

OzoNews

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

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GLOBAL

1. **Kigali Amendment latest ratification**
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Congratulations to the latest country which have ratified the Kigali Amendment:

Mongolia, 27 July 2022

At the Twenty-Eighth Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, held in Kigali from 10 to 15 October 2016, the Parties adopted, in accordance with the procedure laid down in paragraph 4 of article 9 of the 1985 Vienna Convention for the Protection of the Ozone Layer, a further

amendment to the Montreal Protocol as set out in Annex I to the report of the Twenty-Eighth Meeting of the Parties (Decision XXVIII/1).

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

United Nations Treaty Collection

Image: UN Treaty Collection website

2. Global cooperation to protect the ozone layer can ensure a better future for us all

As the Montreal Protocol to Protect the Ozone Layer turns 35 on Friday, World Ozone Day, the United Nations has said that continuing the level of cooperation that led to the treaty's adoption and success is just what is needed to protect life on Earth, end the climate crisis and ensure a brighter future for us all.

Hailing the Montreal Protocol as the most successful environmental treaty ever, the UN Environment Programme (UNEP) said the instrument's adoption ended one of the biggest threats ever to face humanity as a whole: the depletion of the ozone layer.

"When the world found out that ozone-depleting gases used in aerosols and cooling were creating a hole in the sky, they came together," the agency said in a press statement, adding: "They showed that multilateralism and effective global cooperation worked, and they phased out these gases. Now the ozone layer is healing, allowing it once again to shield humanity from the sun's ultraviolet radiation."

Catastrophe averted

This action has protected millions of people from skin cancer and cataracts over the years since. It allowed vital ecosystems to survive and thrive. It safeguarded life on Earth. And it slowed climate change: if ozone-depleting chemicals had not been banned, we would be looking at a global temperature rise of an additional 2.5°C by the end of this century.

"This would have been a catastrophe," said UNEP.

In his message on World Ozone Day, UN Secretary-General António Guterres said the Protocol was a success because, when science discovered the threat, we all faced, governments and their partners acted.

"The Montreal Protocol is a powerful example of multilateralism in action. With the many problems facing the world – from conflicts to growing poverty, deepening inequality and

climate emergency – it is a reminder that we can succeed in working together for the common good,” said the UN chief.

The Protocol has much more to give

Mr. Guterres said that the Montreal Protocol has already contributed to tackling the climate crisis, and indeed, by protecting plants from ultraviolet radiation, allowing them to live and store carbon, it has avoided up to an extra 1 degree Celsius of global warming.

“The Protocol’s work to phase out climate-heating gases and improve energy efficiency through its Kigali Amendment can further slow climate disruption. But, only by mirroring the cooperation and speedy action of the Montreal Protocol elsewhere can we stop the carbon pollution that is dangerously heating our world. We have a choice: collective action or collective suicide,” he warned.

UNEP said that the Montreal Protocol has much more to give. Under the Kigali Amendment nations have committed to phase down hydrofluorocarbons – a move that could avoid up to 0.4°C of global temperature rise by the end of the century. The Protocol and its Amendment are helping the world adopt climate friendly and energy-efficient cooling technology.

What does this mean for humanity? UNEP said that as the international community continues to protect the ozone layer, the Protocol will continue to safeguard us and all life on Earth.

“It also means a cooler planet as more countries ratify the Amendment. It means more people being able to access vital cooling technology without further warming the planet. It also means the Protocol continuing to send a clear and lasting message: global cooperation to protect life on Earth is our best chance at a brighter future for everyone,” concluded UNEP.



[The Unite Nations, News, 16 September 2022](#)

Image: UN website

3. While the ozone layer is healing, pitfalls remain

In 1987, the world came together to sign the Montreal Protocol, a global agreement to protect the Earth’s ozone layer. The accord was designed to phase out a host of

chemicals, such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), that were creating a continent-sized hole in the ozone layer above Antarctica.

Today, the ozone layer is healing, shielding the planet from the potentially devastating effects of ultraviolet radiation.

But while it may have slipped from the headlines, the ozone layer still remains under pressure, said Meg Seki, Executive Secretary of the Ozone Secretariat under the United Nations Environment Programme.

“People tend to assume that the ozone hole is history, that we’ve done our job. Actually, we have a lot of challenges still ahead of us.”

In the lead up to the International Day for the Preservation of the Ozone Layer, which falls on 16 September, we spoke with Seki about the perils facing the Earth’s sun shield and whether the Montreal Protocol can be a template for fighting climate change.

The Montreal Protocol has been called one of the most successful global environmental agreements in history. Why?

Meg Seki (MS): The Montreal Protocol is so significant because it successfully tackled an emerging environmental catastrophe. When scientists alerted the world that there was a gaping hole in the ozone layer due to man-made chemicals emitted into the atmosphere, political and environmental leaders came together to address the problem. Today, more than 99 per cent of ozone-depleting substances have been phased out and the ozone layer is on a path to recovery.

What is the size of the hole in the ozone layer now compared to 1987?

MS: Because of the annual variability, the size of the hole goes up and down depending on the temperature in the stratosphere. So, we cannot predict this in advance but there’s a gradual but definite trend towards recovery.

How long until the hole is no more?

MS: Scientists estimate that the hole in the ozone layer will be no more by the 2060s. However, it’s very difficult to talk about complete recovery because the atmosphere itself is very different to what it was when there was no ozone depletion. Greenhouse gases, temperature changes and global warming all affect the dynamics and chemical processes in the atmosphere, impacting the recovery process. In other parts of the stratosphere, the ozone layer recovery is expected to be earlier.

Does climate change threaten to undo some of the progress we’ve made in repairing the ozone layer?

MS: This is a very complex issue. Ozone-depleting substances controlled by the Montreal Protocol are potent greenhouse gases that cause climate change, but we have managed to control and phase out their emissions. Climate change itself is causing changes in atmospheric circulation and temperature, which affect the depletion and recovery of the ozone layer.

The presence of greenhouse gases, such as nitrous oxide, and other pollutants in the stratosphere are also impacting ozone layer depletion. The Scientific Assessment Panel, one of three assessment panels under the Montreal Protocol, is constantly reviewing the state of the ozone layer and monitors the trends of ozone depleting substances and other

gases in the atmosphere. The panel also looks into the linkages between stratospheric ozone changes and climate.



There are other challenges, too. The Montreal Protocol includes exemptions for some chemicals that may deplete the ozone layer. Other known ozone-depleting substances, like nitrous oxide, aren't covered at all. Is it fair to say that the ozone layer isn't out of the woods yet?

MS: Yes. Because of the Montreal Protocol's success there's been a lot of news about the ozone layer healing itself, which is great. But people now assume that the ozone hole is history, that we've done our job. Actually, we have a lot of challenges still ahead of us. First and foremost, we have the Kigali Amendment implementation to phase down HFCs and address energy efficiency improvements, especially in the cooling sector. Parties are also phasing out the remaining HCFCs and reducing the exempted uses where they can. Parties have also been looking into the sound destruction of banks of ozone-depleting substances that remain in end-of-life cooling equipment and buildings. Furthermore, although, nitrous oxide is not controlled by the Montreal Protocol parties are interested in understanding the magnitude of its impact on the ozone layer to see if any action needs to be taken.

How has the Montreal Protocol contributed to biodiversity?

MS: It's clear that protecting the ozone layer meant protecting all life on Earth: ecosystems, human health, agriculture, wildlife – you name it we protect it. Without the ozone layer, too much harmful UVB radiation would have reached the Earth's surface. This would have been bad news. Increased exposure to ultraviolet radiation can cause skin cancer and eye cataracts, and damage crops, plants, and micro-organisms, affecting ecosystems and food chains.

What lessons from the Montreal Protocol can be applied to tackling climate change?

MS: Ozone depleting substances were widely used in many sectors of our economy – cooling, electronics, firefighting, aerosols, medicine... and as fumigants in agriculture. Innovative measures and mechanisms were needed to ensure that the ozone-depleting substances that had become so essential to human life could be eliminated without disrupting the functioning of society.

[The United Nations Environment Programme, Ozone Secretariat, 15 September 2022](#)

Image: UNEP, Ozone Secretariat website

4. Scientific article suggesting new metric to measure ozone layer recovery

An article on a new tool to measure ozone recovery has been published in [Nature](#). The Integrated Ozone Depletion (IOD) metric is being suggested as a tool to assess the effects of ozone-destroying substances and their impact on the recovery of the ozone layer.



The ozone depletion potential of atmospheric compounds has been a key metric in measuring the ability of those chemicals to deplete stratospheric ozone and guiding the phase-out of the most highly depleting substances under the Montreal Protocol. A recent scientific study by a team of researchers from the National Centre for Atmospheric Science and the University of Cambridge suggests that the current recovery phase in monitoring the success of the Protocol might require additional metrics.

The article suggests that rather than measuring the “delay in ozone return” to some previous value, often taken to be the 1980 value, the IOD metric may be used. IOD provides a straightforward means of calculating the impact of any new emissions, regardless of their size, on the ozone layer based on the strength of the particular emission, how long it will remain in the atmosphere, and how much ozone is chemically destroyed by it. The study argues that the IOD could provide a useful complementary metric of the impact of specific emissions of ozone-depleting substance for both policy makers and scientists.

Continued vigilance and monitoring of controlled substances (and those unregulated by the Protocol i.e., short-lived substances), as well as the need to address any gaps in atmospheric monitoring for early detection of emissions and their sources is critical to successful ozone depletion mitigation. This was recently reaffirmed when in 2018 scientists alerted the world of an unexpected increase in emissions of a banned chlorofluorocarbon (CFC), CFC-11. Such an increase would have been detrimental to the ozone layer had this gone on unchecked.

35 years since the adoption of the Protocol, it is recognised that threats to ozone layer and its recovery, including breaches of the Protocol and emissions of unregulated ozone-depleting substances, remain. As ozone layer recovery enters a new phase, scientific assessments of the state of ozone depletion and recovery are key.

[The United Nations Environment Programme, Ozone Secretariat, 13 September 2022](#)

Image: UNEP, Ozone Secretariat website

5. Know the Rules, specific uses of controlled substances

Uses excluded from the calculation of production and consumption under the Montreal Protocol

FEEDSTOCK USES

> Excluded from the calculation of production and consumption given the chemical transformation of feedstock in chemical processes and insignificant quantities originating from unreacted feedstock. Insignificant quantities originating from unreacted feedstock are not covered by the definition of a controlled substance ([decision IV/12](#)).

> Deducted from the amount of controlled substances produced ([Art. 1](#))

1- In exporting countries: not included in the calculation of "production" or "consumption" ([decision VII/30](#))

2- In importing countries: not included in the calculation of "consumption" ([decision VII/30](#))

Reporting requirements: Importing countries are required to report on the volumes of controlled substances imported for feedstock uses ([Art. 7.3](#))

QUARANTINE AND PRE-SHIPMENT (QPS)

> Excluded from the calculation of production and consumption of methyl bromide ([Art. 2H](#) and [Art. 5](#))

- Reporting requirements: Each party is required to report on the annual amount of methyl bromide used for QPS ([Art. 7.3](#))

Quarantine: Applications to prevent the introduction, establishment and/or spread of quarantine pests (including diseases), or to ensure their official control ([decision VI/11](#))

Pre-shipment: Non-quarantine applications applied within 21 days prior to export to meet phytosanitary or sanitary requirements of the importing or exporting country ([decision XI/12](#))

PROCESS AGENT USES

> Excluded from the calculation of production and consumption.

> Conditions for such exclusion are set out in [decision X/14](#)

> Insignificant quantities of controlled substances originating from process agent uses are not covered by the definition of a controlled substance ([decision IV/12](#))

Reporting requirements: Each party is required to report on their use of controlled substances as process agents, the level of emissions from those uses, the containment technologies, production or imports for those uses ([decision X/14](#)). Annual reporting



obligation is not applicable once a party informs the Secretariat they do not use controlled substances as process agents until they start doing so ([decision XXI/3](#))

Exempted uses under the Montreal Protocol

ESSENTIAL USES

Exemption process

- 1- Parties submit nominations annually by a set deadline.
- 2- Nominations are evaluated by TEAP and relevant TOCs, based on adopted criteria and procedures
- 3- Following TEAP's recommendations, the MOP considers the nominations and approve essential use exemptions to produce or import specific quantity of a controlled substance, for a specific time period
 - > The Montreal Protocol permits production or consumption of phased-out substances under Articles [2A-2G](#), [Article 2I](#) and [Article 5](#) when deemed necessary to satisfy uses agreed by the parties to be essential
 - > Criteria and conditions for authorizing essential use are set out in decision IV/25, supplemented by several decisions on procedures and requirements

Reporting requirements: The controlled substance produced or imported for the authorized essential use must be reported through a reporting accounting framework, including information on the quantities acquired, used and remaining as stocks ([decision VIII/9](#))

CRITICAL USES

Exemption process

- 1- Parties submit
- 2- nominations annually by a set deadline Nominations are evaluated by the MBTOC, based on adopted criteria and procedures
- 3- Following TEAP's recommendations, the MOP considers the nominations and may approve critical use exemptions
 - > The Montreal Protocol permits, under [Article 2H](#) and [Article 5](#), the level of production or consumption of phased-out methyl bromide deemed necessary to satisfy uses agreed by the parties to be critical. Criteria and conditions for authorizing critical use are set out in [decision IX/6](#)
 - Reporting requirements: parties are required to submit, together with their nominations, information on the production and consumption of methyl bromide for the authorized in an accounting framework report including information on production, imports, exports, and quantities of existing stocks ([decision Ex.I/4](#), [decisions XVI/6](#))

LABORATORY AND ANALYTICAL USES

- > This global exemption mechanism permits laboratory and analytical uses which do not have alternatives. The conditions applied are set out in decision VI/9
 - > TEAP reviews annually the development and availability of alternatives and report to the parties, which can decide to remove specific uses from the global exemption if suitable
-

The world responded quickly.

"The same month we were in southern Chile flying into Antarctica, in Montreal the Montreal Protocol was being signed," he said. "And it was basically signed without knowing for sure what was causing the Antarctic ozone hole."

The new agreement was not only a leap of faith as far as the science was concerned, but it had attributes that have never been replicated in any subsequent climate treaty despite far higher levels of scientific certainty.

The treaty is universal with 197 member countries. It is legally binding with penalties for countries that flout its provisions. And it is fully funded, meaning that poorer countries that might not have been able to meet its targets to phase down chemicals received assistance from richer ones.

"There's no other forum that has those three dimensions," Fahey said, noting the 2015 Paris Agreement on climate change relies on voluntary commitments with no penalties for breaking them.

"Probably the underlying problem with the climate change situation is we don't have such a forum," he said.

Fahey said there was some understanding among scientists from the start that CFCs played a role in driving climate change as well as depleting the ozone layer. But that role was clarified by a scientific study that he and four other scientists published in 2007, which looked at the "worlds avoided" by stemming the growth of the chemicals.

The report showed that without the Montreal Protocol, CFC use would have ballooned. Under a conservative scenario by 2010, the chemicals would have had a greenhouse gas content nearly equal to half the carbon dioxide emissions from all other sources. The effect on the climate would have been catastrophic.

"I think the estimates are something on the order of an extra 2 degrees by the middle of the century," said Susan Solomon, a professor of environmental studies at the Massachusetts Institute of Technology.

She noted that had the world continued on its trajectory of increasing CFC use through 2050, the consequences for the ozone layer would have threatened the health and survival of every living thing on the planet, including humans. That might have forced action, she said.

"The great news is that we avoided all of that, and we not only saved the ozone layer, we actually had a tremendous win for the climate as well," she said.

While CFCs packed the biggest punch on climate change, the hydrochlorofluorocarbons (HCFCs) that temporarily replaced them still had significant consequences for the climate. After the 2007 paper was published, parties to the Montreal Protocol quickly moved to shorten the treaty's timeline for phasing down HCFCs, an adjustment that Fahey said was the first decision made under the Montreal Protocol to reduce global warming.

HCFCs were replaced by HFCs. And HFCs, which have no effect on the ozone, were intended to be the Montreal Protocol's final destination. But they're climate super pollutants that can be thousands of times as potent as carbon dioxide.

Industry was initially resistant to the idea that HFC use would have a significant impact on climate change. But Fahey credits an industry scientist, Mack McFarland of DuPont, with changing the discussion.

“The thing that Mack understood was the growth in the developing world,” he said. “That the developing world was catching up with the developed world.”

McFarland started talking to delegates at the annual Montreal Protocol meetings about the role HFCs could eventually play in driving climate change, Fahey said.

“This became one of his main messages to not only the delegates, but to the scientists and to the technologists,” he said. “And it wasn’t extremely well-received or immediately received. And even the scientists – I being one of them – didn’t really get it, so to speak.”

But in 2009, McFarland, Fahey and the other scientists who had collaborated on the 2007 paper on the climate implications of the protocol published a paper on the effects of running the world’s air condition and refrigeration units on HFCs. And its conclusions sparked the negotiations that finally led to the Kigali Amendment’s creation eight years later.

Solomon said she was shocked when the Senate voted this week by a 69-27 margin to join the Kigali treaty. The accord took effect Jan. 1, 2019, after reaching a ratification threshold. The U.S. is the 138th country to sign on.

But Solomon said that in the 1970s and ‘80s, the U.S. led the charge on global ozone protection.

“I think the primary credit needs to go to the American people,” she said.

When ozone science was in its infancy, not long after scientists Sherwood Rowland and Mario Molina demonstrated in 1974 that CFC damaged the ozone, but before the extent of the damage was known, U.S. consumers stopped buying aerosol deodorant and hair spray.

The consequences were transformational. U.S. personal care products made up 75 percent of global CFC use in 1974. Plunging demand forced industry to seek alternatives and made the Montreal Protocol possible.

And countries that now project leadership on climate change and other issues clung to their aerosol products.

“The Europeans were actually on the other side of the negotiating table,” Solomon said. “It was us saying, ‘We should get rid of these compounds, we have substitutes, let’s move on. Let’s save the planet.’ And it was Europe saying, ‘Well, you know, we don’t really see that need the way you do.’”

Solomon also credited former President Barack Obama and former Secretary of State John Kerry with creating the geopolitical momentum that carried Kigali across the finish line.

Nor are the direct climate benefits of the protocol’s cuts in CFCs, HCFCs and now HFCs the full story.

Solomon pointed out that the protocol’s multilateral fund helped poor countries gain access to refrigeration, reducing emissions from food waste and spoilage.

NRDC’s Doniger referenced a study published [in Nature](#) last year that found that without the ozone preservation benefits of the Montreal Protocol, much less CO2 would have been absorbed over the past 35 years as the world’s biosphere disintegrated.

“The damage done to trees and other vegetation would have meant that they would have soaked up a lot less CO₂ from the atmosphere,” he said.

The *Nature* study argues that the protocol helped avoid 2.5 degrees Celsius of warming. For context, scientists have warned that the world – and especially vulnerable countries – will face catastrophic damages if warming exceeds 1.5 C.

[E&E news, 23 September 2022, By Jean Chemnick](#)

Image: E&E news website/ Patrick Cullis/NOAA via AP

7. Does turning the air conditioning off when you're not home actually save energy? Three engineers run the numbers

Hot summer days can mean high electricity bills. People want to stay comfortable without wasting energy and money. Maybe your household has fought over the best strategy for cooling your space. Which is more efficient: running the air conditioning all summer long without break, or turning it off during the day when you're not there to enjoy it?

We are a team of architectural and building systems engineers who used energy models that simulate heat transfer and A/C system performance to tackle this perennial question: Will you need to remove more heat from your home by continuously removing heat throughout the day or removing excess heat only at the end of the day?

The answer boils down to how energy intensive it is to remove heat from your home. It's influenced by many factors such as how well your house is insulated, the size and type of your air conditioner and outdoor temperature and humidity.

According to our unpublished calculations, letting your home heat up while you're out at work and cooling it when you get home can use less energy than keeping it consistently cool – but it depends.

Blast A/C all day, even when you're away?

First, think about how heat accumulates in the first place. It flows into your home when the building has less stored heat than outside. If the amount of heat flowing into your home is given by a rate of “1 unit per hour,” your A/C will always have 1 unit of heat to remove every hour. If you turn off your A/C and let the heat accumulate, you could have up to eight hours' worth of heat at the end of the day.

It's often less than that, though – homes have a limit to how much heat they can store. And the amount of heat that enters your home depends on how hot the building was to begin with. For example, if your home can only store 5 units of thermal energy before coming to an equilibrium with the outdoor air temperature, then at the end of the day you will only ever have to remove 5 units of heat at most.

Additionally, as your home heats up, the process of heat transfer slows down; eventually it reaches zero heat transfer at equilibrium, when the temperature inside is the same as the temperature outside. Your A/C also cools less effectively in extreme heat, so keeping it off during the hottest parts of the day can increase overall efficiency of the system. These effects mean there's no one straightforward answer to whether you should blast the A/C all day or wait until you get back home in the evening.

Energy used by different A/C strategies

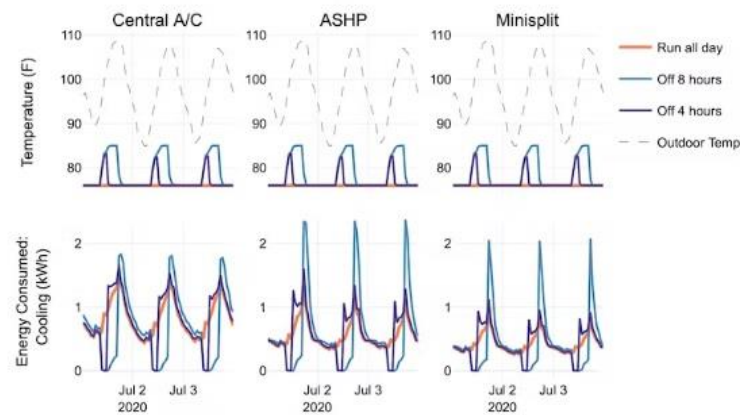
Consider a test case of a small home with typical insulation in two warm climates: dry (Arizona) and humid (Georgia). Using energy modeling software created by the U.S. National Renewable Energy Laboratory for analyzing energy use in residential buildings, we looked at multiple test cases for energy use in this hypothetical 1,200 square-foot (110 square-meter) home.

We considered three temperature strategy scenarios. One has the indoor temperature set to a constant 76 degrees Fahrenheit (24.4 degrees Celsius). A second lets the temperature float up to 89 F (31.6 C) during an eight-hour workday – a “setback.” The last uses a temperature setback to 89 F (31.6 C) for a short four-hour workday.

Within these three scenarios, we looked at three different A/C technologies: a single stage central A/C, a central air source heat pump (ASHP) and minisplit heat pump units. Central A/C units are typical of current residential buildings, while heat pumps are gaining popularity due to their improved efficiency. Central ASHPs are easily used in one-to-one replacements of central A/C units; minisplits are more efficient than central A/C but costly to set up.

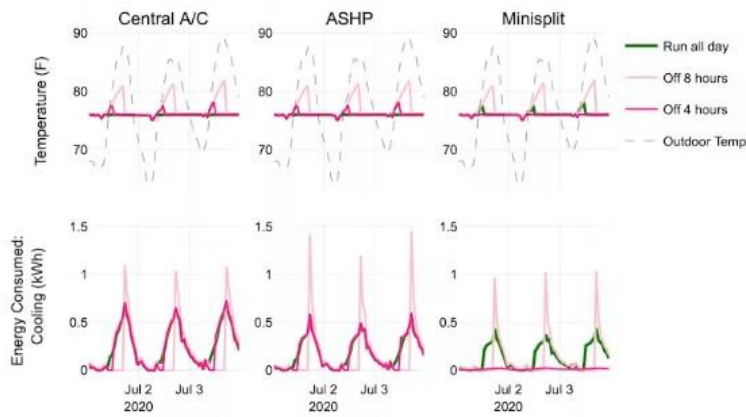
We wanted to see how energy use from A/C varied across these cases. We knew that regardless of the HVAC technology used, the A/C system would surge when the thermostat setpoint returned to 76 F (24.4 C) and also for all three cases in the late afternoon when outdoor air temperatures are usually the highest. In the setback cases, we programmed the A/C to start cooling the space before the resident is back, ensuring thermal comfort by the time they get home.

Energy consumption and temperature profiles based on A/C strategy, Arizona



Energy models can show how much energy a house will use under particular conditions – like Phoenix’s hot, dry summer weather. The researchers ran the numbers on three different HVAC technologies and three different temperature-setting strategies. Pigott/Scheib/Baker/CU Boulder, CC BY-ND

Energy consumption and temperature profiles based on A/C strategy, Georgia



The researchers used the same three different HVAC technologies and three temperature-setting strategies, but this time for a house in hot and humid Atlanta. Pigott/Scheib/Baker/CU Boulder, CC BY-ND

What we found was that even when the A/C temporarily spikes to recover from the higher indoor temperatures, the overall energy consumption in the setback cases is still less than when maintaining a constant temperature throughout the day. On an annual scale with a conventional central A/C, this could result in energy savings of up to 11%.

However, the energy savings may decrease if the home is better insulated, the A/C is more efficient, or the climate has less dramatic temperature swings.

Total annual energy use based on A/C strategy, Arizona

For three kinds of cooling system – central air conditioning, air source heat pump and minisplit – it was most efficient to turn cooling off during the eight-hour workday and then on again at the end of the day. This simulation took into account Arizona's hot but dry weather.

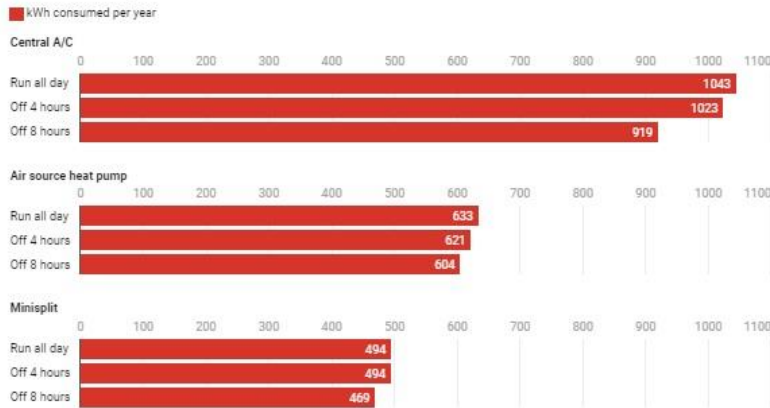


Chart: The Conversation, CC-BY-ND • Source: Pigott, Scheib, Baker/CU Boulder • [Get the data](#)

Total annual energy use based on A/C strategy, Georgia

For three kinds of cooling system – central air conditioning, air source heat pump and minisplit – it was most efficient to turn cooling off during the eight-hour workday and then on again at the end of the day. This simulation took into account Georgia's humid weather.

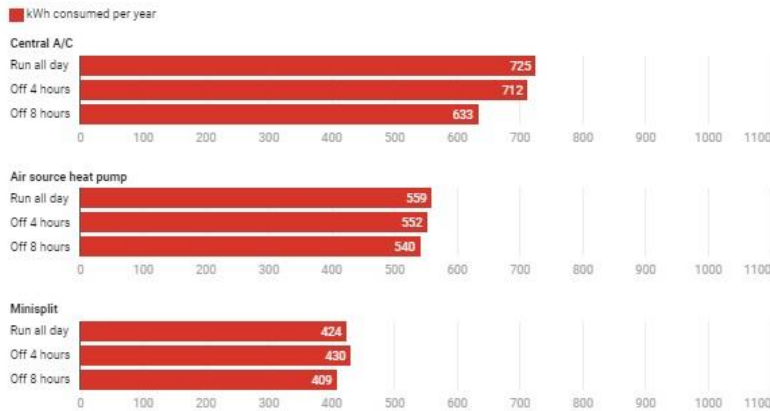


Chart: The Conversation, CC-BY-ND • Source: Pigott, Scheib, Baker/CU Boulder • [Get the data](#)

The central air source heat pump and minisplit heat pump are more efficient overall but yield less savings from temperature setbacks. An eight-hour setback on weekdays provides savings regardless of the system type, while the benefits gleaned from a four-hour setback are less straightforward.

[The Conversation, 22 August 2022, By Fabrice Rousselot, Directeur de la rédaction](#)

Image: The Conversation website

8. Sustainable cold chains: Virtual Exhibition

The virtual exhibition for sustainable cold chains aims to highlight the critical role of cold chains in ensuring food safety and security, access to vaccines, reducing global warming and preventing ozone layer depletion.

The exhibition showcases commercially available cold chain technologies for food and vaccines, mainly targeting applications and equipment with refrigeration and cooling cycles that use ozone and climate-friendly refrigerants and have enhanced energy efficiency characteristics. It also aims to promote game-changing and systemic approaches, relevant initiatives, and not-in-kind solutions to cold chains

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

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

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

Image: Sustainable cold chains website



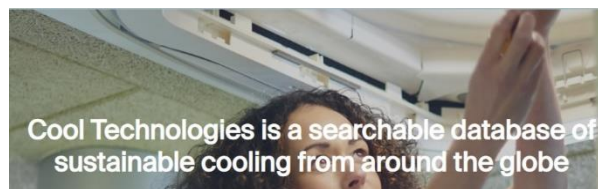
Virtual Exhibition Sustainable cold chains

See the exhibition

Submit Nomination



9. Sustainable cooling from around the globe a "Cool Technologies" searchable database



The cooling sector is an important driver of climate breakdown-the greatest threat the planet faces today. The good news is that clean cooling can offer hope in the battle against climate change as alternative sustainable technologies exist and are increasingly being deployed.

The "[Cool Technologies database](#)" is full of information on manufacturers and users of hydrofluorocarbon-free cooling equipment that rely on natural refrigerants and other sustainable cooling technologies.

The global cooling sector is changing. Developing countries are today in the process of phasing out ozone depleting hydrochlorofluorocarbons (HCFCs). They are therefore making decisions about whether to replace HCFCs with hydrofluorocarbons (HFCs) or leapfrog to climate-friendly technologies, such as natural refrigerants.

Developed countries, which already rely primarily on HFCs in their refrigeration and air-conditioning sectors, are reducing HFC production and consumption through national, regional and global legislation.

The move away from HFCs is already well underway. By understanding what is available and working well for others you can make the best choice for the future.

The Cool Technologies Database Editorial Committee comprises Greenpeace and Environmental Investigation Agency (eia).

Learn more about [Cool Technologies](#) >>>

Image: Cool Technologies website

AFRICA

10. Africa's battle to stay cool to reduce post-harvest losses and increase food security

In Africa, over 20% of the population faced hunger in 2021, while in Sub-Saharan Africa, post-harvest food losses are estimated at \$4 billion annually, enough to feed at least 48 million people, according to the UN Environment Programme.



Addressing the 2.1 billion tonnes of global food loss and waste is a planetary problem but one that requires local solutions. In Africa, one of the key measures to reduce post-harvest food losses is the expansion of sustainable cold chains, suggests the UN Environment Programme (UNEP). Cold chains are climate-controlled infrastructures helping to preserve edible products by maintaining a consistent ambient temperature.

"With Africa's economy, driven by population growth, urbanisation and food security is expected to grow tenfold to \$29 trillion by 2050; this presents a challenge and an opportunity" in accelerating the uptake of sustainable cold chain solutions in the agricultural sector, said Ziad Al Bawaliz to Salaam Gateway. Cold chains are climate-controlled infrastructures that help preserve edible products by maintaining a consistent ambient temperature. [...]

ACES ([Africa Centre of Excellence for Sustainable Cooling and Cold-Chain](#)) is a UNEP-led initiative established in 2020 by the governments of Rwanda and the United Kingdom. Its

mission is to develop and accelerate the uptake of sustainable cold chain solutions in Africa's agriculture and health sectors.

"Besides dealing with a large number of small farmers, a lack of policies, investments, awareness and technical capabilities are the main challenges," said Al Bawaliz about the difficulties of expanding refrigeration networks to prevent post-harvest losses.

According to Al Bawaliz, most small farmers cannot afford a cold chain infrastructure. What makes matters worse is that according to the World Investment Report 2022, foreign direct investments (FDI) in various sectors relevant to achieving the UN Sustainable Development Goals (SDGs), especially in food, agriculture, health and education, continued to fall in 2021. However, flows to Africa increased from \$39 billion in 2020 to \$83 billion in 2021.

"We need to have the right financial models to ensure the development of cold chain; the return on investment is viable," he said, suggesting service-based models to avoid the upfront investment.

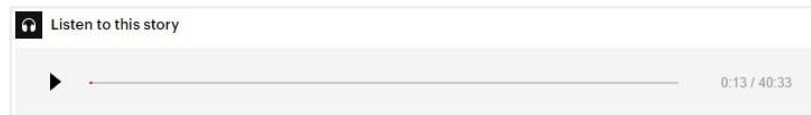
"The banks need to be part of the picture," Al Bawaliz added.

** Ziad Al Bawaliz is Danfoss's regional president for Turkey, the Middle East and Africa.*

[Salaam Gateway, 6 September 2022](#)

Images: Salaam Gateway / Shutterstock

See also >>> [Africa's Cold Rush and the Promise of Refrigeration](#). For the developing world, refrigeration is growth. In Rwanda, it could spark an economic transformation. *Article in The New Yorker, 15 August 2022, By Nicola Twilley*



WEST ASIA

11. Climate engineers: "Raghda and Iman" are the first trainers in Egypt to use environmentally friendly cooling media



مهندسات المناخ: «رغدة وإيمان» باكورة مدربي مصر لاستخدام وسائط تبريد صديقة للبيئة

تستعد مصر لتنظيم مؤتمر المناخ cop 27 بمدينة شرم الشيخ، والذي يعد من أهم المؤتمرات العالمية لحماية والحفاظ على البيئة، ويتربق العالم كل الخطوات التي تحدث في مصر لهذا الحدث الجلل، والذي يوليه العالم أهمية كبرى في الحفاظ على حياة الإنسان والحيوان والنبات ولما يخلفه التلوث من تأثيرات سلبية على اقتصاديات الدول.

وراء كل ذلك، ظهرت طاقة الشابات المصريات اللاتي استطن اخترق الأماكن والمجالات والتجارب المختلفة وصولاً إلى الصناعة والتعديل والتدريب في قطاع وسائط التبريد والتكيف، ومن بينهن أول مهندستين رانديتين في مجال التدريب لاستخدام المبردات الصديقة للبيئة.

المهندستان رغدة أحمد وإيمان شوقي من مصلحة الكفاية الإنتاجية فرع محافظة بورسعيد- التابعة لوزارة الصناعة والتجارة- صلن على تدريب ضمن مجموعة من المتخصصين والفنيين في وسائط التبريد والتي أشرف عليها وحدة الأوزون- بوزارة البيئة ووزارة القوى العاملة وهيئة التنمية الصناعية التابعة للأمم المتحدة "يونيدو"، بإشراف المهندس أحمد القرشي الاستشاري بهيئة التنمية الصناعية التابعة للأمم المتحدة، وبالتعاون مع قطاع التعليم الفني التابع لوزارة التربية والتعليم في مركز التدريب المهني بالشرابية، حيث تم عقد دورات tot وبرنامج تدريبي داعم للإجراءات والالتزامات الدولية الرامية إلى التقليل من الاعتماد على البدائل المسببة لظاهرة الاحتباس الحراري والضارة لطبقة الأوزون، إذ يهدف تدريب المدربين لتأهيل العمالة فيما بعد في استخدام وسائط التبريد الصديقة للبيئة.

يأتي ذلك وفقاً لاتفاقية الأمم المتحدة الإطارية بشأن المناخ والتي انضمت لها مصر عام 1994 ضمن 154 دولة والتي تنص على مكافحة التدخل البشري الخطير الذي يهدد النظام المناخي، وفقاً لاتفاقية مونتريال للتخلص التدريجي للمواد المستنفذة للأوزون والمواد المسببة للاحتباس الحراري.

تقول المهندسة إيمان شوقي، أنه تدريب في البداية على يد مهندسين من إيطاليا بالتعاون مع مصلحة الكفاية الإنتاجية وذلك من أجل تعديل الفريونات المستخدمة في وسائط التبريد لكي تصبح صديقة للبيئة، وكنت أنا وزميلتي "رغدة" أول مهندستين في مجال التدريب لاستخدام مواد التبريد صديقة للبيئة.

تضيف: الهدف من التبريد هو الحفاظ على البيئة وتطبيق القوانين مع الاستخدام الأمثل لوسائط التبريد بعد تغير طبيعتها، والفريونات المسببة للاحتباس الحراري وزيادة ثقب الأوزون هي R11, R12, R22، وبالفعل يتم تدريجياً إيقاف العمل بها لما تسببه من ضرر في المناخ.

أشارت إلى أنه تم استخدام R600 في جميع الثلاجات وتغيير كل الفريونات الخاصة بها، وبالفعل نجح العمل في ذلك، ليجري تدريب جميع العاملين والفنيين في مصلحة الكفاية الإنتاجية والقطاع الفني على هذه الجزئية، بالتعاون مع الوزارات والهيئات المعنية، لإيصال المعلومات الكافية والصحيحة إلى الفنيين التابعين لشركاتهم وكل شخص يعمل بيده ويقوم بتدريب غيره على الأجهزة الحديثة سواء لتغيير الوسائط أو الاسترجاع والمتابعة والمعاينة لمعرفة ما إذا كان نوع وسائط التبريد مغشوش أم صحيح، والتبريد على طريقة وطبيعة العمل على المبردات الجديدة الصديقة للبيئة.

وتؤكد: كل شخص يتم تدريبه في شركته، مصنعه، منطقة عمله هو نواة لتدريب الآخرين على طرق العمل على كيفية العمل على وسائط التبريد والتكيف.

أما المهندسة رغدة، فتوضح أن هناك بعض السليبيات التي يتم التدريب عليها لتعلم كيفية تجنبها أثناء التغيير إلى المبردات الصديقة للبيئة وهي أن بعض المواد المبردة تتسبب في الاشتعال وبها بعض المواد السامة، قد تضرر بسلامة الأشخاص، ومن المهم التدريب على تلك الجزئية، لافتة إلى تدريبها من أجل إيصال تلك المعلومات للعمال

والفنيين بالشركات والمصانع مع زميلتها إيمان شوقي لتصبحا أول سيدتين في قطاع تدريب العمال والفنيين والمهندسين على نظام تغير وسائط التبريد إلى الصديقة للبيئة.

وتضيف: «يتم التعريف بكيفية العمل على اللحام البارد والتعامل معه وإضافته إلى وسيط التبريد حيث يكون من الصعب جدا استخدامه في البداية، ولكي نتفادى أي معوقات أو نتائج سلبية وجب التدريب».

وتقول: "حضرت العام السابق كمتدربة والآن مدربة ودوري لإيصال الهدف من الدورة إلى غيري وهو كيفية التعامل الآمن مع وسائط التبريد وكيفية الإقلاع من وسائط التبريد التقليدية إلى وسائط التبريد الأخرى".

وتابعت: نعمل منذ سنوات لتنفيذ الخطة وفقاً للقوانين الموقعة عليها مصر للخفض التدريجي لاستخدام الفريونات المتسببة في تآكل طبقة الأوزون والتي سوف ينتهي العمل منها حتى تاريخ 2040 وذلك وفقاً لاتفاقية مونتريال، وذلك مع تعديل الوسائط القديمة والتخلص الآمن من المعدات القديمة أو استخدام البعض منها إذا أمكن، والتدرج في التخلص من المواد الضارة بالمناخ مثل ثاني أكسيد الكربون ومن ثم خفض التدريجي للفريونات المتسببة في الاحتباس الحراري والتي سوف نعمل عليها الفترة القادمة أيضاً".

[Dar Alhilar, 21 September 2022](#)

Image: Dar Alhilar website

NORTH AMERICA

12. U.S. Ratification of the Kigali Amendment

Today, [21 September 2022] the U.S. Senate, with strong bipartisan support, gave advice and consent to ratification of the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer. The United States will soon join 137 other countries that have already ratified the Kigali Amendment.

The Kigali Amendment calls for a gradual reduction in the consumption and production of hydrofluorocarbons ("HFCs"), which are potent greenhouse gases. Its global implementation should avoid as much as half a degree Celsius of warming by the end of the century.

The U.S. environmental and business communities strongly support U.S. ratification of the Kigali Amendment, which will help to ensure U.S. industry remains a global leader in the development, manufacturing, production, and deployment of HFC alternatives. Industry estimates indicate that U.S. ratification will support 33,000 new U.S. manufacturing jobs and generate \$12.5 billion in new investments in the U.S. economy over the next decade.



Ratification of the Kigali Amendment will be an asset for innovative American companies that have developed alternatives to HFCs and will help them export U.S. technology to overseas markets.

The Montreal Protocol, which also regulates the production and consumption of ozone depleting substances, is one of the most successful international environmental agreements. It is expected to restore the stratospheric ozone layer by 2065, avoiding 443 million cases of skin cancer, approximately 2.3 million skin cancer deaths, and more than 63 million cases of cataracts in the United States alone, with even greater benefits worldwide. For additional information, visit the State Department's website about the Montreal Protocol and Kigali Amendment [here](#).

[The United States Department of States, 21 September 2022](#)

Image: Department of States website

13. USEPA Stratospheric Protection Division Director Cindy Newberg wins Samuel J. Heyman Award

EPA Career Employee Earns Prestigious Public Service Award for Landmark Ozone and HFC Actions

WASHINGTON – Today [20 September 2022] the Partnership for Public Service announced it had awarded the Samuel J. Heyman Service to America Medal in Science, Environment, and Technology to the U.S. Environmental Protection Agency (EPA)'s Cindy Newberg. Newberg, Director of the Stratospheric Protection Division in the Office of Atmospheric Programs, received the honor for her work to help curb the use of hydrofluorocarbons (HFCs), incredibly potent greenhouse gases that are major contributors to climate change.



"We are so proud of Cindy for winning the 2022 Samuel J. Heyman Medal. Cindy worked to build a coalition of industry leaders, environmental groups, and countries from across the world to commit to a global, unified phasedown of HFCs, protecting people and the planet," said EPA Administrator Michael S. Regan. "With an unwavering dedication to reduce HFC emissions, both at home and abroad, Cindy has proven to be the epitome of public service and inspires all of us at EPA."

The Samuel J. Heyman Service to America Medal, or the Sammies, are a highly respected honor given annually by the Partnership for Public Service after a rigorous selection process. Newberg was recognized for over a dozen years of work to address the production and import of HFCs both internationally and in the United States. These chemicals have commonly been used in refrigeration and air conditioning, aerosols, and foam manufacturing. Because one kilogram of HFCs can pack a climate punch hundreds to thousands of times stronger than the same amount of carbon dioxide, phasing down their use can benefit the climate enormously.

Newberg played a key role in brokering the Kigali Amendment to the Montreal Protocol, providing technical advice and analysis at negotiation sessions around the world. The

Kigali Amendment, an international agreement reached in 2016, phases down the production and consumption of HFCs globally by 80 – 85% by 2047. It is expected that this will prevent up to half a degree Celsius of warming by the end of this century, a critical step towards meeting the Paris Agreement goal of keeping global warming below 2°C and avoiding the worst impacts of climate change.

More recently, Newberg has been leading her team at EPA to implement the American Innovation and Manufacturing (AIM) Act that will phase down HFCs in the United States. In the nine short months after the AIM Act took effect, her division at EPA established the HFC Allocation Program, a cap and phasedown program for HFC production and consumption, that began this year. The HFC Phasedown is expected to result in total emissions reductions from 2022 to 2050 equivalent to 4.6 billion metric tons of CO₂ – nearly equal to three years of U.S. power sector emissions at 2019 levels.

[U.S. Environmental Protection Agency \(USEPA\), 20 September 2022](#)

Image: USEPA website

14. North American Sustainable Refrigeration Council Releases Refrigerant Transition Hub to Help Retailers Shift from High Global Warming Refrigerants



The North American Sustainable Refrigeration Council (NASRC), an environmental nonprofit working to advance climate-friendly natural refrigerants in supermarkets, recently announced it published a [free refrigerant transition hub](#) to help retailers navigate regulation changes implemented by the American Innovation and Manufacturing (AIM) Act. Enacted in 2020, the AIM Act authorizes the Environmental Protection Agency (EPA) to phase down hydrofluorocarbon (HFC) refrigerant greenhouse gas emissions by 85% by 2036.

“HFC regulations from the AIM Act and several states are pressuring retailers to transition to climate-friendly refrigerants,” said Danielle Wright, executive director of NASRC. *“Retailers need neutral information to help them make the right decisions. NASRC works in partnership with the supermarket industry, so we are uniquely positioned to identify the gaps in available resources.”*

The federal phasedown of HFCs is expected to result in refrigerant shortages and significant price increases. In Europe, refrigerant prices increased by 900% following a similar HFC phasedown. Also, new legislation introduced in states such as California proposed to ban the sale and distribution of virgin HFC refrigerants as early as 2025, further driving the need for natural refrigerant solutions.

NASRC will continue to evolve [the hub](#) as state and federal governments pass new legislation. Some of the resources available now include:

- [HFC Policy Tracker](#) – An interactive map to aid retailers in navigating the complex system of regulations by tracking the latest policies at the federal and state levels.
 - [Natural Refrigerants in Supermarkets Factsheet](#) – An overview of why natural refrigerants in supermarkets are one of the most impactful and cost-effective climate solutions.
-

- [Nat Ref Tech Library](#) – The most comprehensive collection of presentations on the latest natural refrigerant technologies.

[Refrigeration World News, 23 August 2022](#)

Image: RWN website

FEATURED



[OZONE SECRETARIAT](#)

Overview for the meetings of the ozone treaties in 2022

[69th IMPCOM](#), Montreal, Canada | 29 October 2022

[33rd MOP Bureau](#), Montreal, Canada | 30 October 2022

[34th MOP](#), Montreal, Canada | 31 October - 04 November 2022

Click [here](#) for past and upcoming Montreal Protocol Meetings Dates and Venue.

SunSmart Global UV App helps protect you from the dangers of the sun and promotes public health.

A new app for mobile phones that provides localized information on ultraviolet (UV) radiation levels has been launched by the World Health Organization (WHO), the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP) and the International Labour Organization (ILO). The *SunSmart Global UV app* is available free of charge

at both the [Apple App](#) and [Google Play](#) stores. It provides personalized options so that users can take actions to protect prolonged, excessive UV exposure, a major cause of skin cancer and other UV related diseases. The app allows the inclusion of national and local data streams and adaptation to multiple languages – it is currently available in Chinese, English, French, Russian, Dutch and Spanish.

Image: UNEP, Ozone Secretariat website



Online introductory course 'International legal framework on ozone layer protection'

Designed for government representatives and national stakeholders new to the Vienna Convention and Montreal Protocol, students of environmental law, and anyone interested in learning about the ozone treaties, the [online course](#) launched by the Ozone Secretariat aims to provide an introduction to the international legal framework on ozone layer protection.



[United Nations Environment Programme \(UNEP\), Ozone Secretariat](#)

Image: UNEP, Ozone Secretariat website

Free teaching kits on ozone layer and environmental protection

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



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

Image: UNEP, Ozone Secretariat website

The UN Environment Assessment Panels

The Assessment Panels have been vital components of ozone protection since the Montreal Protocol was first established. They support parties with scientific, technological and financial information in order to reach decisions about ozone layer protection and they play a critical role in ensuring the Protocol achieves its mandate. The Assessment Panels were first agreed in 1988 to assess various direct and indirect impacts on the ozone layer. The original three panels are:

- [The Technology and Economic Assessment Panel](#)
- [The Scientific Assessment Panel](#)
- [The Environmental Effects Assessment Panel](#)

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

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



[THE MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL](#)

Montreal Protocol@35: global cooperation protecting life on earth

16 September 2022 marks the 2022 International Day for the Preservation of the Ozone Layer and the 35th anniversary of the Montreal Protocol. We commemorate how this multilateral agreement ended as one of the biggest threats ever to face humanity as a whole: the depletion of the ozone layer, which is now healing, allowing it once again to shield humanity from the sun's ultraviolet radiation. The Montreal Protocol, with its implementation mechanism, the Multilateral Fund, is referred to as the most successful environmental treaty to date and is vivid evidence that multilateralism and effective global cooperation work and will continue working towards building The Future We Want.

With the financial support of non-Article 5 countries (developed countries), which have totalled over US \$4.49 billion as of September 2022, and the work of bilateral and implementing agencies, the Fund has supported over 9,000 projects, including industrial conversions, technical assistance, training, and capacity building in 148 countries, and phased out 99 per cent of all ozone depleting substances. This has allowed ecosystems to survive and thrive, slowed climate change by slowing global temperature rise, and protected millions of people from cataracts and skin cancer.

As implementation of the Kigali Amendment to the Protocol begins, the commitment of Parties to phase down hydrofluorocarbons (HFCs) can help avoid up to 0.4°C of global temperature rise by the end of the century. Replacing HFCs also creates an opportunity to increase energy efficiency of cooling equipment, significantly reducing energy costs to consumers and businesses.

On this World Ozone Day, we celebrate the achievements of the Montreal Protocol, and the many more to come!

- [Updated guide for the presentation of stage II of HCFC phase-out management plans \(August 2022\)](#), 9/19/2022
 - [The provisional agenda for the 91st meeting is now posted](#), 9/14/2022
 - [The Information Note for the 91st meeting is now available](#), 9/9/2022
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- [Policies, Procedures, Guidelines and Criteria of the Multilateral Fund \(July 2022\)](#), 7/29/2022
- [HCFC phase-out management plans and HCFC production phase-out management plans \(July 2022\)](#), 7/28/2022
- [Updated guide for project preparation of Stage I of Kigali HFC implementation plans \(KIP\) \(April 2022\)](#), 4/28/2022
- [Executive Committee Primer 2022](#), 1/23/2022
- [Adjusted consolidated business plan of the Multilateral Fund 2022-2024](#), 1/5/2022

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



OzonAction

[OzonAction Compliance Assistance Programme](#) produces and outreaches a wide variety of information and capacity building materials and tools that support the implementation of the Montreal Protocol programs and assist Article-5 countries in meeting the compliance targets. These include publications, technology briefs and factsheets, mobile applications, videos, e-Learning, modelling and database programs and special educational or certification programs.

The section below features several of our most recent products.

Visit [OzonAction website](#) for more information, discover the entire range of products.

Images in this section are by OzonAction

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

Local Technical & Vocational Education and Training (TVET): This Knowledge Map provides a global directory of TVET entities and centres around the world. These are the strategic partners for



conducting and promoting training and certification programmes related to the refrigeration servicing sector.

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

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

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

Content of Gas Cards - Each Gas Card is printable (in PDF or image format) and includes the following information about each substance/gas: a) General Characteristics (Chemical name, formula and type, ASHRAE designation, Trade names, Harmonized System (HS) codes, Chemical Abstract Service (CAS), United Nations (UN) numbers, Blend/ mixture components, Montreal Protocol Annex and Control measures, main usage, etc.) b) Gas Performance—Radar Chart (in terms of: Ozone depleting potential-ODP, Global warming potential- GWP, Toxicity Class & Flammability Class) c) Environmental and Safety Impact, and Safety Impact (with visualization of Toxicity & Flammability Class, Hazardous Symbols).



More Information - The Gas Card web based tool is part of UNEP OzonAction's portfolio of activities and tools to assist various stakeholders in developing countries, including customs officers and technicians, to achieve and maintain compliance with the Montreal Protocol on Substances that Deplete the Ozone Layer. In the left navigation bar of the Gas Card tool web page, you will find a list of commonly used HFCs and HFC Blends in different sectors. *

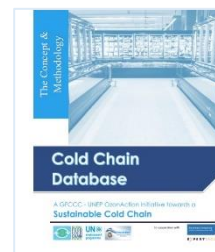
Using the Gas Card web-based tool

- The Gas Card tool is available online on the [OzonAction website](#)
- Read the full [2021 annual iPIC report](#)
- See the [flyer](#) introducing the new iPIC platform

** Based on the Overall Analysis of the Results of the Survey of ODS Alternatives Report (conducted in 119 countries from 2012 to 2015)*

OzonAction and GFCCC launch the methodology questionnaires the Cold Chain Database Initiative

The Global Food Cold Chain Council (GFCCC) and the United Nations Environment Programme (UNEP) OzonAction announced the launch of their Cold Chain Database and Modeling initiative. The initiative marks the first formal step to assist developing countries in identifying their cold chain baseline along with consumption of relevant HCFCs or HFCs or other refrigerants. The initiative was conceived in 2019 and kicked off during the 31st Meeting of Parties to the Montreal Protocol (Rome, Italy), which concluded with the



Rome Declaration on “The Contribution of the Montreal Protocol to Food Loss Reduction through Sustainable Cold Chain Development”.

- > [GFCCC-UNEP OzonAction Cold Chain Modelling Press Release](#)
- > [GFCCC-UNEP Cold Chain Database Methodology Final](#)
- > For countries or partners interested to use the model data collection detailed questionnaires, please fill in the [Expression of Interest and NDA of Cold Chain Database](#) form and return to [Ayman Eltalouny](#)

Contact: [Ayman Eltalouny](#), Coordinator International Partnerships, UNEP, OzonAction



The screenshot shows a desktop application window titled "HCFC Quota and Licence Tracker". The interface features a table with columns for "Substance", "Monthly HPMP", "Monthly Licence Issued", "Quota", "Units", and "Licence". The table contains several rows of data, with some cells highlighted in red. The application also includes a search bar and various control buttons.

[HCFC Quota and Licence Tracker](#) - a new desktop application to assist with HCFC licences and quotas - National Ozone Officers have the great responsibility of managing the allocation and monitoring of quotas for substances controlled under the Montreal Protocol. This process can be

complex with many importers, especially if the country imports a range of different hydrochlorofluorocarbons (HCFCs) and mixtures containing HCFCs. To address this challenge, OzonAction developed a new desktop application that helps Ozone Officers with the tasks of planning, calculating, monitoring and managing consumption quotas and licences. It can be used on a daily basis to track and manage the current year's quota allocations for different importers, or for future planning by trying different scenarios that adjust the type of substances imported, their quantity, or the number of importers. The HCFC Quota and Licence Tracker allows Ozone Officers to see the effect of such scenarios on the national HCFC consumption and helps ensure that the quotas stay within agreed HCFC Phase-out Management Plan (HPMP) targets. For countries that have ratified the Kigali Amendment, in the future OzonAction will extend the tracker to include hydrofluorocarbons (HFCs) once countries begin designing their quota systems for those controlled substances.

Access the:

- [HCFC Quota tracker app](#)
 - [Flyer for more information on the tracker](#)
 - [Short video tutorial on the OzonAction YouTube Channel](#)
-

[GWP-ODP Calculator Application](#) - Updated- “Quickly, efficiently and accurately convert between values in metric tonnes, ODP tonnes and CO₂-equivalent tonnes”- Data are extremely important for the Montreal Protocol community, and the data reporting formats for both A7 and CP have changed recently, to a large degree triggered by the Kigali Amendment. HFCs, blends, CO₂-equivalent values, etc, now have to be addressed much more frequently by Ozone Officers during their daily work. Sometimes the terminology and values are complex and can be confusing, and it helps to have it all the official facts and figures in one place. Conversion formulas need to be applied to calculate CO₂-eq values from both GWP and metric tonne values. This free app from OzonAction is a practical tool for Ozone Officers to help demystify some of this process and put frequently needed information at their fingertips.



What's new in the app:

- An updated more user-friendly interface
- Multilingual interface: English, French and Spanish
- A new **Kigali Amendment mode** - in this mode the GWP values used to calculate the refrigerant blends/mixtures only include GWP contributions from components that are controlled HFCs
- Latest updated ODP and GWP values from the recent reports from the Montreal Protocol technology and scientific expert panels as well as the Intergovernmental Panel on Climate Change (IPCC) reports
- References added for sources of all values
- New refrigerant mixtures (with ASHRAE -approved refrigerant designations)

If you already have the application installed on your device, be sure to update to benefit from the new features. The app can be viewed in English, French or Spanish.



Smartphone Application: Just search for “GWP-ODP Calculator” or UNEP in the Google Play store or use the QR code – free to download! If you already have the application installed on your device, be sure to update to benefit from the new features.



Desktop Application: GWP-ODP Calculator is also available online on the OzonAction [website](#)



Watch the new short introductory tutorial **video** on the GWP-ODP Calculator- available now on [YouTube](#)

>>> Read/download the [flyer](#)

Updated OzonAction "WhatGas?" Mobile App - The OzonAction 'WhatGas?' application is an information and identification tool for refrigerant gases: ozone depleting substances (ODS), HFCs and other alternatives. It is intended to provide some stakeholders, including Montreal Protocol National Ozone Officers, customs officers, and refrigeration and air-conditioning technicians with a modern, easy-to-use tool that can be accessed via mobile devices or the OzonAction website to facilitate work in the field, when dealing with or inspecting ODS and alternatives, and as a useful reference tool.



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

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

RAC Technician Videos - Full length films! Two 'full length' videos for refrigeration and air-conditioning (RAC) sector servicing technicians: on 1) Techniques, Safety and Best Practice and 2) Flammable Refrigerant Safety.




The OzonAction Refrigeration and Air-Conditioning Technician Video Series consists of instructional videos on techniques, security and best practice and flammable refrigerant safety. They are intended to serve as a complementary training tool RAC sector servicing technicians to help them revise and retain the skills they have acquired during hands-on training. The videos are not intended to replace structured formal technician training, but to supplement and provide some revision of tips and skills and to build on training already undertaken.

These videos are based on the successful UNEP OzonAction smartphone application, the RAC Technician Video Series app. This application has been downloaded on more than **86,000** devices since its launch.

Following many requests to make the videos more versatile and better suited to classroom and training settings, OzonAction has responded to this demand and produced two 'full-length' instructional videos.

You may wish to share this message and the flyer with:

- Your national/regional RAC associations
- Training or vocational institutes
- Master RAC trainers in your country
- Any other interested national stakeholders

 You can watch these videos on the OzonAction YouTube Channel:

- [Techniques, Safety and Best Practice](#)

- [Flammable Refrigerant Safety](#)

↓ The videos are also available for download by request from UNEP OzonAction:
unep-ozonaction@un.org



If you prefer to access the video clips via the OzonAction smartphone application, just search for “RAC Technician Video Series” or UNEP in the Google Play Store and iTunes/App Store or scan the QR code – **Free to download!**

The flyer is available from the [OzonAction website](#).

[Refrigerant Cylinder Colours: What has Changed](#) - A new UNEP OzonAction factsheet on the new AHRI revised guideline on a major change to refrigerant cylinder colours - One of the ways in which refrigeration cylinders are quickly identified is by cylinder colour. Although there was never a truly globally-adopted international standard, the guideline from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) although not required by law was used by the vast majority of industry and chemical producers around the world. An AHRI revised guideline, first published in 2015, now removes paint colour assignments for refrigerant containers and specifies that all refrigerant containers should have the same paint colour from 2020 onwards. NOOs and technicians should be aware of this change and inform national stakeholders, as well as familiarising themselves with relevant container labels and markings for refrigerants. **Read/download the [factsheet](#)**



Update on [new refrigerants designations and safety classifications](#) - The latest version of the factsheet providing up to date information on refrigerant designations and safety classifications is now available (September 2020 update). The factsheet, produced by **ASHRAE** in cooperation with **UN Environment Programme OzonAction** is updated every 6 months. **Read/download the [factsheet](#)**

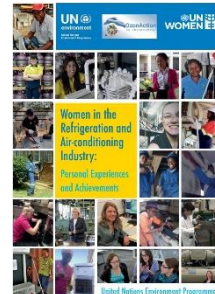


Contact: [Ayman Eltalouny](#), OzonAction, UN Environment Programme

[OzonAction's iPIC platform - Updated](#) - Collaboration between China and Thailand using OzonAction's informal Prior Informed Consent (iPIC) system has resulted in the prevention of a huge consignment of ozone-depleting and climate damaging hydrochlorofluoro-carbons (HCFCs). Those chemicals, which are primarily used as refrigerants for air conditioners and fridges, are controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer and are being phased out by all countries according to a specific timeline.



[Women in the refrigeration and air-conditioning industry: Personal experiences and achievements](#) - The United Nations Environment Programme's (UNEP), OzonAction, in cooperation with UN Women, has compiled this booklet to raise awareness of the opportunities available to women and to highlight the particular experiences and examples of women working in the sector and to recognise their successes. All of the professionals presented in the booklet are pioneers. They are role models whose stories should inspire a new generation of young women to enter the weld and follow in their footsteps. **Read/download the [publication](#)**



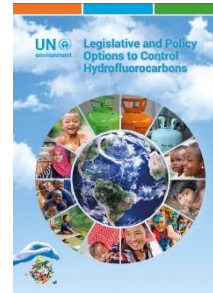
As part of IIR and UNEP OzonAction's partnership, a set of Cold Chain Technology Briefs was released over the past few years, which includes in-depth summaries about the cold chain in different key sectors. They include descriptions of technology, refrigerant options and trends and conclude with prospects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

Download the Cold Chain Technology brief in [English](#) | [French](#) | [Russian](#) | [Spanish](#)



PUBLICATIONS

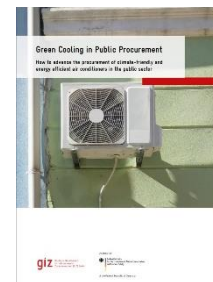
Legislative and Policy Options to Control Hydrofluorocarbons - In order to follow and facilitate the HFC phase-down schedules contained in the Kigali Amendment, the Parties, including both developed and developing countries, will have to implement certain measures. This booklet contains a recommended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



Latest issue of Centro Studi Galileo magazine, **Industria & Formazione**, n. 7-2022 (in Italian).

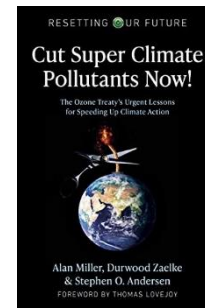


Green Cooling in public procurement - How to advance the procurement of climate-friendly and energy-efficient cooling equipment in the public sector? Air conditioning in public buildings is often responsible for around 50% of total electricity consumption. Switching to climate-friendly cooling technologies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



Cut Super Climate Pollutants Now!: The Ozone Treaty's Urgent Lessons for Speeding Up Climate Action (Resetting Our Future). We have a decade or less to radically slow global warming before we risk hitting irreversible tipping points that will lock in catastrophic climate change. The good news is that we know how to slow global warming enough to avert disaster. Cut Super Climate Pollutants Now! explains how a 10-year sprint to cut short-lived "super climate pollutants" -- primarily HFC refrigerants, black carbon (soot), and methane -- can cut the rate of global warming in half, so we can stay in the race to net zero climate emissions by 2050.

Authors: Alan Miller, Durwood Zaelke, Stephen O. Andersen.



E-Book on Process Safety Management (PSM) Training for Ammonia Refrigeration - a new e-book about the critical elements of a process safety management (PSM) training program for facilities operating an ammonia refrigeration system.

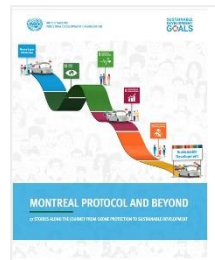
The e-book, titled "[7 Keys to a Compliant PSM Training Program for Ammonia Refrigeration](#)," outlines important questions a facility's program should address and questions that trained plant personnel should be able to answer. Topics covered include:

- Safety hazards and health considerations
- Emergency shutdown procedures
- Addressing deviations from system operating limits
- Risks and costs of non-compliance with regulatory standards

Request free Download [here](#)

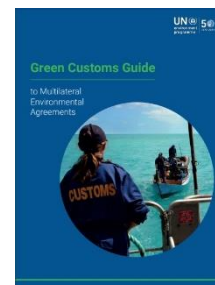


[Montreal Protocol and beyond: 17 stories along the journey from ozone layer protection to sustainable development](#) - The 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs) embody the global commitment to build a more sustainable future for all. These universally agreed objectives address the most urgent environmental, social, and economic challenges of our time. [Read/Download here](#)



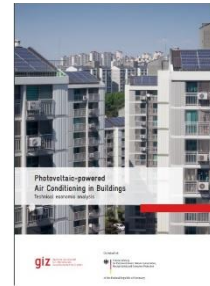
The Green Customs Guide to Multilateral Environmental Agreements was designed to promote sustainable trade and encourage customs and border control officers to take on a proactive role in protecting the environment. The guide provides useful information and guidance about relevant trade-related multilateral environmental agreements (MEAs), thus facilitating legitimate trade in environmentally sensitive items while preventing illicit trade in such items and contributing to the achievement of the [Sustainable Development Goals](#).

Read/Download the [full report](#).

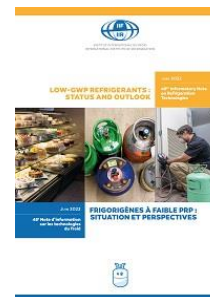


See pages 91-98 on "How the Montreal Protocol regulates trade", and "Montreal Protocol-specific training materials for customs officers."

Photovoltaic-powered Air Conditioning in Buildings - Space cooling in buildings is characterized by enormous growth rates, due to increasing ambient temperatures, growing population and urbanisation. Air-conditioned buildings in many countries are largely dominated by mid to low appliance energy efficiency levels, highly climate-damaging refrigerants as well as fossil-fuel based electricity supply. This in sum generates a huge amount of greenhouse gas (GHG) emissions, furthering climate change. The objective of this paper is to further unfold the technical and economic potential of solar PV-powered green air conditioners. Therefore, it focuses on the most widely applied type of active cooling appliance: single split-type air conditioning systems with a cooling capacity up to 5 kW. It looks at the current development of technical main components and based on that defines model cases for hybrid and off-grid solutions for private and small commercial applications. The technical and economic potential for these cases is then analysed for 13 countries worldwide. Subsequently, a case study on Médecins Sans Frontières' (MSF) solar AC project in Haiti provides practical insights on the use of PV-powered AC systems in the context of off-grid social infrastructure. **Read/Download the study [here](#)**



International Institute of Refrigeration (IIR) New Informatory Note. Low-GWP Refrigerants: Status and Outlook - The latest IIR Informatory Note outlines the options available for low-GWP refrigerants and their respective performance. It provides a series of recommendations on refrigerant selection criteria, research priorities and personnel training. A [Summary for policymakers](#) outlining the main conclusions and recommendations of this Informatory Note is available in open access. Also available in [French](#) language.



MISCELLANEOUS



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

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

We 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 Programme, OzonAction

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



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Prepared by: Samira Korban-de Gobert
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