



TOP STORIES / ENVIRONMENT

## GREENHOUSE GASES

# Banning the 'super' greenhouse gas

Hydrofluorocarbons, which replaced ozone-depleting CFCs, proved disastrous for climate change. Countries have now agreed to ban HFCs - but that may not bring as big a climate benefit as was hoped.



It's a historic achievement in the fight against global warming: Envoys from the nearly 200 nations signed up to the Montreal Protocol gathered at a high-level meeting in the Rwandan capital Kigali last week managed on Saturday (15.10.2016) to strike a [crucial deal](#) to phase out the use of hydrofluorocarbons (HFCs), which act as potent greenhouse gases.

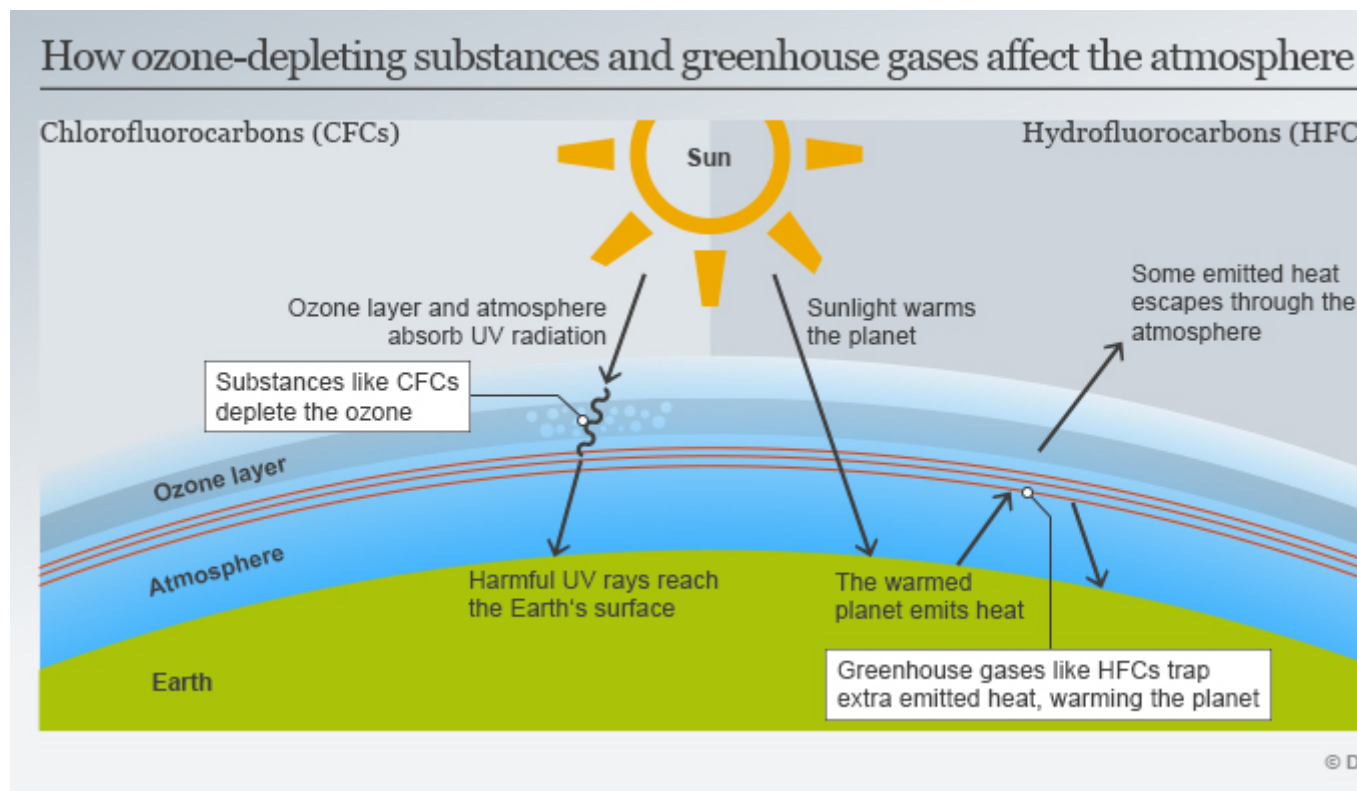
This agreement was initially understood to prevent a 0.5 degree Celsius (0.9 degree Fahrenheit) increase in global warming by the end of the century.

Although the ban will help in the fight against climate change, uncertainty around HFCs' impacts has tempered this estimate.

"A very straightforward case would mean 0.25 or 0.3 degree of warming prevented," said Michiel Schaeffer, science director at Climate Analytics. However, this will not count against the 2 degree limit cited in the Paris Agreement.

## What are HFCs?

HFCs are compounds consisting of hydrogen, fluorine, and carbon atoms, produced synthetically and used primarily for cooling.



HFCs were introduced in the 1990s as a supposedly more environmentally friendly alternative to replace chlorofluorocarbons (CFCs) in refrigerators, aerosols, air conditioners and foam insulation after the ozone-protecting 1987 Montreal Protocol was introduced.

Scientists had realized that CFCs were responsible for the growing hole in the ozone layer, a blanket of gas in the upper stratosphere which protects Earth from the sun's dangerous ultraviolet rays, and they were phased out.

But belief in their successor HFCs' eco-credentials was badly misplaced.

## Just how bad are HFCs for the environment?

HFCs are catastrophic for global warming. Scientists later realized that HFCs - which don't harm the [now-healing ozone layer](#) - are thousands of times more potent at trapping heat in the atmosphere than carbon dioxide, the most abundant greenhouse gas.

US Secretary of State John Kerry, who attended last week's meeting in Rwanda, said recently that each year, HFCs currently emit as much pollution as 300 coal-fired power plants.

And what makes HFCs even more worrying is that they are increasing at a rate of 10 to 15 percent a year, according to Greenpeace, which it says makes them the fastest-growing greenhouse gas.

This growth is mainly due to demand for air conditioners - according to the Berkeley National Laboratory, the world is likely to have another 700 million air conditioners by 2030.



The rise in HFCs can be attributed to global growth in air conditioners

Scientists say a quick reduction of HFCs under the treaty could dramatically slow climate change. A 2013 study had estimated that an HFC ban would avoid a 0.5 degree Celsius projected rise in average temperatures by 2100.

The 0.5 degree estimate, however, had represented the upper end of uncertainty around the warming power of HFCs. An updated 2015 scenario that included technological developments and economic scenarios had cut this in half, Schaeffer told DW.

Schaeffer said "0.2 [degrees Celsius reduction] would be a first-order, revised central estimate."

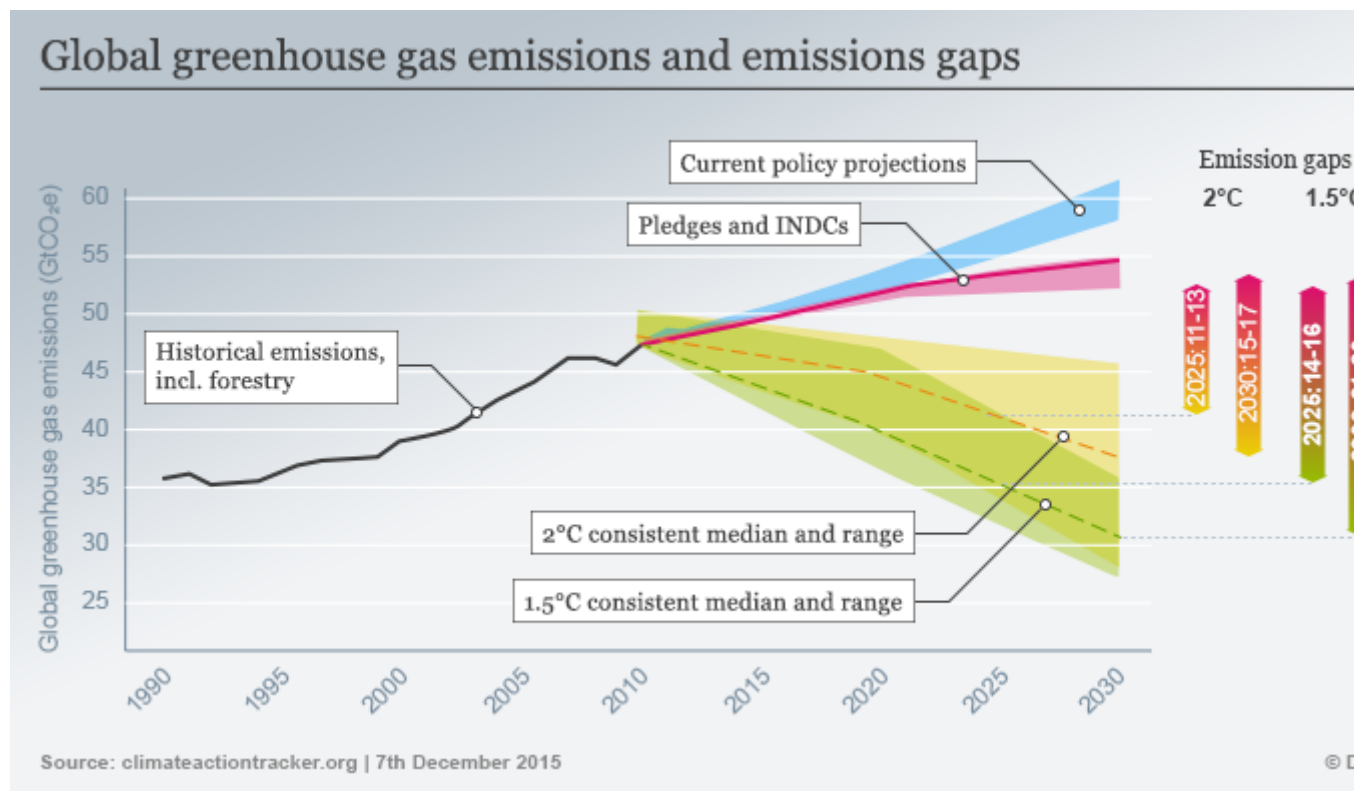
But elimination of HFCs, including this prevented temperature increase, don't count toward emission reductions for the [Paris Agreement on climate change](#), which aims to keep global warming below 2 degrees Celsius compared with pre-industrial levels. In previous calculations, the threat from HFCs had already been eliminated or taken into account, Schaeffer explained.

So the present ban on HFCs "is by far not enough to reach the Paris Agreement goals, and it



doesn't give us anything on closing the emissions gap," Schaeffer said.

Climate Analytics contributes to Climate Action Tracker, which makes projections linking government policy with global temperature increase.



What was the sticking point in trying to reach a deal on HFCs?

The issue was how fast HFCs should be phased out. Negotiators had weighed various proposals for amending the protocol to "freeze" HFC production and use to some point between now and 2031.

The US and western countries wanted them banned as quickly as possible. Although the US and China have their differences on the global stage, the world's two largest polluters have recently pushed together to fight climate change, and urged countries to extend the Montreal Protocol to include HFCs.

They also sought agreement on an "early freeze date" for when countries must cap their use of HFCs. More than 100 nations including the US, the European Union and many African states favored a peak by 2021.

But India, the world's third-largest polluter, supported the later date of 2031. Other hot countries where air conditioners that use HFCs are in high demand wanted temporary exemptions.

Regardless of timing, less-developed countries are seeking financial help from richer ones to help them implement the treaty. Last month, a group of developed countries and companies

offered \$80 million (72 million euros) to help developing countries switch away from HFCs.

## What was decided?



Kerry has been a major force in the recent US push for climate protection

The deal agreed Saturday, which is legally binding, splits countries into three groups with differing deadlines for phasing down HFCs.

Developed nations, including the US and many European countries, will start reducing HFC emissions by 2019.

A second group of around 100 developing nations, including China, will start reducing in 2024.

A third, smaller group of countries - including India, Pakistan and some Persian Gulf states - will begin their phase-out later, in 2028.

Under the agreement, HFC emissions are supposed to peak by 2024.

## What are the alternatives to HFCs?

Avipsa Mahapatra from independent campaigning organization the Environmental Investigation Agency (EIA), told DW there are [many alternatives](#).

"It's like with renewable energy: some will be better off using solar power than wind power," Mahapatra said. She pointed for example to ammonia and carbon dioxide. "They are refrigerants that we used in the past, and are available today."

For manufacturers of CFCs, it was a relatively simple switch to start producing HFCs instead, Mahapatra told DW, adding that some of these companies have put up "artificial barriers" to discourage use of the alternatives.

But Mahapatra also said that industry could prove quicker at phasing out HFCs than governments. In Europe, 5,000 supermarkets already use carbon dioxide and ammonia in their fridges, she pointed out.

Another example is an Indian manufacturer Godrej & Boyce, which in 2012 developed a range of air-conditioning systems that use the natural refrigerant propane.

Mahapatra said she was "very optimistic" that if the US and the EU implement their HFC phase-outs soon, other countries would quickly follow.

"It's really important that they move early."

## DW RECOMMENDS

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### Nearly 200 nations reach agreement to phase out HFC greenhouse gases

In an effort to combat climate change, representatives of nearly 200 countries meeting in Rwanda have agreed to limit the use of HFC gases commonly used in refrigeration. (15.10.2016)

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### What are the next steps as the Paris Agreement comes into force?

It's a historic moment: The Paris climate agreement will come into force at lightning speed, in less than a year. But what needs to happen over the months and years to come, if we are to get a handle on global warming? (06.10.2016)

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### Study: Ozone layer has begun healing itself thanks to CFC ban

The hole in the ozone layer over the Antarctic has begun to shrink, signaling good news for the environment, researchers say. The study attributes the development on the phasing out of CFC pollutants. (01.07.2016)

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### A guide to refrigerants, both synthetic and natural

Synthetic refrigerants such as CFCs, HCFCs and HFCs are big climate killers. Natural alternatives include carbon dioxide. (07.09.2010)

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### Natural coolants help supermarkets reduce carbon footprint

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### The Montreal Protocol

The Montreal Protocol

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