



EFCTC NEWSLETTER

An update on fluorocarbons and sulfur hexafluoride

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EMISSIONS AND SALES OF FLUOROCARBONS FOR 2005

AFEAS has published the [2005 emissions and sales](#) of Fluorocarbons from responding companies. Data are available through 2005 for HCFCs 22, 124, 141b and 142b and HFCs 134a, 125 and 143a. They do not include production in Russia, Korea, India and China.

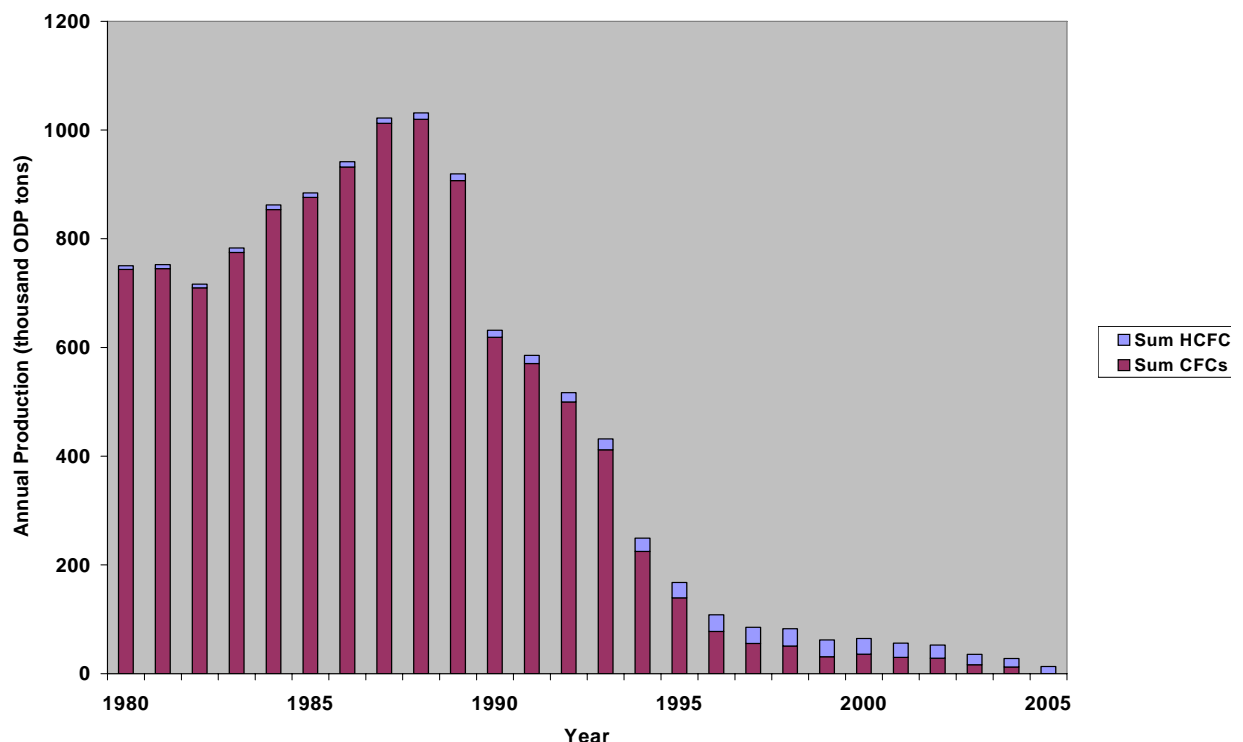
As announced for the [2004 data](#), CFC statistics are no longer collected, because the total production of all CFCs reported to AFEAS in 2004 was very small, less than 2% of that in the peak year, 1988, and had fallen to the level of the late 1940s.

All of the production and sales data through 2005 is available for download at the AFEAS [Data Download Page](#).

Fluorocarbon alternatives initially grew rapidly after their introduction to replace CFCs but now have varied growth rates, with most levelling off as they become more mature products. Production of HCFCs reported to AFEAS has fallen significantly since 1996. The increase in total HFC production has been modest compared to the decline in CFCs and HCFCs.

As illustrated in the following plot, the production of CFCs and HCFCs by AFEAS reporting companies, weighted according to the ozone depletion potential (ODP) of each compound, has been reduced by 97% from the peak year, 1988.

**ODP-Weighted Fluorocarbon Production
1980-2005**



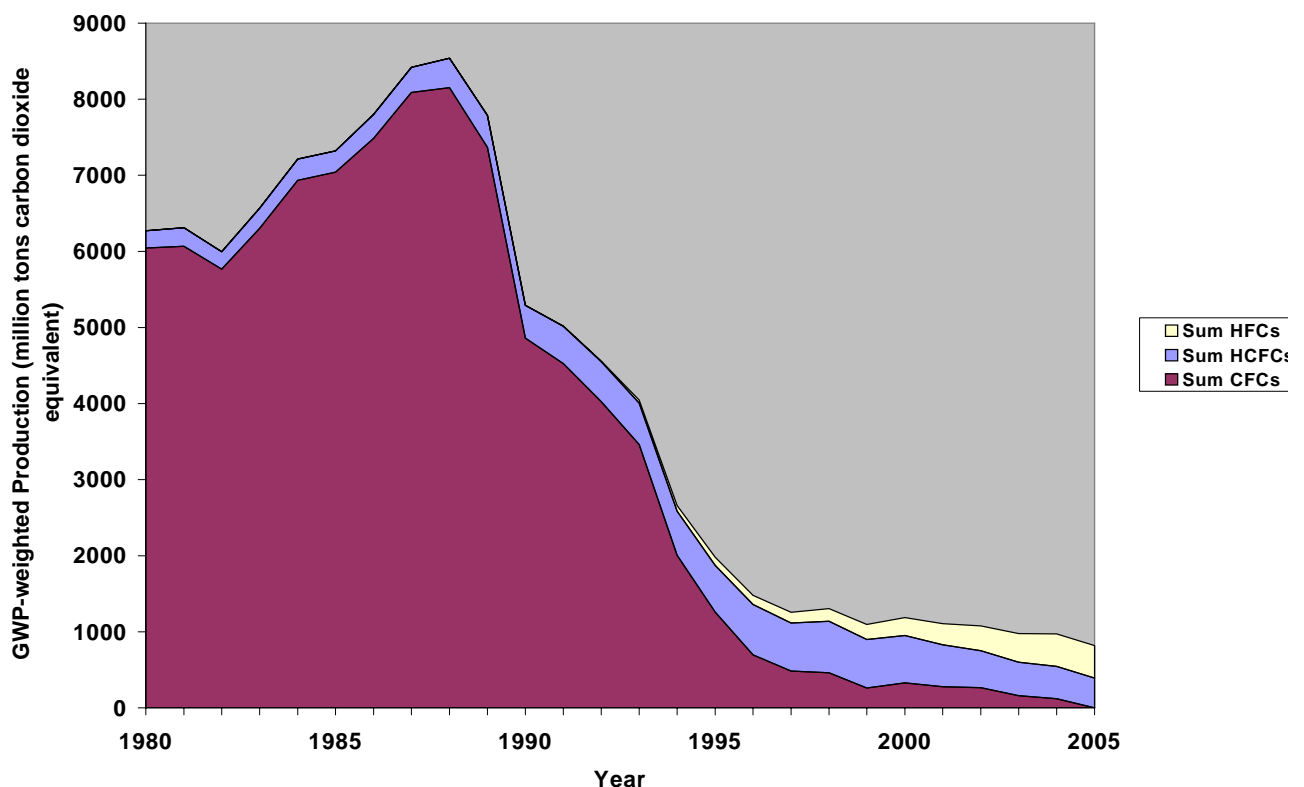


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Similarly, the production expressed in GWP weighted tonnes has declined by about 89% from 1988, the peak year.

GWP-Weighted Fluorocarbon Production 1980-2005



Estimates of atmospheric releases of the individual HCFCs and HFCs are also provided. The emission patterns and release delays are under continuing review because of the changes in use practices in the wake of the Montreal Protocol.

These revised emission functions have been used in calculating the emissions.

DOUBTS ON CO₂ AS REAL ALTERNATIVE FOR MAC IF PUT IN MASS PRODUCTION

CO₂ in MAC (Mobile Air Conditioning) could be a serious concern in equipment mass production, because sources of leakages could not be completely eliminated: this is a conclusion of a paper in the reputable IEA Heat Pump Centre Newsletter, published by the SP Technical Research Institute of Sweden.



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Whereas impressive improvements have been achieved in the functionality of CO₂ systems, the author points to the crucial issue of refrigerant containment, not only from a performance standpoint but also from a reliability and durability standpoint.

Assembling the complete MAC system in a vehicle on the final assembly line with the regular workers with a line speed of typically 40-70 cars per hour will only allow a short time of 1-2 minutes, during which all the leak checks have to be performed.

The author concludes that it will not be possible even to find the leaks that would need to be fixed, for the following reasons:

- Elastomer sealing elements used with HFC-134a systems do not withstand transcritical CO₂ systems conditions, which will require metal seal rings, made tight by being torque together. This control is more demanding and would require even more time than today to be realized.
- Due to the pressure conditions, the probability of a car coming off the assembly line with an excessive leak rate will be 20-30 times higher with CO₂ than with HFC-134a.
Also, due to the higher system pressure with CO₂, the size of leaks to be identified is 1/20 to 1/10 of the size needed to be detected in the case of a HFC-134a system.
- While leaks of HFC-134a can easily be detected following [innovative standards](#), CO₂ itself cannot be used as a tracer gas.

Source: IEA Heat Pump Centre (HPC) Newsletter Volume 25 - No. 4/2007

<http://www.heatpumpcentre.org/Newsletters> (downloadable by member countries persons).

CFCs AND HCFCs RELEASED FROM FOAM INSULATION READILY BIODEGRADED IN LANDFILLS

Danish researchers have established that CFC and HCFC [blowing agents](#) contained in appliance foam and building insulation materials are very readily degraded in anaerobic landfill conditions.

It may happen that end-of-life insulation materials containing Fluorocarbons could be disposed of in landfills, in some cases contrary to some EU or national regulations.

The objective of the research was therefore to evaluate the potential for degradation of these Fluorocarbons in landfills, and to develop a landfill model, which could simulate their fate in landfills.



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Anaerobic degradation using different types of organic waste and anaerobic digested sludge was studied.

The study included CFC-11, CFC-12, HCFC-141b, HFC-134a, and HFC-245fa, as well as some of their expected degradation products like HCFC-21, HCFC-22, HCFC-31, HFC-32, and HFC-41.

Degradation of all studied CFCs and HCFCs was observed regardless the type of waste used. CFC-11 was rapidly degraded within 15-20 days; equivalent results were obtained for CFC-12 and HCFC-141b.

The anaerobic degradation of the studied HFCs was not observed

Source: Environ. Sci. Technol., **41** (22), 7714 -7722, 2007.

THE MONTREAL PROTOCOL IS MITIGATING CLIMATE EMISSIONS BY 11 TIMES MORE THAN THE KYOTO TARGET

Thanks to the [Montreal Protocol](#), emissions of 135 billion tons of CO₂-equivalent have been avoided between 1990 and 2010, or 11 billion tons of CO₂-eq. per year—representing 11 times the [Kyoto Protocol](#) mandated reduction of 1 billion tons per year.

This was the introduction of a paper co-authored by the former Executive Secretary of the Montreal Protocol Secretariat.

On top of this, the [Montreal Protocol decision](#) of the September 2007 MOP (Meeting of the Parties) to further strengthen the HCFC phase-out will allow to capture additional billion tons of CO₂-equivalent—in one week of negotiations, praises the paper.

Combined voluntary and national efforts to phase out ODS before the MP was started, and to the mandatory efforts under the Protocol, have succeeded to mitigate the overall growth of all Greenhouse Gases by a significant 35-40 years delay.

Source: How to Make Bali Climate Talks Productive. Some Hints from the Montreal Protocol by K. Madhava Sarma & Durwood Zaelke.

<http://www.igsd.org/OpEdBali10Dec1pm.pdf>