See online

In this issue:

Global

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

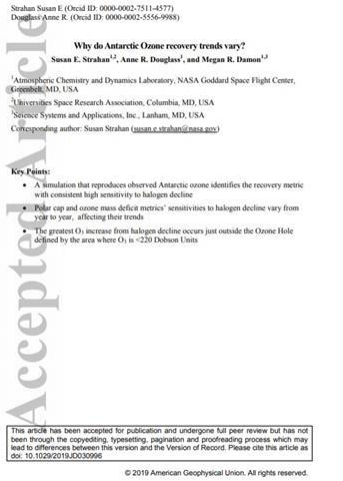
The purpose of this fact sheet is to provide an update on ASHRAE standards for refrigerants and to introduce the new refrigerants that have been awarded an «R» number over the last few years and introduced into the international market.

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

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

2. Why do Antarctic Ozone recovery trends vary?



Introduction

We use satellite ozone records and Global Modeling Initiative (GMI) chemistry transport model (CTM) simulations integrated with MERRA2 meteorology to identify a metric that accurately captures the trend in Antarctic ozone attributable to the decline in ozone depleting substances (ODSs).

The GMI CTM Baseline simulation with realistically varying ODS levels closely matches observed interannual to decadal scale variations in Antarctic September ozone over the past 4 decades.

The expected increase or recovery trend is obtained from the differences between the Baseline simulation and one with identical meteorology and fixed 1995 ODS levels. The differences show that vortex-averaged column O_3 [ozone] has the greatest sensitivity to ODS change from 1-20 Sep. The observed vortex-averaged column O_3 during this period produces a trend consistent with the expected recovery attributable to ODS decline. Trends from dates after 20 Sep have smaller sensitivity to ODS decline and are more uncertain due to transport variability.

Simulations show that the greatest decrease in O_3 loss (i.e., recovery) occurs inside the vortex near the edge. The polar cap metrics have vortex size dependent bias and do not consistently sample this region. Because the 60-90o S 220 DU O_3 mass deficit (OMD) metric does not sample the edge region, its trend is lower than the expected trend; this is improved by area weighting.

The 250 DU OMD metric samples more of the edge region, which increases its trend. Approximately 25% of the September Antarctic O_3 increase is due to higher O_3 levels in June prior to winter depletion.

Summary

Atmospheric levels of ozone depleting substances (ODSs) are decreasing due to the Montreal Protocol and its amendments. The Ozone Hole is beginning to shrink, but trends derived from Antarctic O_3 observations differ widely.

We compared model simulations with different ODS levels to reveal where, when, and how much Antarctic O_3 increases in response to ODS decline. We found that trend studies used O_3 measurements from different dates and regions, which usually did not line up with regions where the greatest O_3 recovery occurs or with the time period when O_3 changes are most sensitive to declining ODSs. This explains why reported trends and their uncertainties vary so much.

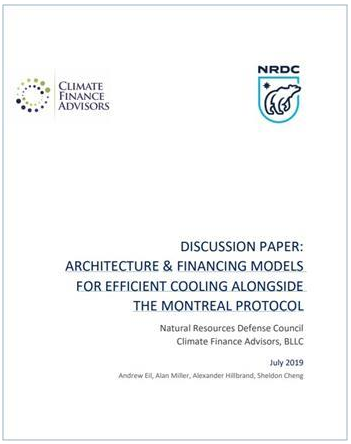
Our simulations found the strongest, clearest signal of increasing O_3 due to ODS change between 1-20 Sep inside the Antarctic polar vortex. The observed vortex O_3 trend from 1-20 Sep is 1.2-1.6 DU/yr and is consistent with the simulations' results, indicating that O_3 is increasing at the rate expected due to ODS decrease. The greatest recovery occurs inside the vortex but just outside the O_3 220 DU contour, the traditionally defined boundary of the Ozone Hole. Simulations and observations agree that the September Ozone Hole is shrinking at 0.24-0.36 million km2/yr. [...]

Excerpt from the article published in American Geophysical Union (AGU), July 2019.

Authors: Susan E. Strahan, Anne R. Douglass, and Megan R. Damon

The American Geophysical Union (AGU), July 2019

3. Architecture and financing models for efficient cooling alongside the Montreal Protocol - Discussion paper



Executive Summary

Clean, efficient cooling – thermal comfort achieved while minimizing use of harmful refrigerants and energy – is urgently needed to mitigate climate change, protect public health from the dangers of heat, promote sustainable development, and reap the economic and environmental benefits of reducing energy demand.

The proven institutional machinery of the Montreal Protocol is being put to work phasing down hydrofluorocarbons (HFCs), a critical piece of the puzzle. Cooling efficiency, however, has no equivalent international institution or fund dedicated to it; it is but one of many issues on the agendas of the multilateral climate funds. Cooling efficiency support has therefore been provided mostly in an ad hoc, uncoordinated manner, failing in particular to capitalize on the Montreal Protocol's work phasing out ozone depleting substances (ODSs) from appliances whose energy use is significant.

The Montreal Protocol community has discussed ways to maximize the climate benefits of its chemical transitions for over a decade, including via energy efficiency. Addressing hurdles to energy efficiency in a coordinated fashion, however, introduces hurdles of its own. The World Bank's work with the Global Environment Facility (GEF) and the Multilateral Fund (MLF), for example, to implement co-financed projects to phase out ODSs and increase energy efficiency was met with mixed success.

Challenges related to the predictability of energy efficiency funds, mismatches in approach, greater transaction costs, risks associated with blended finance, the need for inter-institutional coordination, and a dearth of political will hindered these and other efforts to fund energy efficiency alongside refrigerant transitions.

A plan for efficient cooling finance can be built from solutions to these known barriers; streamlining operation of any cooperative effort through a variety of approaches is essential. There remains strong stakeholder support for doing so: in 2018, at the 30th Meeting of Parties, parties instructed some of their key bodies to liaise with other climate funds and financial institutions to evaluate the possibility of "mobilizing additional resources and, as ap ropriate, [setting] up modalities for cooperation" to support energy efficiency alongside the HFC phasedown (Dec. XXX/5 para 7). Other institutions are also taking a closer look at cooling efficiency; the World Bank, for example, launched an initiative to accelerate the uptake of sustainable cooling solutions this year.

This paper reviews the initiatives of the Montreal Protocol and climate finance communities that offer precedents for a cooperative cooling efficiency program. Noting the breadth of institutions potentially involved, it describes four generic institutional arrangements, or models, for collaboration among institutions: an energy efficiency 'sidecar' to the MLF; a dedicated donor facility housed at a multilateral climate fund or development financial institution; a formal mechanism of inter-institutional coordination; and an increase in disparate, ad hoc activities. They are described in brief in the chart on the following page.

One or a combination of these models may be deployed to enhance energy efficiency alongside the work of the Montreal Protocol or, to even greater effect, transform multilateral support for cooling efficiency well beyond the interface of cooling efficiency with the Montreal Protocol.

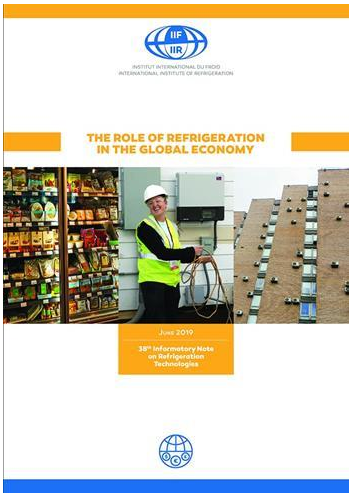
There are several next steps to get an efficient cooling program off the ground: stakeholders should begin engaging to agree the challenges to be addressed and solutions available; funding should be allocated to support development of a plan, including analytical work, consultations, and more; and pilot programs should be

developed to provide the evidence base for a major cooling efficiency program. Interested institutions should meanwhile explore near-term opportunities to increase their effectiveness.

Authors: Andrew Eil, Alan Miller, Alexander Hillbrand, Sheldon Cheng

Natural Resources Defense Council Climate Finance Advisors, BLLC, July 2019

4. The role of refrigeration in the global economy



"Over 15 million people are employed worldwide in the refrigeration sector which consumes about 20% of the overall electricity used worldwide."

In this Note, the International Institute of Refrigeration (IIR) estimates that the total number of refrigeration, air-conditioning and heat pump systems in operation worldwide is roughly 5 billion, with global annual sales of such equipment amounting to roughly 500 billion USD.

Statistical data presented in this new Informatory Note highlight the importance of the refrigeration sector which is expected to grow further in the coming years because of increasing cooling needs in numerous fields and global warming.

An update of a first version published by the IIR in November 2015, this 38thIIR Informatory Note summarises basic data illustrating size and reach of the refrigeration sector and its importance for mankind. It aims to raise policy makers' awareness on the growing importance of refrigeration in order to further encourage its development in a sustainable manner, particularly in the least developed countries.

"Refrigeration is of paramount importance for mankind and must become a priority for policy makers."

This Note was prepared by Jean-Luc Dupont (Head of the Scientific and Technical Information Department) and reviewed by Piotr Domanski (President of the Science and Technology Council), Philippe Lebrun (President of the General Conference) and Felix Ziegler (President of the Executive Committee).

The International Institute of Refrigeration (IIR), 16 July 2019

Africa

5. Montreal Protocol and Legal Experts from Southern African Development Community countries team up for Kigali Amendment

Victoria, Mahe, Seychelles, 24 June 2019 – The historic Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer entered into force on 1 January 2019, ushering in a new era of enhanced ozone and climate protection.

For the 74 developed and developing countries that have ratified this amendment to date, it brings with it new commitments to phase down the production and consumption of hydrofluorocarbons (HFCs), potent man-made greenhouse gases used extensively in refrigeration, air conditioning, plastic foam and other applications. Understanding how to best meet these commitments requires intensive consultations, preparations and actions by different stakeholder groups at the national level to enable the Kigali Amendment. To this end, UN Environment Programme, OzonAction in cooperation with the Seychelles Ministry of Environment, Energy, and Climate Change brought together National Ozone Officers and legal experts from 13 countries of the Southern African Development Community (SADC) to Victoria, Seychelles, from 19-21 June 2019 to help the countries prepare for ratification and implementation of the Kigali Amendment.

A key challenge for developing countries is to simultaneously implement the timely phase out of remaining hydrochlorofluorocarbon (HCFC) consumption while at the same time preparing for the phase down of HFCs. This is particularly crucial for the refrigeration and air conditioning servicing sector, which represents the

majority of HCFC and HFC use in most countries that consume low volumes of those substances. Under the Kigali Amendment, all countries need to ensure legal preparedness by adjusting laws and regulations, and adopt energy-efficient and climate-friendly technologies.

The workshop was opened by Mr. Wallace Cosgrow, the Minister of Environment, Energy and Climate Change. He highlighted the importance and timeliness of the workshop as most countries in the region are embarking on the ratification of the Kigali Amendment. After providing a brief overview of the Seychelles progress in ratifying the amendment and the country's major Montreal Protocol-related achievements, he assured participants that the ratification process would be completed in the coming weeks.

While two countries in the region have already ratified the Kigali Amendment – Malawi and Namibia – other countries were encouraged to take the necessary steps at the national level to complete the ratification process at the earliest possible time. Participants noted that beyond the process of ratification and domestication, there is need for more investments into the actual implementation of the Kigali Amendment.

They also acknowledged that while consultations are important and integral to the process, there is need to ensure that these consultations are thorough, extensive and inclusive.

Stakeholders must be identified and analyzed in order to ensure that information is given to them in a timely manner and that their views and feedback are included in the decision-making processes.

The meeting participants identified several important areas for attention. First, responsible departments/institutions including National Ozone Units (NOUs) must be innovative and proactive in terms of securing the support of decision-makers within their executive and legislative branches of governments. Countries are urged to be time-sensitive in resolving the holdups and challenges in the process of ratification, domestication, and implementation.

Second, countries are encouraged to introduce regulatory measures for HFCs and to review their licensing systems and to incorporate HFCs conjointly with the ratification process. The meeting urged UNEP to include the exchange of licensing/drafting experiences in the agendas of Regional Network meetings in 2020.

Lastly, countries are encouraged to carefully assess alternatives to HFCs and select suitable and long-term solutions for each sub-sector. The countries highlighted the importance of various incentives for introduction of low-global warming potential alternatives and "green" technologies to encourage the refrigeration and cooling sector to shift to sustainable alternative technologies.

The workshop, which was organized as part of OzonAction's Regional Networks of Ozone Officer for Anglophone Africa, achieved its goal of bringing together and engaging the Ozone Officers and their legal experts who are the key players in reviewing, detecting and resolving bottlenecks and challenges in the processes of ratification, domestication and implementation of the Kigali Amendment.

Contact:

Patrick Salifu, Montreal Protocol Regional Coordinator,
Anglophone Network, Compliance Assistance Programme
UN Environment Law Division

Florence Asher, Montreal Protocol Programme Officer, Compliance Assistance Programme, UN Environment Law Division

United Nations Environment Programme, OzonAction, 24 June 2019

6. Training-workshop on refrigeration and air conditioning - Eritrea

Asmara, 25 July 2019 – The Ministry of Land, Water and Environment organized a training-workshop from 22-24 July here in the capital Asmara on ensuring sound management of refrigerant gases and equipment that work through the gases.

According to report, several staff members from the Ministry of Land, Water and Environment, Ministry of Trade and Industry, Ministry of Education, Ministry of Energy and Mines, Livestock and Crops Corporation, as well as Red Sea Corporation attended the one-day workshop organized yesterday, 24 July at the National Confederation of Eritrean Workers Hall.

The overall objective of the theoretical and practical two-day training organized for professionals from the government and private sectors is to upgrade the knowledge and skills of stakeholders and technicians to promote sound management of Ozone depleting substances, greenhouse and refrigeration gases among others.

Speaking at the workshop, D.G. of Environment, Mr. Mogos Weldeyohaness noting the negative impact of refrigerant gases on depleting Ozone, greenhouse effect, human health, deterioration and environmental degradation said that the training workshop is part of the effort the Ministry has been exerting to equip professionals with the necessary knowledge and skill.

Mr. Robel Kibrom, from the Department of Land on his part, indicating that the main purpose of the training and workshop is to upgrade the knowhow of stakeholders and equipthem with timely information, called on all concerned bodies to participate in similar trainings that will be organized in the future.

UNIDO representative and trainer, Mr. Marvin Loga on his part pointing out the significance of the training in the protection of Ozone and the environment, stated that the training was effective and successful.

Underlining the importance of the training-workshop, the trainees and participants of the workshop called for the sustainable organization of similar training programs.

Eritrea Ministry of Information, 25 July 2019

Asia Pacific

7. Philippines on right track in global phaseout of HCFC

CEBU CITY -- A high-ranking official of the United Nations Environment Program (UNEP) on Tuesday said the Philippines is on the right track in implementing global phaseout of ozone-depleting substance (ODS) utilization.

Shaofeng Hu, UN Environment's regional coordinator on Montreal Protocol, said the Philippines is "already ahead of schedule for the 35 percent reduction target" against importation and consumption of ozone-depleting potentials (ODP), especially refrigerants of cooling systems. […]

Shaofeng said among the challenges many ASEAN countries are facing in complying with the agreement is the prolonged process in the selection of alternative technologies of HCFC to balance long-term and short-term interests as well as safety concerns on such alternatives.

The Philippines News Agency (PNA), 30 July 2019, By: John Rey Saavedra

Europe & Central Asia

8. Protect your business: Buy refrigerants from safe sources!

As part of a broader communications campaign, four leading associations in the heating, ventilation, air conditioning and refrigeration (HVACR) sector – EPEE, AREA, ASERCOM and EFCTC – have joined forces in an unprecedented effort to call upon European installers to support the fight against illegal trade of refrigerants and buy refrigerants from safe sources.

To this end, the associations have developed a leaflet for installers highlighting the risks illegal trade of refrigerants entails.

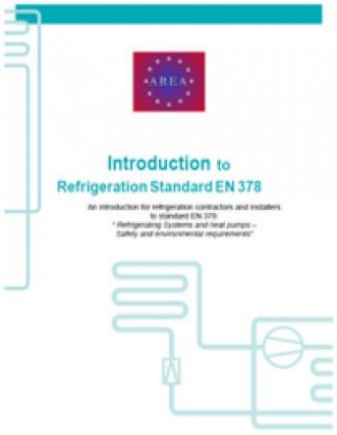
Protect your business – Buy refrigerants from safe sources!

Download the leaflet in English

And stay tuned for translations of the leaflets to come!

European Partnership for Energy & the Environment (EPEE), 18 July 2019

9. Introduction to refrigeration standard EN 378



European Standard EN 378 relates to safety and environmental requirements in the design, manufacture, construction, installation, operation, maintenance, repair and disposal of refrigerating systems and appliances regarding local and global environments.

This booklet introduces the Refrigeration Standard EN 378 to those responsible for refrigeration systems and heat pumps, and especially to Refrigeration, Air Conditioning and Heat Pump Contractors.

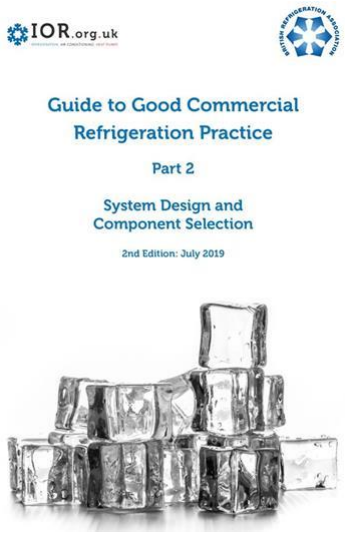
Following the standard will assist Contractors to design, manufacture, install, commission and maintain refrigeration systems and heat pumps to ensure best practice. In addition, many requirements of local authorities for safety and environmental protection will be taken care of.

The Refrigeration Standard EN 378 is an important source of information which if followed can increase the level of safety of refrigeration installations and help prevent accidents.

For all refrigerants there are risks associated with pressure, fire or explosion hazard, or toxicity; this means that both professionals and the public can be compromised if best practices are not followed. The booklet therefore focuses on important points related to the safe use of refrigerants.

Air conditioning and Refrigeration European Association (AREA), July 2019

10. Revised Part 2 of the Guide to Good Commercial Refrigeration Practice series



The British Refrigeration Association and Institute of Refrigeration have revised Part 2 of the Guide to Good Commercial Refrigeration Practice series.

This series was produced to ensure good practice guidelines are available to the refrigeration, heat pump and air conditioning professional community. This title forms part of a nine-titled series that covers all the disciplines of commercial refrigeration. Part 2 focuses on the complex area of system design in conjunction with safety and environmental considerations. It comprises chapters on: compressors, chilled and frozen cabinets, condensers, refrigerant pipework, design considerations, plant room design and more. In this edition the chapter on evaporators has been extensively revised and references have been updated throughout.

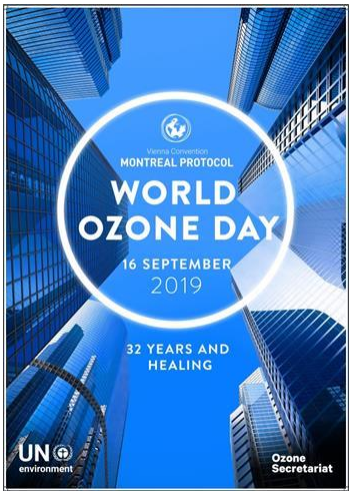
The other eight parts are currently under revision and are expected to be published over the next 12 months.

ACR Journal UK, 24 July 2019

Featured

OZONE SECRETARIAT

32 Years and Healing -
Theme for World Ozone Day 2019



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

Click here for Montreal Protocol upcoming Meetings Dates and Venues

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

The UN Environment Assessment Panels

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

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

The Technology and Economic Assessment Panel

The Scientific Assessment Panel

The Environmental Effects Assessment Panel

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

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

THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

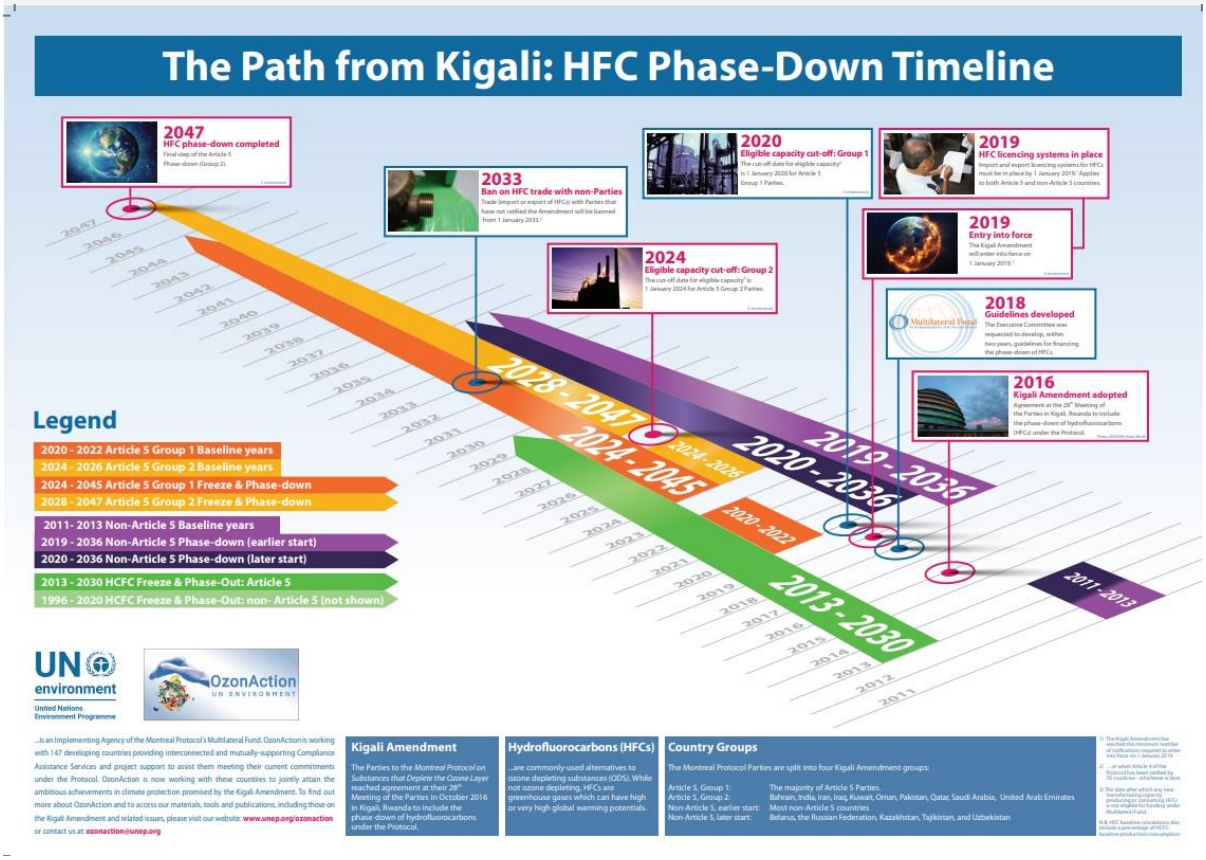
- Report of the 83rd meeting of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, Montreal, Canada, 27-31 May 2019
- 83rd meeting of the Executive Committee
- 82nd meeting of the Executive Committee

Learn more

OZONACTION

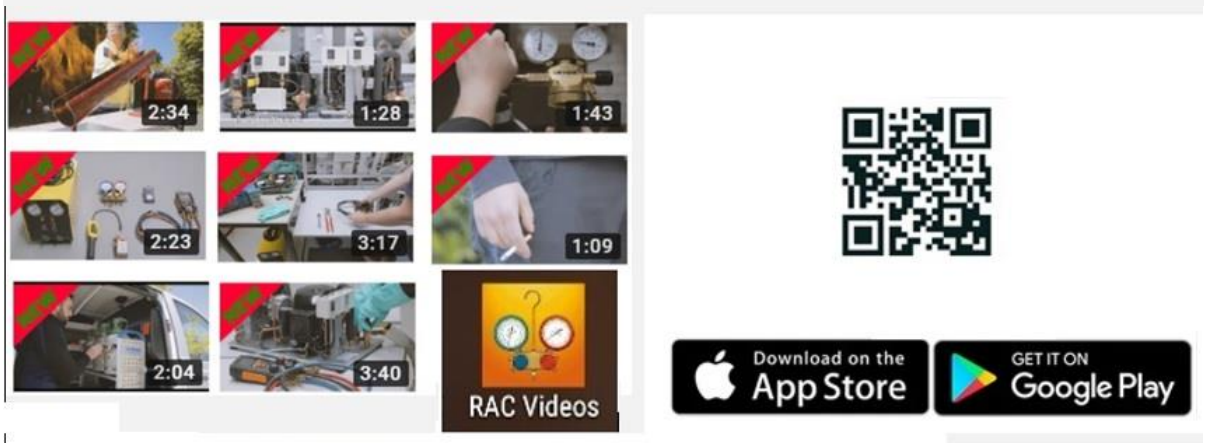
Post-Meeting Feedback Survey - OzonAction Second Global Inter-Regional and Parallel Network Meetings for National Ozone Officers, 17-20 February 2019.

Read/Download: Meeting report | Full survey report



The Path from Kigali: HFC Phase-Down Timeline

This timeline, produced by OzonAction, highlights key hydrofluorocarbons (HFCs) phase-down dates.
Click here to download the timeline



New videos available on the OzonAction RAC video application

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

50,000 downloads and counting!

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

GWP-ODP Calculator Smartphone Application

The application allow you to easily convert ODP, CO_2-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 CO_2-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, CO_2-eq) are also displayed.

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

Download it Now!

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

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

OzonAction Smartphone Application WhatGas?

Available for free in the Google Play and Apple IOS Store

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

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

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

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

OzonAction YouTube | See also: United Nations Treaty Collection

OzonAction Factsheets

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

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

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

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

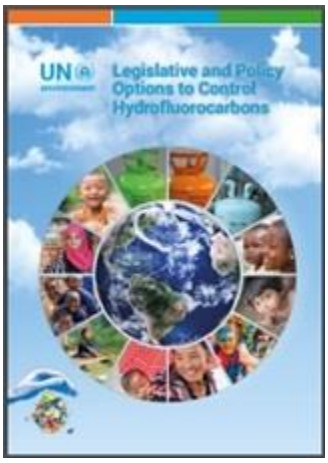
Refrigerant Blends: Calculating Global Warming Potentials (post-Kigali update).
Global Warming Potential (GWP) of Refrigerants: Why are Particular Values Used? (post-Kigali update).
Tools Commonly used by Refrigeration and Air-Conditioning Technicians.

OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series - Over 50,000 downloads to date - OzonAction has launched an exciting new application which hosts series of short instructional videos on techniques, safety and best practice for refrigeration and air-conditioning technicians.
This application, consisting of short instructional videos on techniques, safety and best practice, serves as a complementary training tool for refrigeration and air-conditioning (RAC) sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training.

New videos on flammable refrigerants just added!
Please share with your RAC associations, technicians and other interested stakeholders…

OzonAction Multimedia Video Application: Refrigeration and Air-conditioning Technician Video Series
Available in the Android Play Store and Apple Store/**iTunes.**
(Just search for "OzonAction", or scan this QR code)

Publications



Legislative and Policy Options to Control Hydrofluorocarbons
In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures.
This booklet contains a recommended set of legislative and policy options which the developing (Article 5) countries may wish to consider for implementation. It is intended to be a guide/tool for countries.

Latest issue of the Centro Studi Galileo - Industria & Formazione. La rivista per il tecnico della refrigerazione e della climatizzazione, N. 5, 2019

Events

2019

- 25th IIR International Congress of Refrigeration - 24-30 August 2019, Montreal, Canada

Click here for more information / International Institute of Refrigeration

Please feel free to share with us relevant events.

Reading

Twenty Questions and Answers About the Ozone Layer, presents complex science in a straightforward manner. It complements the 2014 Scientific Assessment Report of Ozone Depletion by WMO and the U.N. Environment Programme.

Lead Author:
Michaela I. Hegglin
Coauthors:
David W. Fahey, Mack McFarland, Stephen A. Montzka, Eric R. Nash

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

Summary:
Fast action under the Montreal Protocol can limit growth of hydrofluorocarbons (HFCs), prevent 100 to 200 billion tonnes of CO_2-eq by 2050, and avoid up to 0.5°C of warming by 2100.

Lead authors:
Durwood Zaelke, Nathan Borgford-Parnell, and Stephen O. Andersen.
Contributing authors:
Kristin Campbell, Xiaopu Sun, Dennis Clare, Claire Phillips, Stela Herschmann, Yuzhe Peng Ling, Alex Milgroom, and Nancy J. Sherman.

The IIR International Dictionary of Refrigeration Available in 11 languages, the complete version of the International Institute of Refrigeration (IIR) International Dictionary of Refrigeration is now freely accessible online. The IIR International Dictionary of Refrigeration offers researchers, industrialist or administrations the practical resources required to produce content related to refrigeration technologies in multiple languages.
This online tool allows you to find definitions, in English and French, of scientific and technical terms, as well as identify terms in the language of your choice and find corresponding translations in the 10 other languages.
The dictionary provides term searches in Arabic, Chinese, Dutch, English, French, German, Italian, Japanese, Norwegian, Russian and Spanish.
Access the International Dictionary of Refrigeration on the IIR website

Impact of Standards on Hydrocarbon Refrigerants in Europe – Market research report. The market research report was realised for the EU-funded LIFE FRONT project. Amongst the main result of the market research:
• Current charge limits set in standards both restrict and obstruct the development of hydrocarbon technology
• Over 50% survey respondents already work with hydrocarbons to some extent
• Most of those planning to start working with hydrocarbons in the future will do that in 2019-2020 timeframe - revision of standards could have a major impact on the scale of this shift
• Large proportion of respondents indicated they manufacture equipment using multiple refrigeration circuits - allowing higher hydrocarbon charge limits per single refrigeration circuit would have a profound impact on cost and availability of larger units.

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

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

Miscellaneous

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

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

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

Please notify and nominate worthy candidates through the on-line form

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

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

• View the «Montreal Protocol Who's Who» Introductory video
• Contact : Samira Korban-de Gobert, UN Environment, OzonAction

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

The International Institute of Refrigeration supports World Refrigeration Day - As the only independent intergovernmental organisation in the field of refrigeration, the International Institute of Refrigeration (IIR) joins associations and companies worldwide to support the initiative of an official World Refrigeration Day on 26 June every year. The annual World Refrigeration Day, to be launched on 26 June 2019, aims to raise awareness among the wider public about the importance of refrigeration technologies in everyday life.
Refrigeration is essentially a question of temperature and, as such, it only seems natural to celebrate the field on the birthday of the pioneer at the origin of the international unit of temperature, Lord Kelvin (Sir William Thomson) – born 26 June 1824.
With increasing global stakes at hand, over the past years refrigeration has come to take a leading role at the heart of international affairs.
The inauguration of a World Refrigeration Day would not only be an ideal way to recognise the many historical achievements of the industry, but also a means to anticipate and overcome together the challenges we face. ...
Click here for more information.

New International Journal of Refrigeration service for IIR members - Access the complete archives of the International Journal of Refrigeration (IJR) online. Designed with IIR members in mind, this new and practical electronic subscription gives members substantial advantages:
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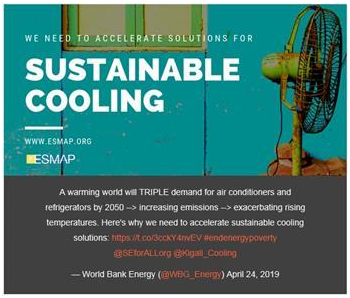
- Consult the research highlights overview of articles in volumes from 2012 onwards.

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

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

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

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



Shecco: A conversation with Professor Predrag (Pega) Hrnjak, director of the Air Conditioning and Refrigeration Center, University of Illinois at Urbana-Champaign, and owner/founder of research and consulting business, "Creative Thermal Solutions (CTS)", which he founded in 2003, to query him about his recent work and the state of natural refrigerants. At CTS and the university, Hrnjak has been engaged in seminal research on a wide range of natural refrigerant projects, from low-charge ammonia to ejectors for transcritical $CO_2$to some of the early CO_2 mobile air conditioning systems.

Click here to access recent OzoNews Issues

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UN environment

Multilateral Fund for the Implementation of the Montreal Protocol