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Dear Readers,

We are re-issuing this edition of OzoNews as it included an article which contained incorrect and very out of date information (*Article 11. Ozone hole over city for first time*). The reason for this was that the article from a particular source indicated its publication date as 2018, whereas it was actually an old article.

We have removed the article from this updated version of OzoNews.

We would like to emphasise that on 10 September 2018, NASA reported the size of the ozone hole as 23 million km<sup>2</sup> in area (not 30 million square km as was suggested in the erroneous article).

We apologise for any confusion caused.

# Global

## 1. Little-noticed treaty could help delay climate catastrophe



▲ In Vincent Etoka, Rwandan government minister, hits a hammer to symbolise the adoption of the Kigali amendment on 15 October 2016. Photograph: Cyril Ntegyira/AFP/Getty Images

2016 Kigali amendment on hydrofluorocarbons could reduce warming by a small but crucial 0.5C

From the beginning of next year, a new global pact will take effect that could have a profound impact on climate change, cutting harmful greenhouse gas emissions by amounts that could help stave off some of the worst impacts predicted by the IPCC.

This little-noticed treaty has nothing to do with the Paris accord, the United Nations Framework Convention on Climate Change (UNFCCC) negotiations that have dragged on since 1992, or energy sector emissions, which have resumed their rise.

The Kigali amendment, which was agreed on 15 October 2016 and comes into force on 1 January [2019], will drastically reduce hydrofluorocarbons (HFCs). These heat-trapping gases are the byproduct of industrial processes such as refrigeration and can be eliminated from those processes by re-engineering. The amendment comes under the Montreal Protocol, the world's most successful international environmental treaty, which aims to stop the depletion of the ozone layer.

HFCs are prime examples of short-lived climate pollutants (SLCPs), a range of chemicals that are spewed into the atmosphere by human activities and contribute to global warming. While attempts to reduce climate change have rightly focused on the main greenhouse gas, carbon dioxide, mostly produced from our use of fossil fuels, these other substances have been largely ignored.

Experts estimate that cutting down on SLCPs could reduce global warming by as much as 0.5C. That would not be enough to avoid the worst effects of climate change if we continue to burn fossil fuels, but it could buy humanity some much-needed time while carbon emissions are brought under better control.

“The only way to slow near-term feedbacks [which could drive climate change past tipping points] in the 15- to 20-year window before we lose control to runaway warming is to cut the SLCPs, which can provide considerably more avoided warming at mid-century than cuts to carbon dioxide can provide,” said Durwood Zaelke, founder of the Institute for Governance and Sustainable Development and a reviewer of the IPCC report on the effects of 1.5C warming. “In fact, [they could provide] two to six times more [than carbon cuts].”

He said the IPCC had recognised their importance. “This is the IPCC’s first acknowledgement that cutting the super pollutants – black carbon, methane, HFCs – is essential for keeping the climate safe. These cuts are the fastest way to slow down warming while we decarbonise the energy system and learn how to remove carbon from the atmosphere at the scale we need.”

Many SLCPs break down relatively quickly in the atmosphere, unlike carbon dioxide, which can stick around for a century. But while they are present, they can have a greater impact: some HFCs have a global warming potential more than 11,000 times greater than that of carbon dioxide.

The Kigali amendment, by avoiding the equivalent of up to 90bn tonnes of CO<sub>2</sub> by 2050, could be “perhaps the single most significant contribution to keeping warming well below 2C, aiming for the still safer 1.5C,” Zaelke told the Guardian.

**The Guardian, 8 October 2018, By: Fiona Harvey Environment correspondent**

## 2. \$45 Billion commercial refrigeration equipment market - Global forecast to 2023

COMMERCIAL REFRIGERATION EQUIPMENT MARKET BY PRODUCT TYPE, REFRIGERANT TYPE (FLUOROCARBONS, HYDROCARBONS, INORGANICS) APPLICATION (HOTELS & RESTAURANTS, SUPERMARKETS & HYPERMARKETS), AND REGION (EUROPE, APAC, NORTH AMERICA) - GLOBAL FORECAST TO 2023



The global commercial refrigeration equipment market is projected to grow from an estimated USD 33.58 billion in 2018 to USD 45.45 billion by 2023, at a Compound Annual Growth Rate (CAGR) of 6.2%, from 2018 to 2023.

The commercial refrigeration equipment market is expected to shift towards natural refrigerant-based systems because of the potential for large energy savings, and implementation of stringent regulations worldwide for phasing out ozone-depleting substances, such as hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs).

The demand for NH<sub>3</sub>/CO<sub>2</sub> cascade systems is also slated to go up gradually due to the advantages they offer for food processing and low-temperature distribution facilities. These benefits include low operating costs (as they use less energy per ton of refrigeration compared to other systems), lower capital and compliance costs, optimal food quality, and increased throughput.

The hotels and restaurants segment is projected to be the largest application segment of the commercial refrigeration equipment market from 2018 to 2023. The advanced commercial refrigerators provide for practical designs to capture the attention of customers at any such point of sale.

The fluorocarbons segment is estimated to be the largest refrigerant type segment of the commercial refrigeration equipment market in 2018. Fluorocarbons are chemical compounds comprising carbon, hydrogen, chlorine, and fluorine as their major constituents. However, not all fluorocarbons may consist of both chlorine and fluorine atoms. The applications of these refrigerants are in refrigerators (domestic, transport, and commercial) and large-scale refrigerators (supermarket/ hypermarket). Fluorocarbons are further sub-divided into three types - HFCs, HCFCs, and HFOs.

The Asia Pacific is expected to be the largest market of commercial refrigeration equipment during the forecast period. The increasing population in the region, improving economic conditions, such as rising GDP & disposable incomes, and a booming consumer appliances sector have led to growth in the commercial refrigeration equipment in the region. In addition, the growth of the commercial refrigeration equipment market in this region is fueled by growth in the manufacturing sector; increase in spending on private & public infrastructure development; and rapid urbanization.

### Commercial Refrigeration Equipment Market

Stringent regulations against the use of fluorocarbon refrigerants is a key restraint in the commercial refrigeration equipment market. Fluorocarbon refrigerants adversely affect the ozone layer due to which, the governments of several countries worldwide are imposing regulations to limit the use of fluorocarbon refrigerants. They have agreed to phase out the use of HCFCs and HFCs by imposing limits on their consumption. [...]

[PRnewswire, 11 October 2018](#)

## 3. Find out about 2018 World Ozone Day Country Activities



Ozone Day activities on 16 September - OzonAction is keen on highlighting your country's activities on the occasion of the 2018 World Ozone Day celebrations.

[Find out about 2018 World Ozone Day Country Activities.](#)

[Take this opportunity to share your innovative and inspiring events with the world!](#)

Please send us the related information/photos to this [email](#)

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# Africa

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## 4. Germany supports Ghana to phase out outmoded air-conditioners



The German Government is partnering Ghana, under its “Green Cooling Initiative” to reduce or phase-out all environmentally unfriendly air-conditioners that contribute significantly to global greenhouse gas emissions in the country.

The move would give way to the introduction of air-conditioners using natural hydrocarbon refrigerants, instead of those using Hydrochlorofluorocarbon, (HCFCs) and Hydrofluorocarbons (HFCs), which are known to contribute to global climate change emissions.

Experts say existing HFC air-conditioners found in Ghana and other developing countries were using outdated technologies with low energy efficiency. Along with other refrigeration and air-conditioning equipment, such gadgets also use fluorinated refrigerants that have high global warming potentials.

The partnership would, therefore, ensure the rolling out and upscaling of ozone friendly refrigeration and air-conditioning equipment under the Green Cooling Initiative (GCI), which is aimed at implementing mitigation measures that accelerate the transition to green cooling technologies in Ghana.

The GCI, being implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Environmental Protection Agency (EPA) on behalf of Germany and Ghana, respectively, had been adopted by Ghana as part of activities to ensure resilience to climate change.

This is being done under Ghana’s Intended Nationally Determined Contribution of the UN Framework Convention for Climate Change (UNFCCC). In pursuant to the partnership, GIZ on Thursday presented 380 split air conditioners (ACs) and spare parts that operate on hydrocarbon refrigerant R290 to the EPA, who, in turn, handed them over to two firms; Electroland Ghana Limited and Flexi-Space Limited, dealers in air-conditioning and electronic appliances, to be the first to deal in their importation and services. [...]

Mr Ebenezer Ampah-Sampong, the Deputy Executive Director in charge of Technical, EPA, said Ghana welcomed the introduction of hydrocarbon refrigerants to reduce and eventually eliminate her dependence on HCFCs and HFCs, which contributed to climate change.

He said the initiative would help Ghana to meet her commitment under the UNFCCC, the Montreal Protocol and the Kigali Amendment of the Refrigeration and Air-conditioners sector. Mr Ampah-Sampong explained that hydrocarbon offered very good benefits for both cost and environment, however, in view of its flammable nature, it calls for extra care during servicing and maintenance.

He said the EPA was, thus, partnering other stakeholders to train technicians and members of the Refrigeration’s and Air Conditioning Engineers Association of Ghana among others while efforts were being made to get technicians of the Refrigeration and Air-conditioners sector certified to ensure good practice.

**BusinessGhana, 1 October 2018**

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# Asia Pacific

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## 5. Pacific Islands cooperate on energy-efficient cooling under Kigali Amendment

BANGKOK, THAILAND, 2 October 2018 — Forty-seven officials from 14 Pacific Island Country governments gathered in Bangkok to identify opportunities and forge cooperation for promoting energy efficient cooling equipment in their countries and region.

The catalyst for the gathering was the recent agreement of the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. The Amendment, which will enter into force on 1 January 2019, is helping to protect the climate by phasing down the use of powerful greenhouse gases known as hydrofluorocarbons (HFCs). These gases are commonly used in air conditioners and refrigerators. During the transition to alternative gases taking place under the Montreal Protocol, countries have the opportunity to introduce more energy-efficient cooling equipment that would not only reduce carbon dioxide emissions, but also save consumers and businesses money on their electricity bills, help utilities meet ever growing needs for power, and enable governments to reduce fossil fuel imports.

The two-day “Twinning Workshop on Energy-Efficient and Climate-Friendly Refrigeration and Air Conditioning” was organized from 1-2 October in Bangkok by UN Environment Programme’s OzonAction Branch and United for Efficiency initiative, and delivered in cooperation with ASHRAE, the international engineering society. The event was supported by the Kigali Cooling Efficiency Program (K-CEP), a new philanthropic initiative that is committing US\$ 52 million to help developing countries transition to energyefficient, climate-friendly, affordable cooling solutions.

The workshop brought together two traditionally separate communities from the governments of the Pacific Islands – those responsible for managing compliance with the Montreal Protocol and those responsible for national energy policies. With their combined expertise and remits, these officials are key to transitioning global markets toward better performing cooling products that also protect the Earth’s climate.

Ms. Isabelle Louis, Deputy Director of the UN Environment Programme’s Regional Office for Asia and the Pacific, highlighted the leadership played by the Pacific Islands Countries during the negotiations of the Kigali Amendment, and noted that the agreement opens a new doorway for joint ozone-energy cooperation: “Apart from the significant contribution to combat global warming by avoiding more than 80 billion metric tonnes of carbon dioxide equivalent emissions by 2050, the Kigali Amendment will also provide opportunities to introduce more energy-efficient refrigeration and air-conditioning equipment while phasing out hydrochlorofluorocarbons and phasing down hydrofluorocarbons, which would benefit end users and energy security.”

Mr. Dan Hamza-Goodacre, Executive Director of K-CEP, stated: “Thanks UNEP for two days well spent working with energy and ozone government representatives from the Pacific to progress, better, more joined

up policy-making. The ideas were flowing, country contexts were shared and collaboration enhanced. The result: the Pacific Island Countries can further their leadership on climate change, for the benefit of their people.”

The meeting provided a platform for the national energy officials to learn more about the Kigali Amendment and for National Ozone Officers to better understand how energy efficiency considerations could be pursued alongside the refrigerant transition. The International Energy Agency and the Secretariat of the Pacific Community shared global and regional perspectives on policies for transforming cooling markets, and model programmes and policies.

The Association of Development Financing Institutions in the Pacific, K-CEP and the International Institute for Energy Conservation described options that could be considered for financing such programmes, including a new K-CEP “Cooling Technology Demonstration Fund” for the Pacific Island Countries.

Inspiring country case examples were shared by Fiji, Marshall Islands, Samoa, and Vanuatu. Important issues including sharing of the national context, engaging relevant stakeholders, and implementing model policies and programmes were covered through practical exercises and interactive discussions. Two senior trainers from the Thailand’s Office of Vocational Education Commission, Ministry of Education provided participants with a hands-on training session that compared the energy consumption of room air conditioners that employ different components and refrigerants and demonstrated the energy benefits of regular servicing and maintenance.

Overall, the workshop achieved its goal of starting a “twinning” dialogue between the Ozone Officers and energy officials and beginning the flow of information at the national level related to the energy efficiency and refrigerants nexus, the first step down the road towards realizing the goals of the Kigali Amendment.

**Contact:**

[James Curlin](#), Network and Policy Manager, OzonAction UN Environment Programme

[Brian Holuj](#), Programme Officer, United for Efficiency UN Environment Programme

**UN Environment, OzonAction, October 2018**



## **6. South Asia and South East Asia newly trained ozone officers set to implement Montreal Protocol**

BANGKOK, 29 September 2018 — Following a successful training of new National Ozone Officers from the Pacific Island Countries, UN Environment OzonAction organized a similar training for Ozone Officers from South Asia and South East Asia. The two-day training, also conducted in Bangkok, Thailand was held from 28-29 September 2018.

The newly trained Officers were from Afghanistan, Bhutan, Indonesia, Lao PDR, Maldives, Mongolia, Myanmar, Pakistan, the Philippines, Sri Lanka, Timor Leste, Thailand and Vietnam. Performance of these officers in their respective ozone units in developing projects, managing national strategies, reporting data, developing and enforcing policies, working with national and international institutions, directly or indirectly will affect the status of their countries' compliance with obligations under the treaty and the levels of the Ozone Layer protection. Also, bearing in mind that some of the countries within this region are large-mid volume consuming countries with manufacturing sectors, will likely make the work of National Ozone Units complex and challenging. Mr Zia Ul Islam, National Ozone Officer of Pakistan highlighted that, "The role and responsibilities of NOU are increasing manifold to meet the challenges of the market and national obligations to the Treaty. I thank UN Environment for providing us with this opportunity to understand and refresh our role and responsibilities as a National Ozone Office of a country."

During the training, participants received essential information about the Montreal Protocol, details about the roles, responsibilities and expectations of Ozone Officers and their teams, the activities that a National Ozone Unit needs to undertake, and the key skills required for daily operations to efficiently support the implementation of the Montreal Protocol in their countries.

The training programme was jointly delivered by UN Environment OzonAction, and representatives of the Multilateral Fund and Ozone Secretariats who were, in parallel, also attending the Network Meeting of Pacific Island Countries. A senior National Ozone Officer, Ms Miruza Mohamed from Maldives' Ministry of Environment and Energy also contributed to discussions and provided insight and knowledge from years of working as an Ozone Officer and managing an Ozone Unit.

Mr Ahmad Shoaib Noorzad from the National Ozone Unit in Afghanistan stated that, "Quality is much better than quantity! The information shared during these two days of training will definitely benefit the National Ozone Units (new and old) especially in the area of reporting and preparation of tranches." The new Ozone Officer of Lao PDR, Mr. Inthanongsone Inthavongsa, along the same line of thought said, "As I have just joined the NOU, this training came at the right time to strengthen my knowledge on the Montreal Protocol. I have acquired new information, knowledge and new experience, which would definitely support my day-to-day work. I found the interactive training method very effective and impactful especially in the area of communication and problems solving".

To address the challenges of the high turn-over of National Ozone Officers in general, OzonAction's Compliance Assistance Programme (CAP) uses a number of approaches such as, frequent communication with and mentoring for National Ozone Officers; direct support via country missions; south-south cooperation for on-the-job training etc. in addition to hands-on training workshops.

The next training for new Ozone Officers is scheduled for Anglophone Africa in 2019.

**Contact OzonAction, UN Environment:**

[Mikheil Tushishvili](#), Programme Officer, OzonAction, Paris

[Shaofeng Hu](#), Regional Coordinator, Asia and the Pacific

[Liazzat Rabbiosi](#), Montreal Protocol Officer, Asia and the Pacific

**UN Environment, OzonAction, September 2018**

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## 7. Philippines never wavered in commitment to phase out ozone depleting chemicals



Environment Secretary Roy A. Cimatu proudly announced that the Philippines has always been in full compliance with the Montreal Protocol since it ratified in 1991 the global agreement to protect the ozone layer from chemicals referred to as ozone-depleting substances (ODS).

According to Cimatu, the Montreal Protocol on Substances that Deplete the Ozone Layer is considered as one of the most successful multilateral environmental agreements in history because it enjoys the full support and cooperation of countries like the Philippines.

“The Montreal Protocol has 197 state signatories, and I can say that the Montreal Protocol owes its success to countries like the Philippines, that for three decades, has been consistently cooperative and compliant to the targets and schedules it set to phase out ODS around the world,” Cimatu said in his opening message, which read by Undersecretary Jonas Leones during the annual Technical Forum on the Promotion of Alternative Substances and Natural Refrigerants for Ozone Layer and Climate Protection held in Quezon City last Friday.

In 1987, the Philippines joined the rest of the world in adopting the landmark global agreement to protect the ozone layer by stopping the production and consumption of ODS. Four years later, in 1991, the country successfully completed the ratification of the Montreal Protocol.

Cimatu said that from 1991 to 2010, the country has fulfilled its commitment of phasing out the first batch or group of ODS in the manufacturing and servicing sectors.

In 1996, the Philippines phased out carbon tetrachloride or CTC and methyl chloroform. After three years, it ended the production and consumption of halon, a chemical compound formerly used in firefighting.

Also in 1999, the country phased out chlorofluorocarbon (CFC) variants—CFC-13, CFC-114, CFC-115—used in various industries as refrigerant, propellant, solvent and cleaning agent.

Appliances, such as refrigerators and air-conditioners, using CFC-11 were totally banned in 2005. Non-quarantine pre-shipment methyl bromide was phased out in 2009, while cars having air-conditioners with CFC-12 were prohibited to be registered since January 2010.

Cimatu said the Philippines is currently focused on phasing out the supposed last batch or group of ODS—the hydrochlorofluorocarbons or HCFCs, which phaseout schedule spans for 27 years from 2013 to 2040.

“Nevertheless, the country has made good with its implementation and has complied with the 10 percent import reduction since 2015, a target set to be achieved up to year 2019,” Cimatu said.

Every year, the Department of Environment and Natural Resources—through its Environmental Management Bureau—organizes a technical forum to give stakeholders and partners updates on the latest developments in the Montreal Protocol.

The annual forum, held recently in observation of International Day for the Preservation of the Ozone Layer, also serves as a venue to learn the status of the country’s implementation of the ODS Phaseout Program.

During the forum, experts on the field presented the different alternatives to HCFC use, particularly in refrigeration, air-conditioning, foam blowing, fire suppression and servicing.

There was also discussion on the significant development in the Montreal Protocol, which is the Kigali Amendment that was adopted by the parties to the original protocol in 2016 in the African state of Rwanda.

The Kigali Amendment aims to bring about a global phase down of powerful greenhouse gases hydrofluorocarbons or HFCs, which could also mitigate the adverse effects of climate change.

**Philippines Department of Environment and Natural Resources, 2 October 2018**



## 8. Le Conseil fédéral ratifie l'amendement de Kigali contre les hydrofluorocarbures nocifs pour le climat - Suisse



Le Conseil fédéral a ratifié l'amendement de Kigali qui régleme l'élimination des hydrofluorocarbures. La Suisse s'engage ainsi à prendre des mesures supplémentaires pour protéger le climat.

Le Conseil fédéral a ratifié mercredi l'amendement de Kigali au Protocole de Montréal. Le texte adopté en 2016 par près de 200 pays régleme l'élimination des hydrofluorocarbures partiellement halogénés (HFC), extrêmement nocifs pour le climat.

Le Protocole de Montréal, qui proscrie les substances les plus dangereuses pour la couche d'ozone, a permis de stopper l'élargissement du trou d'ozone. Les HFC, qui ont remplacé d'autres substances comme les CFC et HCFC, se comportent comme des gaz à effet de serre. Leurs effets sont plus de mille fois supérieurs à ceux du CO<sub>2</sub> sur le réchauffement climatique.

L'amendement de Kigali oblige les pays industrialisés à réduire progressivement leur consommation de 18 HFC à 15% du niveau actuel d'ici à 2036. Les pays émergents et en développement ont jusqu'à 2047 pour atteindre cet objectif.

La Suisse va réduire sa consommation d'HFC en adaptant l'ordonnance sur la réduction des risques liés aux produits chimiques, indique le Conseil fédéral. Les nouveaux appareils et installations contenant des HFC pour lesquels il existe, selon l'état de la technique, des solutions de remplacement feront l'objet de restrictions. La consommation intérieure d'HFC est soumise à un régime d'autorisation pour l'importation et l'exportation.

Les hydrofluorocarbures sont notamment utilisés pour la réfrigération, dans les aérosols et la climatisation. Ils font partie des six grands gaz à effet de serre, responsables de la hausse accélérée de la température mondiale: le dioxyde de carbone (CO<sub>2</sub>), le méthane (CH<sub>4</sub>), le protoxyde d'azote (N<sub>2</sub>O) et trois gaz fluorés (HFC, PFC, SF<sub>6</sub>).

**La côte, 10 octobre 2018**

## 9. Spain: a EUR 1.5 million plan to help supermarkets comply with the F-gas regulation



On September 8, 2018, the Spanish government has approved the Royal Decree 1114/2018 which plans to release EUR 1.5 million to help supermarkets to convert or to replace their refrigeration system in order to comply with the F-gas regulation. This regulation imposes a ban on high global warming potential (GWP) refrigerants in new commercial centralised refrigeration systems of 40 kW or more from January 1, 2022. It bans the use of refrigerants with a GWP of 150 or more, except the primary circuit of cascade systems where refrigerants with a GWP of less than 1500 may be used.

The purpose of this Royal Decree is to establish the regulatory bases for the direct granting of subsidies for the substitution or the conversion of the refrigeration systems in supermarkets. It is estimated that of the 5,000 commercial refrigeration installations in Spain, just over 100 (2% of the total) have refrigeration plants that comply with the F-gas regulation. The refrigeration facilities that benefit from the subsidies regulated under this decree must meet the following requirements:

Refrigeration installations must not contain fluorinated greenhouse gases with a GWP equal to or greater than 150, except in the primary refrigerant circuits of cascade systems according to the definition of primary refrigerant circuits of the cascade systems established in article 2.38 of Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006 where fluorinated greenhouse gases with a GWP lower than 1500 may be used. In all cases, 100% of the surface of frozen furniture and 70% of the linear meters of refrigerated furniture that cool at a temperature equal to or lower than 6°C installed in the commercial refrigeration establishment must be closed, either by the installation of doors or covers. Within this percentage of 70%, the linear meters of refrigerated furniture corresponding to the assisted sale of food, as well as autonomous refrigerated furniture, will

not be considered.

The new installation must have more than 40 kW of installed cooling capacity.

The scheme will be financed by Spain's PIMA Cold Environment Promotion Plan, which is fed by income from auctions of carbon credits.

**See also >>>** [Aprobado el Plan PIMA FRÍO; subvenciones para instalaciones de refrigeración basadas en tecnologías alternativas a los gases fluorados de alto PCA](#)

**International Institute of Refrigeration, September 2018**

## 10. Les députés adoptent une fiscalité incitative sur les HFC - France



Dans le plan climat présenté par Nicolas Hulot en juillet 2017, le gouvernement s'était engagé à introduire une fiscalité incitative sur les puissants gaz à effet de serre que sont les hydrofluorocarbures (HFC).

Les députés de la commission du développement durable, saisie pour avis, ont adopté ce 3 octobre un amendement qui va dans ce sens dans le cadre du projet de loi de finances pour 2019 (PLF 2019). Cet amendement prévoit un dispositif de type "bonus-malus" avec deux volets, explique son auteure, la députée LREM Laurianne Rossi : une taxe progressive prélevée à compter du 1er janvier 2021 sur les producteurs et importateurs d'HFC, d'une part, un mécanisme de suramortissement incitant les entreprises à investir dans des machines frigorifiques utilisant des fluides à moindre impact pour le climat, d'autre part.

"Cette taxe vise dans un premier temps les installations fixes uniquement", explique Mme Rossi, le secteur des transports frigorifiques étant caractérisé par de faibles marges et une forte exposition à la concurrence internationale. Les usages médicaux des HFC, notamment comme gaz propulseurs dans les inhalateurs-doseurs, sont également exemptés car ils ne sont pas substituables. Le taux de la taxe est fixé à 15 euros par tonne équivalent CO<sub>2</sub> (€/teqCO<sub>2</sub>) en 2021, 22 €/teqCO<sub>2</sub> en 2022, 30 €/teqCO<sub>2</sub> en 2023 et 45 €/teqCO<sub>2</sub> en 2024.

Quant au suramortissement, dont le montant est fixé à 40%, il pourra notamment s'appliquer "aux industriels de l'agroalimentaire et aux grandes surfaces", explique la députée. Le PLF 2019 doit être examiné par la commission des finances, saisie au fond, à compter du 9 octobre et en séance publique à partir du 15 octobre.

**See also >>>**

- [Key parliamentary committee rejects French HFC tax](#)
- [French parliament pushes for HFC tax adoption](#)

**ActuEnvironnement, 3 Octobre 2018, Par: Laurent Radisson Journaliste : Rédacteur en Chef délégué aux marchés HSE**

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North America

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# 12. Integrating flammable refrigerants in commercial refrigeration and HVACR products

## What You Should Know about EPA Approved Alternatives

As a follow-up to its Clean Air Act of 1990, the U.S. Environmental Protection Agency (EPA) created the Significant New Alternatives Policy (SNAP), to identify and evaluate substitutes for ozone-depleting substances. Under SNAP, the EPA provides acceptable and unacceptable substitutes for different industrial sectors. For the commercial refrigeration and HVAC industries, the use of certain high-global warming potential (GWP) refrigerants and various hydrofluorocarbons (HFCs) and HFC-containing blends, including R-134a and R-404A, are prohibited.

Under SNAP, manufacturers and suppliers have to pursue more natural refrigerants, such as: ethane, isobutane, propane, hydrocarbon blend R1441A and difluoromethane (HFC-32). While more climate friendly, these refrigerants are flammable and/or explosive. This means that the industry must be prepared for new considerations as they incorporate these substances into their products.

There are a variety of considerations and decisions to be made regarding safety and performance evaluations and certifications. More importantly, incorporating flammable refrigerants into a manufacturing process requires risk assessment of the facilities and processes. Areas specified for research and development, testing, and production will potentially become explosive atmospheres, which will have a number of effects:

- Facilities will require a Hazardous Area Classification. Hazardous areas are typically classified with either a class/division or a zone system that determines requirements for protection techniques and methods for electrical. While use of these refrigerants results in a lower risk classification, these settings are still hazardous locations and will have requirements related to electrical equipment, lab design, personnel and personal protective equipment to mitigate risk.
- Reclassification will also require manufacturers to create emergency procedures in case an accident occurs. Manufacturers should also be prepared to document maintenance and repairs to the facility and equipment under hazardous locations requirements.
- Manufacturers and suppliers will need to address new considerations for shipping and handling, such as using covered or closed containers, as well as bonding and grounding them. Using approved storage and transfer equipment is also critical.
- Product maintenance instructions and labelling must be updated to account for the use of flammable refrigerants.

The EPA's efforts to protect health and safety of the environment and consumers have led to multiple changes in the industry. Requirements to use refrigerants with low GWP and ODP have meant adjustments for many manufacturers. However, understanding what the use of these refrigerants entails and preparing accordingly can ensure products meet not only EPA requirements, but consumer demand for environmentally friendly products.

**InterTek, 9 October 2018, By: Byron Horak, Director of Engineering, HVAC Performance**



## 13. Environmental refrigerant management in the Middle East



As it has been successfully done in Bahrain in April 2018, Centro Studi Galileo, in collaboration with Associazione dei Tecnici del Freddo and under commission of United Nations Environment, is conducting a series of training and certification sessions in the Countries bordering the Persian Gulf: Kuwait and Qatar.

A few selected expert technicians and trainers in the Gulf Countries have been identified to take part in the Train the Trainers and Assessors Workshops; the first will take place from 15 to 17 October 2018 in Al Kuwait, in cooperation with the Environment Public Authority of Kuwait.

The activity will be completed by drafting National Certification Schemes, in tight cooperation with UNEP and the local Governmental Authorities, for both Kuwait and Qatar, after the positive experience in Bahrain.

The expert technicians and trainers, after being certified in their Countries of origin according to the EU-517/2014, will additionally take part in a unique Master Trainer event in Italy, hosted by Associazione dei Tecnici del Freddo in Casale Monferrato, to specialise their expertise and deepen their knowledge.

**Centro Studi Galileo, October 2018**

## 14. MoE helps the industrial sector to limit ozone depletion - Egypt



### نساعد القطاع الصناعي للحد من تآكل الأوزون: البيئة

صرح الدكتور عزت لويس، رئيس وحدة الأوزون بوزارة البيئة، بأن الوزارة نفذت العديد من البرامج من أجل مساعدة القطاع الصناعي في استخدام الآيات وتكنولوجيات تعمل على الحد من تآكل طبقة الأوزون، التي ثبت علميا أنها تسبب أضرارا بالغة، مشيرا إلى أن وحدة الأوزون ووزارة البيئة تسعى لمساعدة وتشجيع القطاع الصناعي للتحويل إلى استخدام تكنولوجيات جديدة تعمل على الحد من تآكل طبقة الأوزون، والحد من ظاهرة الاحتباس الحراري، وتكون رفيقة بالمناخ ومرشدة للطاقة

وأوضح رئيس وحدة الأوزون، أن الصندوق متعدد الأطراف لبروتوكول مونتريال هو الذي يمول المشاريع التي تعمل على استخدام المواد التي تحد من تآكل طبقة الأوزون وحمايتها، مؤكدا أن هناك جهات إدارية كبرى تتعاون مع وحدة الأوزون في هذا الصدد، مشيرا إلى أن الجهات الوطنية المشاركة معهم تتمثل في وزارات الدفاع والمالية والصحة والتموين والتجارة الداخلية والكهرباء والطاقة المتجددة، والزراعة واستصلاح الأراضي

[...]

**AlbawabaNews, 10 October 2018**

# Featured



**OZONE SECRETARIAT**

- [40<sup>th</sup> Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol](#), 11-14 July 2018, Vienna, Austria

The documents for the forthcoming 40<sup>th</sup> meeting of the Open-ended Working Group of the Parties to the Montreal Protocol (11 to 14 July 2018, Vienna), and the associated workshop on energy efficiency opportunities while phasing-down hydrofluorocarbons (9 and 10 July 2018) are available on the meeting portal and mobile app.

Read/download OEWG40 [Summary](#)

[OEWG-40 Daily coverage by IISD](#)

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

## 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.

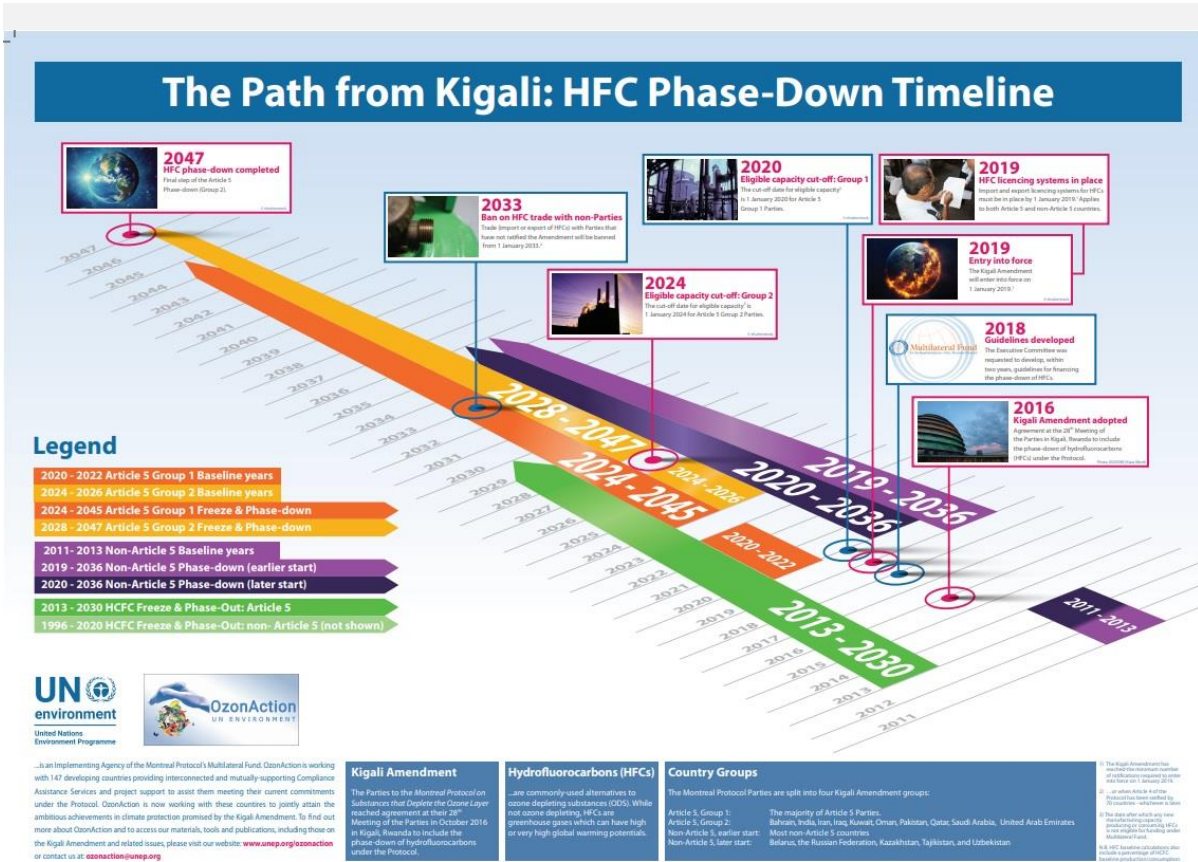
Why are the three current panels important to ozone layer protection? Each carries out assessment in its respective field. Every four years, the key findings of all panels are consolidated in a synthesis report.



## THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

- [Provisional agenda for the 82<sup>nd</sup> meeting of the Executive Committee](#)
- [Adjusted Prorated 2018-2020 business plan of the Multilateral Fund \(16 August 2018\)](#)
- [81<sup>st</sup> meeting of the Executive Committee](#), Montreal, Canada, 18 to 22 June 2018
- [Reports of projects demonstrating alternatives to HCFC technologies \(updated 81<sup>st</sup> meeting\)](#)
- [2018 Executive Committee Primer](#)

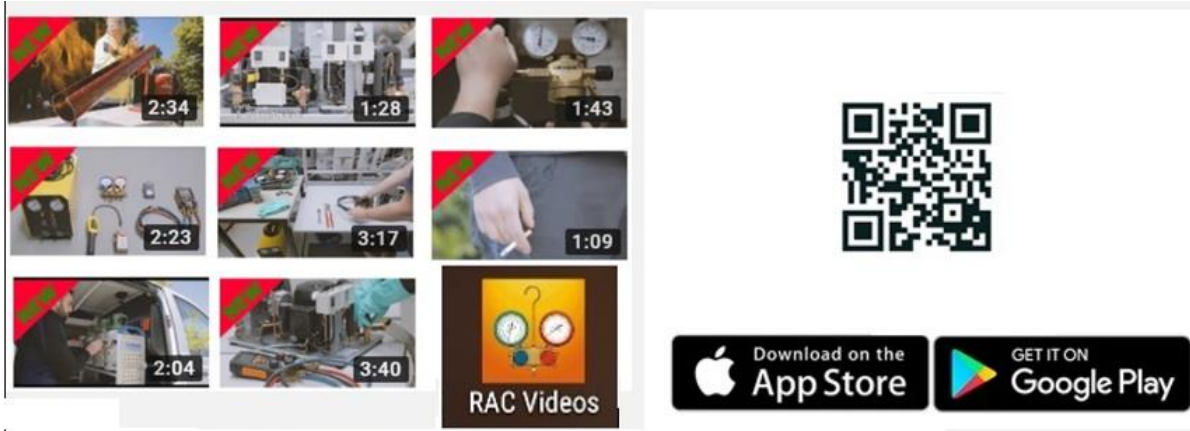
[Learn more](#)



## 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<sub>2</sub>-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<sub>2</sub>-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<sub>2</sub>-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 28<sup>th</sup> 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





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

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

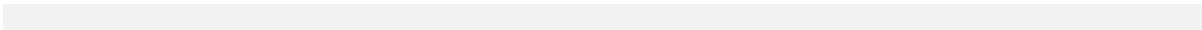
HS codes for HCFCs and certain other Ozone Depleting Substances ODS (post Kigali update).

**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 hydrofluoro-carbons (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 - 50,000 download 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)



### **OzonApp eDocs+** launched in Android Play Store and Apple Store.

This new application launched by OzonAction on February 12, includes publications, videos, fact sheets and other awareness materials to help National Ozone Units (NOUs) and other stakeholders to build their capacity to implement the Montreal Protocol in a sustainable manner and at the same time to derive climate benefits.

**OzonApp eDocs+** available in the [Android Play Store](#) and [Apple Store/iTunes](#).

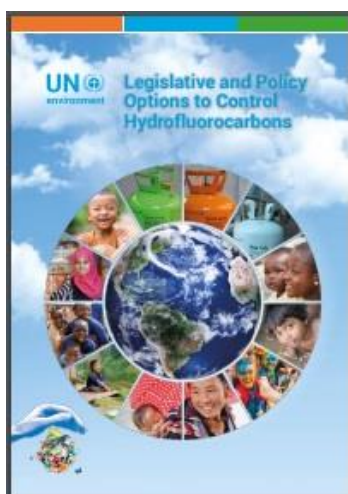
(Just search for "OzonAction", or scan this QR code)

## **Publications**



**"The Dawn of a New Refrigeration Era - The Kigali Amendment for a Brighter Future"** The New International Industria&Formazione Special Issue 2018-2019 will be launched Tuesday 16 October in Chillventa. The seventh edition of this renowned international publication, edited in cooperation among Centro Studi Galileo, United Nations Environment and the International Institute of Refrigeration after months of tight joint action, will be also presented in a world premiere at the 30<sup>th</sup> Meeting of the Parties to the Montreal Protocol (MOP-30), 5-9 November 2018, Quito, Ecuador.

**Request your free copy ahead of the upcoming MOP-30 by filling out [this form](#)**



### **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.

## Events

### 2018

- [Chillventa Nuremberg 2018](#), 16-18 October 2018, Nuremberg, Germany
- [Methyl Bromide Alternatives and Emissions Conference](#), 13-15 November 2018, Orlando, FL. USA
- [Healthcare ColDays](#), 15 November 2018, Lyon, France
- [ATMOsphere Europe 2018](#), 19-21 November 2018, Lago di Garda, Italy
- [Asia Cold Chain Show 2018](#), 28-30 November 2018, Bangkok, Thailand

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## 2019

- **Call for abstracts - 15<sup>th</sup> Cryogenics 2019 Conference**, 7-11 April 2019, Prague, Czech Republic
- **8<sup>th</sup> Conference on Ammonia and CO<sub>2</sub> Refrigeration Technologies**, 11-13 April 2019, Ohrid, Macedonia (FYROM)
- **25<sup>th</sup> IIR International Congress of Refrigeration** - 24-30 August 2019, Montreal, Canada

Click [here](#) for more information / [International Institute of Refrigeration](#)

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# Reading

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[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<sub>2</sub>-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](#)



Letter to the Editor

**Refrigerants: There is still no vision for sustainable solutions**

Risto Ciconkov

**Refrigerants: There is still no vision for sustainable solutions**

by Risto Ciconkov

Letter to the Editor, International Journal of Refrigeration

## Abstract and highlights

**Optimization, monitoring, and maintenance of cooling technology** **KIGALI**  
COOLING EFFICIENCY PROGRAM


This Knowledge Brief from the Kigali Cooling Efficiency Program, outlines the need for maintaining and servicing of cooling technology. It estimates that better optimization, monitoring, and maintenance of cooling equipment the potential to save 30Gt of CO<sub>2</sub> emissions by 2050.

**THE NEED FOR COOLING EFFICIENCY**  
Cooling is essential to health, prosperity, and the environment, underpinning some of the Sustainable Development Goals. Yet currently most cooling is energy intensive and highly polluting. Demand for cooling is expected to rise as an urgent need to not only cut pollution from existing cooling but to ensure future cooling needs are met sustainably.

**COOLING ACCOUNTS FOR 1% OF GHG EMISSIONS**  
Use of cooling technologies causes substantial global (GHG) emissions of between 3.8<sup>1</sup> and 4.7<sup>2</sup> GtCO<sub>2</sub>e per a 10% global emissions. The International Institute of Refrigeration has estimated that cooling consumes 17.2% of global electricity at 2,000 TWh a year on 2015 consumption<sup>3</sup>. Indirect emissions from electricity to power cooling technologies causes 85% of cooling emissions<sup>4</sup>. The impact of global GHG emissions from cooling equipment is projected to grow between now and 2050 as developing regions gain access to energy and the technologies. It is estimated that improving the efficiency of cooling equipment between now and 2050 can avoid for emissions of approximately 30Gt CO<sub>2</sub>e.

**OPTIMIZATION, MONITORING, & MAINTENANCE CAN REDUCE TOTAL COOLING CONSUMPTION BY 15%**  
Regularly the optimization, monitoring, and maintenance of cooling equipment results in increased energy use, lower cooling performance, and shorter equipment life. Effective optimization,

monitoring, and maintenance of cooling equipment could deliver substantial electricity savings of up to 20% (100 TWh), particularly if equipment has not been maintained for a long time, leading to electricity savings of up to 1.5 Gt CO<sub>2</sub>e.



The global risk of rising air temperatures is expected to rise 30% by mid-century (2050) to 2.5 billion units to 2050 (Carbon Energy Efficiency 2018)

**CARBON TRUST**

“**Optimization, monitoring, and maintenance of cooling technology**” outlines the need for maintaining and servicing of cooling technology. It estimates that better optimization, monitoring, and maintenance of cooling equipment the potential to save 30Gt of CO<sub>2</sub> emissions by 2050.

**Cooling as a Service (CaaS)** **KIGALI**  
COOLING EFFICIENCY PROGRAM

This brief presents a new approach to cooling – Cooling as a Service. This approach can benefit companies, governments and society at large and is based on the servitization concept which is rapidly penetrating other marketplaces.

**KEY TAKEAWAYS**  
The standard business model of delivering cooling typically involves the manufacturer, sale, use, and disposal of equipment. Higher production volumes generally support lower sales and more profit. As a result, manufacturers lack a strong incentive to enhance their own technology to improve the energy and resource use of cooling products. Alternative business models are possible – and can promote much more energy and resource efficient technologies.

CaaS is a novel service model and customers paying for the cooling they receive, rather than the physical product or subscription that delivers the cooling. Examples of CaaS include include shared cooling, where customers do not own the cooling infrastructure, and long-term rental (LTR) models, where a technology provider installs and maintains the cooling equipment, and recovers costs through periodic payments made by the customer. These payments are fixed cost per unit for the cooling service delivered (for example, dollars per tonne of refrigeration, or cubic metres of cooled air), and are based on actual usage. The payments are not dependent on the energy use with an LTR model but agreed in advance as a function of actual usage. This makes it easier and more transparent for the client. In a broader sense, customers may also view some LTR models as a form of CaaS as they pay for multiple cycles of on-going service payments and avoid the upfront capital costs of cooling equipment.

**KEY TAKEAWAYS**  
At the global scale, the anticipated explosion of demand for cooling in developing countries, because more prosperity, and an urbanisation and planetary warming increase will lead to a rapid escalation of energy and resource use from cooling. The 50 companies that global annual energy use from space conditioning areas will triple to amount to 2,200 TWh in 2050 under business as usual (BAU) scenario (IEA, 2018). There is an urgent need to reduce the energy intensity and cut pollution from cooling, and to ensure efficient cooling systems are affordable to all those who need them.

CaaS models benefit customers through lower energy and maintenance costs, the absence of upfront capital investment, industry leading equipment, and a transparent and predictable pricing structure. The model effectively turns capital expense into an operational expense for clients, freeing up capital for other investment purposes. The model also reduces the potential technology risk for the client, as they are not required to invest in the technology directly, and are not exposed to equipment obsolescence.

CaaS gives technology providers a design incentive to increase their own profits by reducing their products' operating costs through innovative, leading concepts. LTR transaction between manufacturers and users, better cooling technology providers are already offering CaaS to differentiated themselves in the marketplace and compete against low quality, inefficient and less cost cooling solutions.

CaaS can also increase the likelihood that cooling equipment is effectively serviced and supported, lowering the risk of unplanned breakdowns and cooling inefficiency. Proper maintenance can deliver reliability savings up to 20% (IEA, 2018).



**CARBON TRUST**

“**Cooling as a Service (CaaS)**” presents a new service approach to cooling, which can benefit companies, governments and society at large and is based on the servitization concept which is rapidly penetrating other marketplaces.

Life Is On **Schneider Electric**

**The Different Types of Cooling Compressors**

White Paper 254  
Revision 2

by Paul Lin  
Victor Avellar

**Executive summary**  
There is much confusion in the marketplace about different compressor types and their characteristics. In this paper, each of these compressors is defined, benefits and limitations are listed, and practical applications of each are discussed. With this information, an educated decision can be made as to most appropriate compressor for a given need.

“**The Different Types of Cooling Compressors**”, A new free-to-download white paper launched by Schneider Electric.

**Introduction:** There is much confusion in the marketplace about different compressor types and their characteristics. In this paper, each of these compressors is defined, benefits and limitations are listed, and practical applications of each are discussed.

With this information, an educated decision can be made as to most appropriate compressor for a given need.

**Conclusion:** Various compressor types are appropriate for different uses, and no single compressor type is ideal for all applications. The intent of this paper is to contrast the benefits and limitations of the various compressor

types on the market today.

Significant differences in compressor designs offer theoretical and practical benefits for different purposes. Nevertheless, the compressor is just one of four basic components of an air conditioner. The compressor type, cooling system configuration (e.g. condenser, evaporator), control, etc. will determine the ultimate performance achieved in a particular application.

For more information on the types of cooling systems, see *White Paper 59, The Different Technologies for Cooling Data Centers*.

## 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" as part of the 30<sup>th</sup> Anniversary of the Montreal Protocol celebration.

**The new website was launched during the 29<sup>th</sup> Meeting of the Parties to the Montreal Protocol, Montreal, Canada, 20-24 November 2017.**

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 men and women 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:

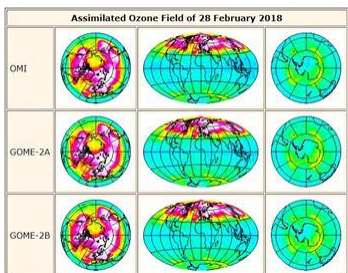
- Immediate and permanent access to the latest research and to IJR archive
- Access the latest articles as soon as they become available online.
- Browse, search and read each one of the nearly 4,500 papers since Volume 1, Issue 1.

- Unlimited access to seminal contributions to the field of refrigeration dating back to 1978.

- Keep up-to-date with subscriptions to customized e-alerts on New Volumes, Topics and saved Searches.
  - Enhanced content and functions
  - Easily export references, citations and abstracts.
  - Print, download or share articles with colleagues or peers.
  - See which papers, published in Elsevier or elsewhere, have cited any selected article.
  - 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](mailto:info@area-eur.be)



**TEMIS -- Near-real time global ozone field.** The in near-real time delivered total ozone columns, derived from satellite observations, are input to a data assimilation program which provides global ozone fields for today and a forecast for the coming days.



**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.



Current and previous OzoNews Issues, are available from  
OzonAction website

Download a [PDF](#)



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If you have questions or comments regarding any news item, please contact directly the source indicated at the bottom of each article.

Prepared by: Samira Korban-de Gobert, OzonAction

Reviewed by: Shamila Nair-Bedouelle, Head OzonAction Branch, and Ezra Clark, OzonAction

If you wish to submit articles, invite new subscribers, please contact:

Samira Korban-de Gobert,

Tel. (+33) 1 44.37.14.52,

[Samira.deGobert@uneenvironment.org](mailto:Samira.deGobert@uneenvironment.org)



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