mitigating climate change is even more striking when focusing on regional domains. For example, warming of between 0.5°C – 1°C has already been avoided over North America, Africa and Eurasia. By mid-century avoided warming in some of these areas will be 1.5°C – 2°C and over the Arctic avoided warming will be as much as 3°C – 4°C.

The researchers also found an amount of avoided ice melt due to the Protocol, with the extent of sea ice around the Arctic during summer around 25% greater today than it would have been without any reduction in CFC emissions. The avoided warming over Greenland also suggests that the observed accelerating ice sheet melt there and the associated sea level rise has also been reduced by the Protocol.

“Without any fanfare the Montreal Protocol has been mitigating global warming impacts for more than three decades, surpassing some treaties that were specifically aimed to ameliorate climate change impacts,” said co-author Dr. Martin Jucker.

Looking ahead, co-author Prof Matthew England said, “The success of the Montreal Protocol demonstrates superbly that international treaties to limit greenhouse gas emissions really do work; they can impact our climate in very favourable ways, and they can help us avoid dangerous levels of climate change. “Montreal sorted out CFCs, the next big target has to be zeroing out our emissions of carbon dioxide.”

[The University of New South Wales, 9 December 2019](#)

Africa

4. South African government and industry working together to speed up HFC phase down



A recent two-day workshop in Cape Town, South Africa, brought together industry and government representatives, as well as other stakeholders to discuss opportunities to increase the uptake of low-GWP non-HFC technologies, energy efficiency in the cooling sector, and safety standards while phasing down HFCs under the Kigali Amendment to the Montreal Protocol.

Held from December 5-6, the event was organized by the United Nations Industrial Development Organization (UNIDO) together with the South African Department of Environment, Forestry and Fisheries (DEFF).

Since South Africa ratified the Kigali Amendment in August 2019, its collaboration with UNIDO has been strong, facilitating a smooth transition towards implementation in the country. The DEFF expressed its interest in supporting the local HVAC&R industry in speeding up the HFC phase down.

In his opening remarks, Yury Sorokin, Industrial Development Officer, UNIDO emphasized the importance of working together to achieve common goals. "If the Government works together with industry, as has been the case in South Africa, we will see better results in the implementation of the Kigali Amendment," he said. Mark Gordon, Deputy Director General, Chemicals and Waste, DEFF noted that with "the increasing devastating impacts of climate change, including unprecedented increases in temperature and adverse weather, combined with our efforts to enhance ozone protection of the earth, the industry will have to phase out high-GWP HFCs and seek out more climate- and ozone-friendly alternatives."

The first day of the workshop examined the experience of countries that successfully phased down HFCs and included possible ways to improve efficiency for the local HVAC&R industry while exploring standards and market transformations. It also included a natural refrigerant panel discussion, looking at the potential of these gases for the South African market.

It was a very interactive workshop with great participation from government and industry alike, all with a common goal of trying to "leapfrog" from HCFCs over HFCs as the government has expressed on many occasions. South Africa is still at the very beginning of its HFC phase-down journey and on the day before the conference, a stakeholder meeting was held to discuss the progress in meeting targets for the HCFC phase out.

As an Article 5 (developing) Group 1 country, South Africa has baseline years ranging from 2020 to 2022; it freezes use at that level in 2024 to start its phase-down plan per the Kigali Amendment. As the country solely imports refrigerants (some of which it exports again to neighboring countries), stakeholders have been working together for the past few years to update import tariff codes to list HFCs individually. This will assist in being able to monitor which HFCs are being imported and exported.

Government urged industry to assist it with the looming phase down as meet the requirements of the Kigali Amendment. "We do not currently have adequate rules in place," explained Margaret Molefe, Director: Hazardous Chemicals Management of DEFF. "We need to understand how we should meet these obligations so we can comply with them."

Natasha Kochova, Consultant with the Montreal Protocol Division, Department of the Environment, UNIDO shared an overview of energy efficiency in the context of international agreements. She looked at the big picture, sharing the various decisions of the Montreal Protocol's Open-Ended Working Group (OEWG) and Meeting of the Parties (MOP) events over the past few years. Her presentation particularly looked at the impact of refrigeration on the climate and shared a slide that showed how changing to low-GWP alternative refrigerants can have an even bigger impact on the environment than turning vegetarian.

Day one of the workshop was followed by a site visit to the newly opened upmarket Woolworths food retail store not far from the conference venue. The V&A Waterfront store boasts an impressive transcritical CO₂ rack built by Mainstream Refrigeration in Cape Town. During the natural refrigerants panel discussion, Alex Kuzma, Head of Engineering at Woolworths had said that the company will exclusively be installing transcritical CO₂ refrigeration systems for all its large stores. Even in its smaller stores, he added, CO₂ is becoming more popular.

Don't fear change

On day two of the workshop, discussions were held on policies and activities assisting the HFC phase-down process, including best available technologies, and options for unlocking the benefits of non-HFC technologies.

The program included various presentations on training of technicians and refrigerant licensing, as well as standards currently being developed for the sector, showing industry's progress in moving away from HFCs. Stuart Fleming, Group CEO of Enviroserve, a refrigerant recycling facility in the UAE encouraged industry to make a drastic change and give end users no choice but to be sustainable. "Don't be afraid of radical change in global sustainability – we're at a time where we have to now," he said.

John Ackermann, Chairman of the South African Refrigeration Distribution Association (SARDA) and founder of the Cold Link newspaper, gave a very moving presentation about the history of natural refrigerants in South Africa, urging industry and government to think in a different way. "The only long-term solution is natural refrigerants; whether we like it or not," said Ackermann. "There are challenges, but if we can go to the moon, we can overcome those minor details."

Ackermann shared examples of natural refrigeration systems that have been working in the country for many decades. "There is enough proof that these systems work," he said. Looking at the way forward, he suggested comprehensive skills training, safety awareness campaigns, compliance with existing standards and regulations; he called on government to lead by example by putting natural refrigerants in its own buildings. "Everyone has a role to play," Ackermann concluded. "The ball is in your court to extend the quality of life on our planet."

The well-attended event was hailed a success by both UNIDO and DEFF, the former commented on numerous occasions how rare it is to see industry and government working together this well on the HFC phase down. Throughout the event, various speakers and stakeholders referred to the people in the room as a "family," all fighting for a common goal.

Natural refrigerants in 2020

The conversation continues next year on March 10, 2020 when the first ATMOSphere Cape Town event takes place at the Vineyard Hotel to discuss the future potential of natural refrigerants in South Africa. The event will bring together industry, government, and end users to talk about the way forward. Registrations are now open. [Find out more](#)

r744, 12 December 2019, By: Ilana Koegelenberg

5. Gambia National Environment Agency Executive Director challenges refrigeration technicians to redouble efforts against ozone depletion

Executive Director of the National Environment Agency (NEA) has called on refrigeration technicians within Central River Region to be committed and redouble their efforts against the rapid depletion of the ozone layer as the refrigeration and air conditioning subsector is experiencing a lot of transformation in terms of technology and the introduction of new refrigerants in a bid to replace the ones that are not only Ozone Depleting Substances (ODS) but are potent greenhouse gases that contribute to the warming of the earth.

Dodou Trawally revealed that tools and equipment that technicians use is to recover refrigeration that do not only deplete the Ozone layer but contribute to the warming of the earth that can result to dire consequences like the melting of polar ice and subsequent flooding of our homes and agricultural land. He told participants that at the end of the training, they would be introduced and exposed to alternatives like Hydrocarbon 290 for air conditioning systems and natural refrigerants like CO₂, water, etc. as oppose to those refrigerants that contribute to the warming of the earth.

NEA boss made this disclosure during the official opening ceremony of a four day training workshop for refrigeration and air conditioning technicians within Central River Region on the use of tools and equipment, new innovations in the refrigeration and air conditioning subsector, and safety use of flammable refrigeration held at the Governor's office in Janjanbureh.

"The challenge we now face is the lack of alternatives and as technicians you should encourage the importers of refrigerants to start importing the alternatives to Hydrochloroflourocarbons (HCFCs) so that the Gambia can meet the 2030 phase-out target." Dodou pointed out, reiterating that we have to face the challenges together and



NEA Executive Director challenges refrigeration technicians to redouble efforts against ozone depletion

Africa • Gambia • 12 DEC 2019



Thursday, December 5, 2019
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Calling on the public in general and technicians in particular to play positive role, Dodou Trawally further disclosed that "All of us have a role to play in reducing the production and consumption of such refrigerants that are threatening our survival and our very existence on earth. As technicians and major stakeholders in the servicing sector, you should encourage end-users to convert to Ozone friendly refrigerants which is now available in our markets and can be used in our air conditioning systems. Importers also need to support us by importing such alternatives to gradually phase out the old refrigerants."

As Article five (Paris) council, he said it is important to note that we have to adjust to the compliance requirements of the international agreements like the Vienna and the Montreal protocol on substances that deplete the Ozone Layer, and we have to be committed in ensuring that new technologies are adopted for a cleaner environment. This, he said is a challenge of us all. We have to face, but with some political support from Government and other partners like the United Nations Environment Programme (UNEP), United Nations Industrial Development Organisation (UNIDO) and Social Environment Facility (SEF), we are assured of compliance.

In his welcoming remarks, the Deputy Governor of CRR Omar Say, buttressed that this training is timely as environmental issues are coming on top of the global agenda. Describing technicians as the premier stakeholders in the front line in the fight against Ozone Depleting Substances, Deputy Governor revealed that refrigerants that contribute to the warming of the earth or a potential contributor to greenhouse gas should not be used by the technicians. This is more of a reason why he needs to build your capacities in alternative technologies and innovations in the refrigeration and air conditioning industry.

He further thanked the NEA for bringing an answer to such a laudable training needs to his Region of Janjanbureh and the Governor Abba Sanjary expressed: "Some of you have already attended similar training programmes but you still need to know that new technologies are emerging and alternative refrigerants are also being introduced and tested in our markets. Your customers including us would count on you on the safety use of such refrigerants as some of them are highly flammable".

He jugged.
Author: Sheikh Abukiky Sanjary

holistically for the fact that the cost involve in converting to ozone friendly refrigerants cannot be carried out by the government alone but by all relevant stakeholders.

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[The Point - Gambia, 5 December 2019, By: Sheikh Alkinky Sanyang](#)

Asia Pacific

6. Where does waste go on a small island?

[...] Samoa is facing a problem that plagues small islands states—**where does all the waste go?**

“Here in Samoa and other islands as well there’s no recycling that goes on. Pretty much we collect and process it for export to countries overseas,” Keil says. “But it’s hard for us to export because of the operational and the freight cost.”

It is precisely this obstacle that a new partnership called Moana Taka is designed to tackle. The partnership between the Secretariat of the Pacific Regional Environment Programme and China Navigation Company, part of the Swire Group, provides a way to offload recyclable waste from Samoa and other Pacific countries to recycling facilities abroad. The UN Environment Programme (UNEP) helped facilitate the agreement.

“It’s an exciting public-private partnership,” says Sefanaia Nawadra, the Head of UNEP’s Pacific Office. “Pacific island countries that cannot store or treat waste properly and are unable to afford to ship recyclable waste can use Swire vessels to transport it to ports where these facilities exist—for free. It’s a great example of cooperation between governments, civil society and the private sector.”

Waste such as plastics, aluminum cans, oil and ozone depleting substances are all eligible for transport under the partnership.



There are 21 countries and territories participating: American Samoa, Cook Islands, Commonwealth of Northern Mariana Islands, Guam, Fiji, French Polynesia, Kiribati, Republic of the Marshall Islands, Federated States of Micronesia, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu, Vanuatu and Wallis and Futuna.

So far, Pacific island nations have been able to send over 100 tonnes of waste to be recycled through the [Moana Taka partnership](#). [...]

United Nations Environment Programme, November 2019

7. Transforming Thailand's Cooling Sector with NatRefs

The RAC NAMA project is moving the country towards energy-efficient refrigeration and air-conditioning products by using natural refrigerants like propane – and establishing a model for developing countries.

Thailand's climate is hot, and energy demand from the refrigeration and air conditioning (RAC) sector is rising fast.

Energy demand for household cooling in Thailand is projected to grow from around 1,000kWh per household in 2015 to 2,500kWh per household in 2030.

There's also the rising number of refrigeration systems needed in the country's growing cold chain of convenience stores, supermarkets, refrigerated transport, cold storage warehouses, and food manufacturing facilities.

All of this contributes to Thailand's greenhouse-gas (GHG) emissions, which, under the Paris Agreement, the country is committed to reducing by 20%, as compared to business as usual (BAU) by 2030. A BAU scenario would elevate Thailand's GHG emissions to 555Mt (million metric tons) of CO₂e by 2030, which means the country needs to cut emissions by 111Mt of CO₂e before then, noted Dr. Kittisak Prukkanone, Director of the Measure and Mechanism Development Section of Thailand's Ministry of Natural Resources and Environment.

To address its growing cooling needs while also helping to meet its emissions goals, Thailand's five-year Refrigeration and Air Conditioning Nationally Appropriate Mitigation Action (RAC NAMA) project was created in 2016. Its basic goal is to transition the country's RAC industry – one of the world's largest manufacturing hubs and exporters of RAC equipment – to the production of energy-efficient products that use natural refrigerants, notably propane (R290).

The RAC NAMA project, with European partners and funding of 320 million Baht (US\$10.6 million), affords Thailand an opportunity to kickstart a completely natural refrigerant-fueled path for sustainable growth in the next decade. The RAC NAMA project's influence may well extend to the entire Association of Southeast Asian Nations (ASEAN) region and beyond, setting a precedent on how international cooperation can be used to accelerate a developing country's transition towards sustainability in the RAC sector. (*Another Southeast Asia project with similar aims is being managed by UNIDO in the Philippines; see page 78.*)

R290 conversions

The RAC NAMA Fund's 320 million Baht (US\$10.6 million) in funding is targeted at three main stakeholder groups: local manufacturers, residential consumers, and small- to medium-sized commercial end users, as well as training and testing facilities. Since the establishment of the fund in 2017, local Thai manufacturers have already shown interest, and production line conversions to R290 have begun taking place.

Two examples are Thailand's Sanden Intercool Group ([see "Pushing Natural Refrigerants in Southeast Asia," Accelerate Magazine, September 2019](#)) and [The Cool](#) (page 76), which are two of the country's largest manufacturers of commercial refrigeration equipment. Several additional agreements are ongoing and others will take place in the next few months, according to GIZ, the project's implementer.

Most recently, on October 1, GIZ and Thai manufacturer Saijo Denki signed a Memorandum of Understanding (MoU). The MoU cemented collaboration in "the transfer of knowledge and the procurement of state-of-the-art equipment necessary for the manufacture of natural refrigerant-based technologies, which include air-to-water heat pump, chiller and monobloc air conditioner," according to a [GIZ press release](#). "The MoU formalizes two years of ongoing cooperation and is part of Saijo Denki's internationalization and innovation strategy."

[Accelerate, November-December 2019](#)



8. Fisheries Commission must consider climate change impact

The Fiji Fisheries Agency (FFA) says Pacific nations want the regional tuna commission to fully recognize the impacts of climate change on fisheries.

FFA Director-General, Manu Tupou-Roosen said members are calling for stronger action by the commission to recognize the impacts on fisheries, food security, and livelihoods.

She said measures could include vessels assessing their use of the ozone-depleting substances that are used in refrigeration.

Meanwhile, Fiji aims to phase out these ozone-depleting technologies through the launch of the new Retrofit and Demonstration Project for the Fishing Industry.

As part of the project, one of Solander Pacific's vessels will be retrofitted and used as a demonstration for other fishing vessel operators.

Dr. Tupou-Roosen also highlighted that there is a lot of work to be done but what is done in the next few years will be critical when it comes to the challenge of tackling climate change.

FBC News, 9 December 2019, By: Lena Reece



TOP PHOTO COURTESY OF THE FISHING INDUSTRY FOR THE LATEST MEETING OF THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

West Asia

9. Select repair shops must obtain license to operate in Oman

Repair shops for refrigeration equipment, air conditioners and other equipment should secure a license in the sultanate.

Repair shops for refrigeration equipment, air conditioners and other equipment that impact the ozone layer, must gain a license from the Ministry of Environment and Climate Affairs (MECA) to operate in the sultanate, Times of Oman reported.

The license fees begins from OMR20 [46 Euro] for small companies to OMR50 [117 Euro] for larger ones.

The decision prohibited establishments from using adulterated or substandard materials, and advised them to ensure quality of materials used in repair and maintenance works, the report said.

Non-compliance would result in a fine of OMR200 [468 Euro].

The establishments are forbidden to use recycled materials in the repair and maintenance process unless the material bears high quality, and is free from impurities and contaminants. Furthermore, the material must comply with technical standards, the report said.

Gulf Business, 1 December 2019, By: Zainab Mansoor



Europe & Central Asia

10. Commission publishes the results of the Ozone Evaluation

The European Commission has published the results of its evaluation of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer (the Ozone Regulation).

The Regulation plays a major role in the global effort to ensure the recovery of the stratospheric ozone layer as well as reducing global warming, since ozone-depleting substances are also powerful greenhouse gases.

The evaluation started in 2017 and included several consultation activities, including a public consultation in line with the Commissions' Better Regulation guidelines.

The Commission found that the Regulation has achieved its objectives: ensuring compliance with international agreements such as the Montreal Protocol, and guaranteeing a high level of ambition for protecting the ozone layer and fighting climate change.

The Regulation has clear EU added value, since only a common, harmonized EU approach can address this problem. The evaluation showed that the Regulation is generally well aligned with relevant EU and international legislation. The Commission also found that the Regulation is efficient, but some results might be achievable through simpler, less resource intensive activities.

Based on the outcomes of the evaluation, the Commission is starting an impact assessment to examine if and how it can further improve the Regulation in the coming years.

[The European Commission, 3 December 2019](#)



See also >>> [Euro Green Deal "a golden opportunity" for cooling](#)

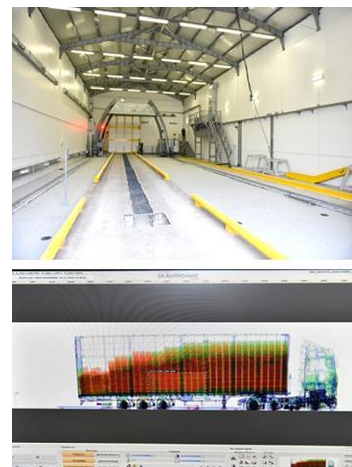
11. Kyrgyzstan strengthens border controls using X-ray equipment

Torugart, Kyrgyzstan, 11 December 2019 - The first X-ray equipment for trucks has been installed at the Torugart checkpoint in the Naryn province of Kyrgyzstan which is connected through the Torugart mountain pass with the Xinjiang region of China. It is one of the highest mountain roads of the country at an elevation of 3,752 meter above sea level and located in the Tian Shan mountains. The trade volume between China and Kyrgyzstan is estimated to be at least USD 2 billion per year. Torugart and Erkeshtam are the main customs checkpoints for shipments from China to most other Central Asian countries. This new equipment will allow the automated monitoring of the shipment of goods in real time and help to combat illegal trade.

Prime Minister Mukhammedkaliy Abylgaziev stated that border checkpoints are not only important for Kyrgyzstan's economy, but also for those of the other members of the Eurasian Economic Union (EEU). Equipping the checkpoints at the outside borders of the EEU with modern equipment was included in the roadmap when joining the EEU. In total, six checkpoints will be equipped with similar technology with assistance by the Russian Federation.

The new equipment will also allow the better monitoring of imports of ozone-depleting substances, hydrofluorocarbons (HFCs) controlled by the Montreal Protocol and its Kigali Amendment. This also applies to equipment containing these chemicals as refrigerants such as refrigerators, freezers and air-conditioners.

Contact: [Mars Amanaliev](#), Ozone Center of Kyrgyzstan, State Agency of Environment Protection and Forestry



12. Halon replacement in the aviation industry

[...] The Montreal Protocol and its subsequent amendments are designed to reduce emissions of some 90 ODSs by phasing out their production and consumption. Subsequent action has produced clear evidence of a decrease in the atmospheric burden of ODSs and some early signs of stratospheric ozone recovery have been observed.

However, despite drastic (98%) reductions in global consumption of ODSs, the ozone layer is not projected to recover pre-1980 concentration levels before the middle of this century.

Increased UV-B radiation resulting from ozone depletion persists as a significant threat to health and the environment. At the same time, most ODSs have very high global warming potential and are significant factors in raising the temperature of the planet.

Therefore, we need to take further effective measures to protect human health and the environment against adverse effects resulting from ODS emissions and avoid the risk of delaying the recovery of the ozone layer yet further. The production and use of ODSs must be minimised and eliminated wherever technically and economically feasible alternatives with low global warming potential are available.

While many ODSs are greenhouse gases, they are not controlled under the United Nations Framework Convention for Climate Change and its Kyoto Protocol, on the assumption that they will be phased-out under the Montreal Protocol. Despite the progress made under the Montreal Protocol, the phasing-out still needs to be completed in the EU and globally, although we have to bear in mind that many current alternatives also have high global warming potential.

The EU needs to take action to comply with its obligations under the Montreal Protocol. Since the 1980s, it has adopted a series of Ozone Regulations that have eliminated the most relevant ODSs and established it as a world leader on ozone policy.

The main objectives of the current Ozone Regulation (Regulation (EC) No 1005/2009)¹ are to:

- Ensure that the EU is compliant with the agreements that the international community has put in place to protect the ozone layer; and
- Have a high level of ambition for protecting the ozone layer and fighting climate change.

Halon 1211, halon 1301 and halon 2402 are ODSs listed as controlled substances in the Ozone Regulation (Group III in Annex I). Their production in EU Member States has been banned since 1994, as required under the Montreal Protocol, but they may be placed on the EU market and used for 'critical uses', including some uses on aircraft (see section 2). In the light of the increased availability and implementation of alternatives, 'cut-off dates' and 'end dates' have been established for phasing-out these halons, after which their use will not be considered 'critical' and will no longer be permitted.

Purpose of this guide

The primary purpose of this guide is to clarify how the Ozone Regulation applies to aeronautical products.

In addition, it gives an overview of the rules applicable to the use of halons in the aviation industry. [...]

This guide has been jointly developed by the European Commission and EASA to support aviation industry with complying with the requirements of Regulation (EC) No 1005/2009 (the Ozone Regulation) on halon replacement.

It is mainly for the attention of applicants for type certificate, to help them to determine when their proposed new design needs to comply with the Ozone Regulation.

The document provides in particular clarifications on the interpretation of the cut-off dates applicability, as well as information on the derogation process.

[The European Commission and The European Union Aviation Safety Agency, November 2019](#)



13. Count on Cooling: A five-step approach to deliver sustainable cooling

Executive Summary

This White Paper examines the crucial role of cooling in the 21st Century. Cooling includes comfort cooling for people (in their homes, offices, shopping centers, etc.) as well as cooling of products (production, transport and storage of food, medicines, leisure applications such as ice rinks, etc.).

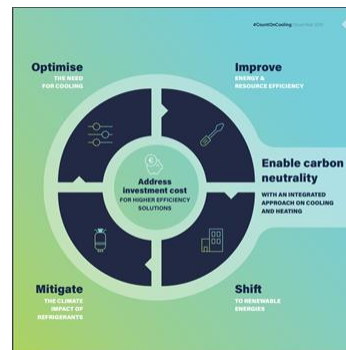
There is expected to be massive growth in the use of cooling carried out throughout the world, especially in developing countries. This growth will deliver substantial benefits in many respects including human health and productivity and it will contribute towards reduction of food loss and better supply of heat sensitive medicines. A number of these benefits align closely with the UN's Sustainable Development Goals.

However, growth in the use of cooling could also lead to increased energy consumption associated with greenhouse gas emissions and place significant burdens of peak demand on electricity generation systems. These negative impacts can be addressed through the implementation of sustainable cooling – maximising the benefits of cooling whilst creating the smallest possible footprint in terms of greenhouse gas emissions and electrical peak demand.

This paper describes important steps that can be undertaken to deliver sustainable cooling, including examples of how the EU policy framework has already taken steps forward and an analysis of the remaining challenges.

A 5-step approach is proposed to (1) optimise the need for cooling, (2) improve the energy and resource efficiency of cooling equipment, (3) mitigate the climate impact of refrigerants, (4) address the investment cost for higher efficiency solutions, (5) shift to renewable energy sources with an integrated approach to cooling and heating of individual buildings or whole cities.

[EPEE - European Partnership for Energy and the Environment, December 2019](#)



14. La Guardia Civil investiga a 68 personas y 30 empresas por emisiones de gases de efecto invernadero (España)

- Las empresas investigadas habrían emitido más de 76 millones de kg de CO₂ a la atmósfera al no gestionar de manera correcta estos gases en los vehículos al final de su vida útil

- La liberación del gas R134A está prohibida por la UE debido a su alto potencial de calentamiento global

- La operación ha sido realizada a instancias de la Fiscalía de Medioambiente y se ha desarrollado en Madrid, Cataluña y el País Vasco

La Guardia Civil, en el marco de la Operación KIGALI, ha investigado a 68 personas vinculadas con 30 empresas en todo el territorio nacional por la emisión a la atmósfera de gas refrigerante en la inadecuada gestión de vehículos al final de su vida útil. La investigación, en el contexto de las actuaciones de la Fiscalía Coordinadora de Medio Ambiente y Urbanismo, se ha centrado en las Comunidades de Madrid, Cataluña y País Vasco cuyas Autoridades han aportado los datos de que disponían.

Monitorización de los Centros de Tratamiento de Vehículos

Los sistemas de aire acondicionado de los vehículos a motor emplean fluidos refrigerantes para reducir la temperatura del habitáculo interior. Estas sustancias, en función de su tipología y composición, pueden ser perjudiciales y contribuir al calentamiento climático.

La investigación se ha centrado en la monitorización de la actividad de Centros de Tratamiento de Vehículos al final de su vida útil que en sus memorias habían declarado cantidades próximas a cero kilogramos de gas R 134A recuperado y ha detectado emisiones equivalentes a más de 76 millones de kilogramos de CO₂ a la atmósfera, lo que supone una emisión estimada de 800 millones de kilómetros recorridos por un vehículo.

Técnicos de la Fiscalía de Medio Ambiente y Urbanismo cuantificarán el daño al medio ambiente producido por la emisión.



El efecto invernadero y el cambio climático

Los principales gases empleados históricamente para la refrigeración en automoción se pueden clasificar en los siguientes grupos: Gases CFCs, HFCs (entre los que se encuentra el R 134A) y HFO.

Al finalizar la vida útil de los vehículos equipados con sistemas de aire acondicionado que emplean estos gases, los fluidos refrigerantes contenidos en el interior de sus circuitos deben de ser recuperados y gestionados correctamente, según la legislación. Para ello el titular del vehículo está obligado a entregar su automóvil a un gestor autorizado y obtener documentación que acredite que la gestión de los residuos se efectuará de forma adecuada.

Los vehículos al final de su vida útil, contienen una cantidad importante de contaminantes y residuos peligrosos que se han de gestionar adecuadamente. En el caso de los fluidos de los circuitos refrigerantes, su incorrecta gestión conllevaría la emisión a la atmósfera de gases de efecto invernadero.

La operación ha sido desarrollada por agentes del Servicio de Protección de la Naturaleza de la Guardia Civil (Seprona), con el apoyo de EUROPOL en el análisis de las comunicaciones y con el análisis estratégico de documentación para hallar posibles relaciones con el resto de países europeos, así como con la colaboración de las Comunidades Autónomas de Madrid, País Vasco y Cataluña, quienes han facilitado datos en relación a la documentación de las empresas investigadas.

Para más información pueden contactar con la Oficina de Prensa de la Jefatura del Servicio de Protección de la Naturaleza teléfono 91 5146900.

[La Guardia Civil - España, 7 Diciembre 2019](#)

5th Edition of Europe and Central Asia (ECA) Montreal Protocol Award for Customs and Enforcement Officers for 2019-2020

The United Nations Environment Programme OzonAction, in cooperation with the World Customs Organization and the Ozone Secretariat, has launched the fifth edition of the ECA Montreal Protocol Award for Customs and Enforcement Officers for the period 2019-2020. Nominations forms are available in English and Russian and the award ceremony is scheduled for 2021. The award is part of the work programme of OzonAction's Regional Montreal Protocol Network for Europe and Central Asia (ECA network).



The award recognizes the crucial role of customs & enforcement officers in implementing trade restrictions and bans for hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs). Both groups of chemicals, which are controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer, are widely used as refrigerants and foam blowing agents in the refrigeration, air conditioning and foam blowing sectors.

The informal Prior Informed Consent (iPIC) system allows trade partners to confirm the legitimacy of an intended trade in controlled substances prior to issuing import / export licenses. More information on iPIC is available [here](#)

The award aims to recognize and offer encouragement to customs and enforcement officers and their respective organizations for successful prevention of illegal or unwanted trade in HCFCs / HFCs. This also includes equipment or products containing or relying on the use of HCFCs / HFCs.

Eligible nominees include customs and enforcement officers and / or their respective organizations who have been directly involved or instrumental in preventing illegal or unwanted trade in HCFCs / HFCs as well as equipment or products containing or relying on the use of HCFCs / HFCs.

Eligible enforcement actions include the detection of an illegal shipment and the subsequent seizure, detention or sending back of the disallowed goods, as well as successful iPIC consultation preventing the issuance of export / import licenses for illegal or unwanted shipments.

Enforcement actions are eligible if they have not been submitted to any other award schemes.

Geographical scope and time period

Eligible countries include those in the Europe and Central Asia (ECA) region including countries with economies in transition (CEIT countries) and Western European countries as well as their trading partners.

**Eligible enforcement actions must have taken place during the period:
1 January 2019 – 31 December 2020.**

Completed nomination forms with detailed and comprehensive case descriptions and supporting photos and documents should be received by the United Nations Environment Programme as soon as possible but **at the latest by: 31 January 2021.**

Latin America and Caribbean

15. “Formación a Formadores” nacionales en Costa Rica y El Salvador



Dos “Formación a Formadores” nacionales y regionales para un total de 32 entrenadores y técnicos RAC de Costa Rica y El Salvador sobre el uso seguro de hidrocarburos.

Del 9 al 20 de diciembre 2019 los proyectos C4 (BMU), SPODS (BMZ/UE), 4E (BMZ) de la Cooperación Alemana al Desarrollo (GIZ), en cooperación con la Dirección de Gestión de Calidad Ambiental (DIGECA) del Ministerio de Ambiente y Energía (MINAE) de Costa Rica, y en cooperación con PNUD y la Fundación Samuel organizan dos capacitaciones de Formación a Formadores (en inglés “Training of the Trainers”, en breve: ToT).

Treinta y dos técnicos en refrigeración y climatización fueron beneficiados con dos cursos (2) capacitaciones de una semana de duración en refrigeración y climatización, sobre el uso seguro de hidrocarburos (refrigeración con R600a y R290 split A/A) en el Fundación Samuel en Costa Rica. La formación incluyó sesiones teóricas y prácticas sobre el uso seguro de los hidrocarburos, incluidas las competencias de soldadura.

La capacitación forma parte de una serie de viajes de estudio y actividades de entrenamiento. Un total de 4 capacitaciones ToT ya han sido realizados en Costa Rica entre 2018 y 2019 (en total 64 entrenadores y técnicos de 10 países han sido capacitados). En 2020, se planea llevar a cabo dos (2) entrenamientos adicionales para otros 32 entrenadores y técnicos del país. Además, cuatro institutos de formación técnica en Costa Rica han sido equipados con Aires Acondicionados tipo split con refrigerante R290 y refrigeradores con refrigerante R600a, así como con herramientas y equipos.

Los entrenadores que participen serán capaces de entrenar a otros entrenadores o estudiantes en refrigeración con R600a y en A/A Split con R290. Para los entrenamientos y para los proyectos de demostración se han importado 100 unidades R290 A/A en Costa Rica.

Contact: [Julia Schabel](#), Proklima GIZ

16. Trabajadores del Minec reciben formación sobre sustancias agotadoras de la capa de ozono en Cojedes (Venezuela)



Con el objetivo de preservar la vida en el planeta, la División Ecosocialista de Manejo de Desechos y Residuos de la Unidad Territorial para el Ecosocialismo (UTEC) en el estado Cojedes del Ministerio del Poder Popular para el Ecosocialismo (Minec), realizaron un taller formativo sobre las Sustancias Agotadoras de la Capa de Ozono (SAO), dirigido al personal de la institución.

Durante la inducción, se discutieron temas relacionados con la emisión y reducción de las SAO, que se producen mediante gases refrigerantes como los Hidrofluorocarbonos (HFC) y los Clorofluorocarbonos (CFC), elementos químicos utilizados constantemente en los procesos industriales y domésticos.

Esta formación tuvo como objetivo que los técnicos de la UTEC detecten a tiempo los posibles daños que se puedan ocasionar a la madre tierra, al momento de realizar las inspecciones a las industrias.

La atmósfera tiene distintas capas, cuya composición de gases varía según la altitud. Una de estas capas es la de ozono, con la primordial función de proteger a la tierra de la radiación ultravioleta. Los principales agentes de destrucción del ozono estratosférico son mayormente el cloro y el bromo libres, que reaccionan negativamente con ese gas.

De esta manera, el Minec avanza en la protección de la madre tierra, en cumplimiento del Quinto Objetivo Histórico del Plan de la Patria 2019-2025 , además de honrar los convenios internacionales que rigen la materia. Así SOMOS, 10 de diciembre de 2019

North America

17. The world solved the ozone problem. It can solve climate change

Nearly 50 years ago, three chemists named Mario Molina, Sherwood Rowland and Paul Crutzen found evidence that chlorofluorocarbons, chemicals known as CFCs and released from aerosol sprays, were weakening the ozone layer that functions as the earth's natural sunscreen protecting humans, animals and plants from harmful radiation.

The discovery made big news and rattled the public. Aerosol sales dropped dramatically, and, despite pushback from the chemical companies that made CFCs, Congress in 1977 added protecting the ozone layer to the Environmental Protection Agency's duties under the Clean Air Act. Not long afterward, the agency determined that the compounds, then widely used in refrigerators, air-conditioners and some industrial processes, posed an even graver threat to the atmosphere than first thought. Soon after, pressure began to build for a phaseout of CFCs in the United States as well as for an international treaty to find alternatives.

The case for global action became ever more urgent in 1985 when a British team discovered a hole in the ozone layer above Antarctica, followed by confirmation by NASA scientists of a connection between the hole and CFCs. With the rest of the world and even industry on board, the result was the 1987 Montreal Protocol, a landmark agreement banning chlorofluorocarbons and other ozone-depleting chemicals. End of story? Not quite. As it happened, the ozone-friendly replacements for the CFCs, known as hydrofluorocarbons, turned out to be distinctly unfriendly to the climate. So in 2016, the Montreal signatories reconvened in Kigali, Rwanda, and agreed to amend the original protocol to phase out HFCs and find substitutes more friendly to the atmosphere.

The bottom line is that the world, confronted with two dire threats to the earth's fragile atmosphere, found two planetary responses with positive outcomes. The ozone layer is healing. That's worth remembering as we struggle, often despairingly, to find common ground in the battle against climate change. Compared with the manifold complexities of global warming, dealing with ozone depletion was, in fact, relatively simple. But the key point is that it happened, and it's worth asking why the world has not responded with similar resolve in dealing with the main global warming gases like carbon dioxide, about which we have known a lot for a long time.

In 1965, following a report from his Science Advisory Committee, President Lyndon Johnson asked Congress to pass a law curbing carbon dioxide emissions. Four years later, in a memo to John Ehrlichman, President Nixon's domestic affairs chief, Daniel Patrick Moynihan, then a presidential assistant, warned that "man has begun to introduce instability" in the atmosphere "through the burning of fossil fuels." Atmospheric warming, Mr. Moynihan said, "very clearly is a problem, and perhaps most particularly, is one that can seize the imagination of persons normally indifferent to projects of apocalyptic change." Indeed, he offered, it was not out of the question to imagine "mammoth man-made efforts to countervail the CO2 rise (e.g., stop burning fossil fuels)."

Later came the dramatic congressional testimony of James Hansen, a NASA scientist, before Congress in June 1988, linking global warming to human activities with 99 percent certainty, an assertion that landed the issue on the front page of The New York Times; also the strenuous efforts of advocates like Al Gore to demonstrate the link between warming and the increase in manufacturing and the use of fossil fuels since the beginning of the Industrial Revolution.

Yet scientific knowledge has not produced action equal to the challenge. One reason has been the absence, until fairly recently, of obvious environmental damage threatening individual well-being and the sense of urgency that inspires the public to demand regulatory responses. The prospect of thousands and even millions of cancer deaths led to the Montreal Protocol. The Cuyahoga River catching on fire, giant algae blooms in lakes and rivers, and widespread contamination of municipal water supplies led to the Clean Water Act of 1972. Oppressive inner-city smog — so bad you could nearly taste it — as well as mounting respiratory illnesses, and dead and dying trees, streams and lakes, helped overcome political and industry foot-dragging and created the landmark 1990 amendments to the Clean Air Act and its innovative cap-and-trade system for controlling ground-level pollutants.



Climate change, by contrast, has for a long time been seen as remote, something for future generations to worry about, and in polls has appeared far down on the list of voters' concerns.

In addition, there were no relatively expeditious technological fixes for carbon emissions, as there were for fluorocarbons, and as there were for the pollutants addressed in the 1990 Clean Air Act Amendments, like scrubbers for power plants, and catalytic converters and cleaner fuels for cars and light trucks. The global warming problem requires a whole suite of fixes, some of them mammoth, as Mr. Moynihan intuited a half-century ago — carbon-free alternatives to produce electricity; an all-electric vehicle fleet; an end to deforestation; climate-friendly agricultural practices; large-scale dietary changes; and, quite possibly, advanced technologies to draw carbon dioxide out of the atmosphere. Reimagining the world economy means turning around a very big ship. Not to mention global buy-in.

Finally, despite predictable industry warnings of economic ruin, the efforts to protect the ozone layer and clean up the nation's waters and air faced nowhere near the campaign of denial and disinformation mounted by Exxon Mobil and other big fossil fuel companies — companies that knew perfectly well what their products were doing to the atmosphere — to confuse the public about climate change and to derail serious attempts to address them. This cascade of phony science was not the only reason legislation aimed at reducing carbon pollution foundered in Congress. As Bill Clinton and Mr. Gore discovered after signing the Kyoto Protocol in 1997, there was little enthusiasm in either party for a treaty that essentially required America and other industrial nations to do most of the heavy lifting while giving other big emitters, among them China and India, a far easier path. Still, industry's relentless obfuscation played a big role, especially among Tea Party Republicans.

Are there reasons now to hope for serious action? Yes: a trifecta of frightening reports in the last year from the Intergovernmental Panel on Climate Change on the need to act before things spin out of control, on deforestation and other damaging land-use practices, on dying reefs and rising sea levels. Plus: a cascade of natural disasters, including catastrophic wildfires and hurricanes. Plus: the dramatic drop in the cost of producing carbon-free energy like wind and solar power. Plus: well-publicized concerns on the part of every contender for the Democratic presidential nomination, and equally well-publicized efforts by state and local officials, to fill the global leadership vacuum left by President Trump.

What David Doniger, a climate expert at the Natural Resources Defense Council, calls a “one-two punch of irrefutable science and irrefutable experience” has clearly raised public awareness and, perforce, the political temperature. To all this should be added the experience of Montreal and Kigali, and the catastrophe that did not happen.

[The New York Times, 7 December 2019](#)

Featured



OZONE SECRETARIAT

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

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

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

The UN Environment Assessment Panels

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

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

[The Technology and Economic Assessment Panel](#)

[The Scientific Assessment Panel](#)

[The Environmental Effects Assessment Panel](#)

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

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



THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

- [Documents and information note for the 84th meeting of the Executive Committee](#), Montreal, Canada, 16-20 December 2019

- [Executive Committee Primer – 2019](#) - An introduction to the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol

- [Report of the 83rd meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol](#), Montreal, Canada, 27-31 May 2019

- [83rd meeting of the Executive Committee](#)

- [82nd meeting of the Executive Committee](#)

[Learn more](#)



OZONACTION

OzonAction Factsheet: Article 7 Data Reporting on HFCs - When Countries Need to Start Reporting

One of the important commitments of the Protocol is that of reporting the consumption and production of substances controlled under the Montreal Protocol.

Following ratification of the Kigali Amendment, this commitment is now extended to HFCs.

This short factsheet provides some useful information on relevant Article 7 reporting dates and deadlines for HFCs.

[Download the Factsheet](#)

Contact: Dr. Ezra Clark, UNEP, OzonAction



HS Codes for HFCs - Advice for countries in advance of the 2022 HS code update - The Kigali Amendment requires Parties to put into place an import and export licensing system for hydrofluorocarbons (HFCs) by 1st January 2019 (or two years later if required).

To enable a licensing system to function effectively, it is important that the government is able to monitor and record imports and exports of each specific HFC individually.

Import and export statistics are normally collected by customs officers using the international product nomenclature system – the Harmonized Commodity Description and Coding System, or Harmonized System (HS).

However, until the HS is revised in 2022, all HFCs are contained in a single HS code which does not allow differentiation of the individual chemicals or of mixtures.

This document outlines a proactive interim approach, recommended by the World Customs Organization (WCO), to establish additional digits in the existing national HS codes to identify specific HFCs.

This practical document is suitable for outreach to the customs agencies, customs officers in the field, and others involved in controlling trade in HFCs.

Document prepared by the UN Environment Programme in cooperation with the World Customs Organization (WCO).

[Download the publication](#)

Contact: Dr. Ezra Clark, UNEP, OzonAction



Update on new refrigerants designations and safety classifications - factsheet - 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.

The United Nations Environment Programme (UNEP), represented by the OzonAction-Law Division, and ASHRAE have a Memorandum of Understanding to establish technical cooperation and mutual coordination toward providing professional technical services to the refrigeration and air-conditioning stakeholders (governmental, private, and public). The organizations work to ensure that up-to-date related technical information and standards are properly introduced and promoted.

Download the Factsheet

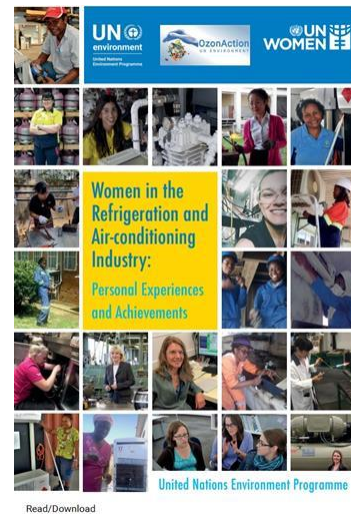
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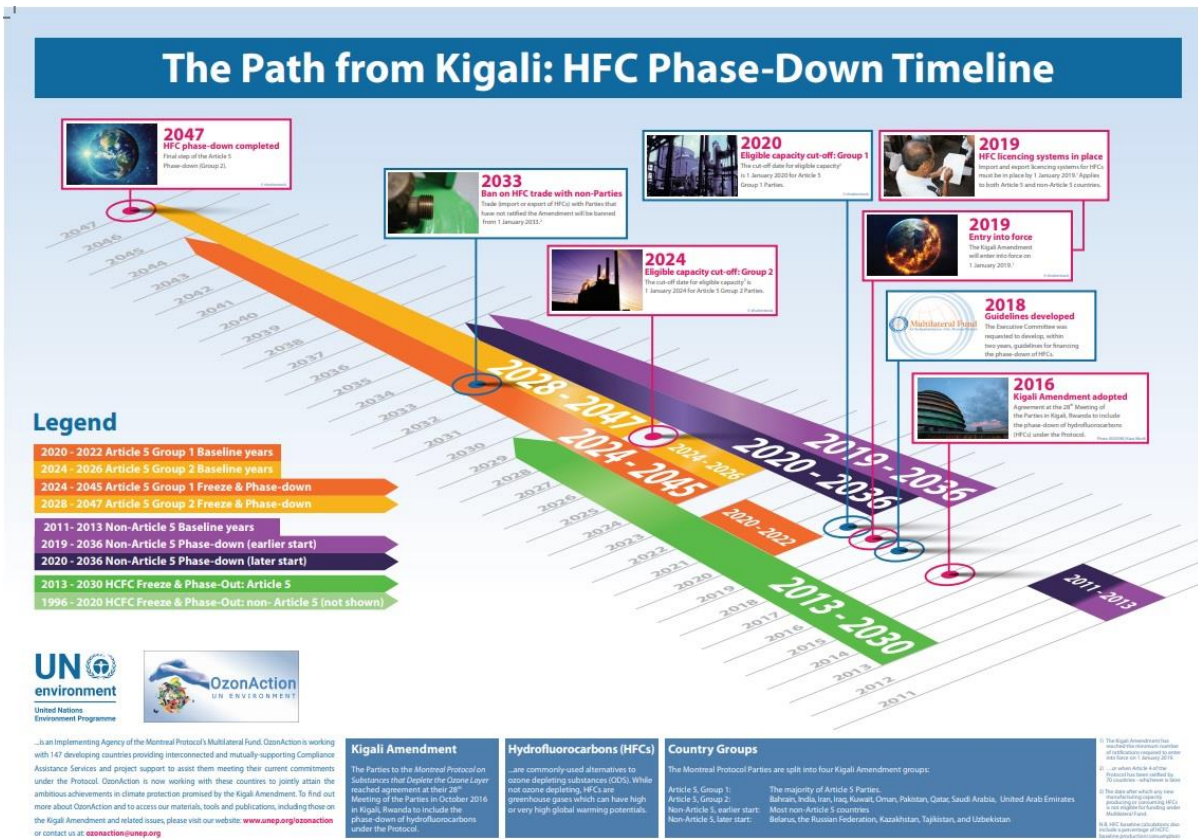
W. Stephen Comstock, Manager of Business Development EMEA, ASHRAE
Ayman Eltalouny, Coordinator International Partnerships, UN Environment OzonAction



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.

Download the publication





The Path from Kigali: HFC Phase-Down Timeline

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

Click [here](#) to download the timeline



Good Servicing: Flammable Refrigerants Quick Guide

This is the electronic and interactive version of the UN Environment OzonAction Quick Guide on Good Servicing Practices for Flammable Refrigerants. It offers easy reference to the key safety classification and technical properties of flammable refrigerants that are available in the market.

It also provides important safety guidance for the installation and servicing of room air-conditioners designed to use flammable refrigerants.

This interactive guide allows you to scroll and browse the text, jump to specific chapters or use the comprehensive dynamic index to locate specific keywords, figures and tables. The application also includes a refrigerant charge size calculator and a room size calculator for flammable refrigerants.

Available for free on the [Google play store](#) (Apple version coming soon).

Search for "UNEP Quick guide" or use the QR code



Refrigerant Identifier Video Series

Guidance on how to identify refrigerants using a refrigerant identifier.

This new OzonAction video series consists of short instructional videos showing how to use and maintain a refrigerant identifier.

The videos provide useful guidance on safety and best practice, understanding the difference between different identifier units, testing procedures and identification of results.

It is intended for use by Montreal Protocol National Ozone Officers, Customs and Enforcement Officers as well as technicians involved in the servicing

and maintenance of refrigeration and air conditioning systems.

The application features 10 short instructional videos on the following topics:

- Refrigerant cylinder types
- Types of identifiers
- Getting to know your identifier
- Safety and precautions
- Testing a sample – vapour (gas)
- Testing a sample – liquid
- Results
- Faults & error messages
- Maintaining the unit
- Software updates

Available for free on the Google play store (Apple version coming soon).

Search for “UNEP Refrigerant ID” or use the QR code

New videos available on the OzonAction RAC video application

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

50,000 downloads and counting!

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



GWP-ODP Calculator Smartphone Application

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

- Helps in understanding and reporting under the Montreal Protocol (and future commitments under the Kigali Amendment)
- The calculator will automatically perform the conversion between metric tonnes, ODP tonnes and/or CO₂-equivalent tonnes (or kg) and display the corresponding converted values
- The app includes both single component substances and refrigerant blends
- The components of a mixture and their relative proportions (metric, ODP, CO₂-eq) are also displayed.

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

Download it Now!



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

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

OzonAction Smartphone Application WhatGas?

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

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



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

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

background and significance of this Kigali amendment.

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

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

OzonAction Factsheets



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

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

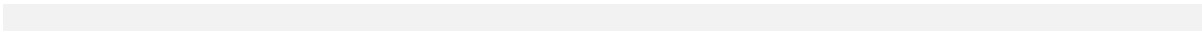
HS codes for HCFCs and certain other Ozone Depleting Substances ODS (post Kigali update).

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

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

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

Tools Commonly used by Refrigeration and Air-Conditioning Technicians.





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

OzonAction has launched an exciting new application which hosts series of short instructional videos on techniques, safety and best practice for refrigeration and air-conditioning technicians.

This application, consisting of short instructional videos on techniques, safety and best practice, serves as a complementary training tool for refrigeration and air-conditioning (RAC) sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training.

New videos on flammable refrigerants just added!

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

OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series

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

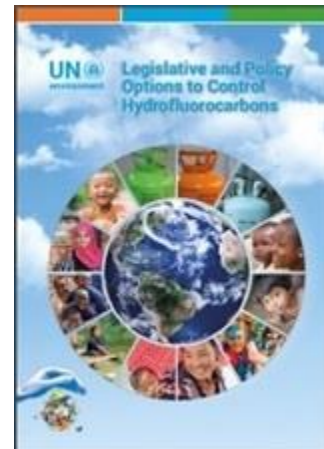
(Just search for "OzonAction", or scan this QR code)

Publications

Legislative and Policy Options to Control Hydrofluorocarbons

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

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



Reading

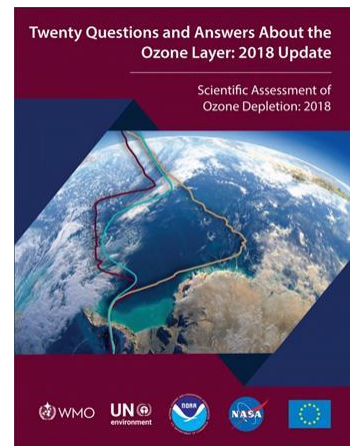
[Twenty questions and answers about the ozone layer: 2018 update](#), is a component of the Scientific Assessment of Ozone Depletion: 2018 report. The report is prepared quadrennially by the Scientific Assessment Panel (SAP) of the Montreal Protocol on Substances that Deplete the Ozone Layer.

Lead Author: Ross J. Salawitch

Coauthors: David W. Fahey, Michaela I. Hegglin, Laura A. McBride, Walter R. Tribett, Sarah J. Doherty

Read / Download:

[20 Questions and Answers about the ozone layer-2018](#) | [Figures](#)



[Primer on Hydrofluorocarbons \(HFCs\)](#) - IGSD -11 January 2018

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

Lead authors:

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

Contributing authors:

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



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

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

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

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



[Impact of Standards on Hydrocarbon Refrigerants in Europe – Market research report](#). The market research report was realised for the EU-funded **LIFE FRONT** project. Amongst the main result of the market research:

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



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



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

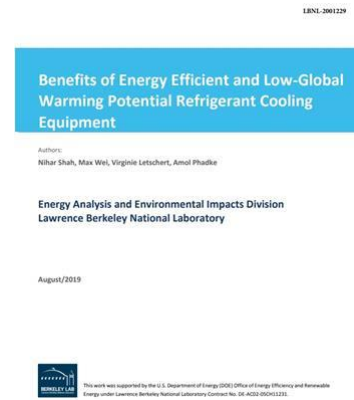


[Ozone-depleting substances 2019 Aggregated data reported by companies on the import, export, production, destruction, feedstock and process agent use of ozone-depleting substances in the European Union, 2006-2018](#) 1994-2019 - The 2019 edition of the European Environment Agency (EEA) report on ODS confirms that the EU has already achieved its goals on the phase-out of such substances under the Montreal Protocol. In particular, the report shows that in 2018, the consumption of ODS (an aggregated parameter that integrates imports, exports, production and destruction of ODS, except those for feedstock use) in the EU was negative (-1 505 metric tonnes), which means that more ODS were destroyed or exported than produced or imported. This was the case since 2010 with the exception of 2012. These negative values are the result of the phase-out according to Regulation (EC) No 1005/2009, which, in many aspects, goes further than the Montreal Protocol, in combination with rather high destruction rates and decreasing stocks. Companies in the EU have been consuming relatively small amounts of ODS under the Montreal Protocol.



[Benefits of Energy Efficient and Low-Global Warming Potential Refrigerant Cooling Equipment](#)

Authors: Nihar Shah, Max Wei, Virginie Letschert, Amol Phadke.
 Energy Analysis and Environmental Impacts Division
 Lawrence Berkeley National Laboratory
 August/2019

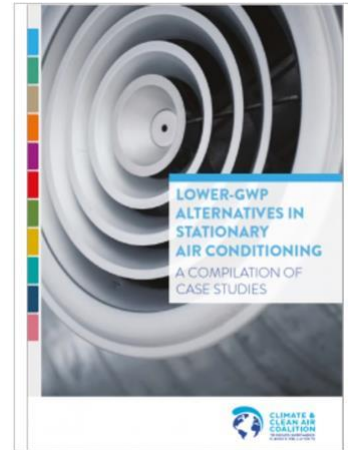


The Economist Intelligence Unit (EIU) newly launched report [The Cooling Imperative: Forecasting the size and source of future cooling demand](#) forecasts the size and source of future cooling demand out to 2030. Commissioned by the Kigali Cooling Efficiency Program (K-CEP), this report quantifies the cooling market in unit sales and financially and maps out what the transition to more efficient, climate-friendly cooling could look like.



Lower-GWP Alternatives in Stationary Air Conditioning: A Compilation of Case Studies -The case studies in this booklet discuss several applications in the stationary air conditioning sector. The applications include chillers of natural refrigerants and hydrofluoroolefins (HFOs) as well as split-units which use hydrocarbons (HCs) as the refrigerant. The technologies presented in these case studies are only some examples of the many available options for zero and lower GWP substances. The examples take into account design criteria such as system performance, environmental impact and cost. All these refrigerants still have many challenges that should be considered in the design, for example their flammability, toxicity, lower efficiency in some cases, and cost. Balancing these challenges using a consistent and comprehensive methodology across all refrigerants and system types is essential in assessing alternatives...

Climate and Clean Air Coalition (CCAC), 2019



Miscellaneous



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

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

We are pleased to invite you to submit your nomination*, and/or nominate Ozone Layer Champion(s). **The short profile should reflect the nominee's valuable work related to the Montreal Protocol and ozone layer protection.**

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

We look forward to receiving your nomination(s), and please feel free to

contact our team for any further assistance concerning your nomination.

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

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

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



New International Journal of Refrigeration service for IIR members -

Access the complete archives of the International Journal of Refrigeration (IJR) online. Designed with IIR members in mind, this new and practical electronic subscription gives members substantial advantages:

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



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

Climate friendly refrigeration in the Organic Food Retail / Small Store Sector - Last chance to participate in "Refrigerants, Naturally!" [online market survey](#) - [deadline extended until 18 December 2019](#)



Climate friendly refrigeration in the Organic Food Retail / Small Store Sector - Last chance to participate in our online market survey - deadline extended until 18 December!

If you have already filled in the Refrigerants, Naturally! for LIFE surveys, we would like to thank you very much for your contribution.

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Prepared by: Samira Korban-de Gobert, OzonAction

Reviewed by: Dr. Ezra Clark, OzonAction

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