



EFCTC NEWSLETTER

An update on fluorocarbons and sulfur hexafluoride

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SPECIAL IPCC / TEAP REPORT

SAFEGUARDING THE OZONE LAYER AND THE GLOBAL CLIMATE SYSTEM ISSUES RELATED TO HYDROFLUOROCARBONS AND PERFLUOROCARBONS

The [Summary for Policymakers](#) of the IPCC "[Special Report on Safeguarding the Ozone Layer and the Global Climate System](#)" has been officially published, after having been approved at its April 2005 IPCC meeting in Addis Ababa, Ethiopia. The full report will be published in mid-2005 and will be made available on the [IPCC website](#).

The Report aims to decrease the combined climate impact of all halocarbons while keeping the objective to protect the ozone layer. Reconciling the targets of both the [Montreal](#) and the [Kyoto Protocols](#), it represents the best state of knowledge on issues related to [HFCs](#) and [PFCs](#) at the present time.

As stated by WMO Secretary-General Michel Jarraud, "We must continuously monitor, undertake research and improve how we manage this group of **extremely useful substances**, which is implicated in [...] two of the major environmental problems we have ever known."

Besides, UNEP acknowledges that the Report confirms that implementing the Montreal Protocol by replacing ODS with HFCs, has reduced the global production of ozone-depleting gases and essentially stabilized the ozone layer.

KEY FINDING: HFCs ONLY 2% OF GLOBAL GREENHOUSE GAS EMISSIONS BY 2015

The Report acknowledges that the replacement of CFCs has begun to reduce atmospheric chlorine loading, which is expected to lead to a slow [recovery of the ozone layer](#). On the other hand, as replacements, including HFCs, generally have lower a GWP, and because quantities have been reduced, total halocarbon emissions have decreased, and their impact on climate change has also been [dramatically reduced](#).



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- Combined emissions of all Fluorocarbons Greenhouse Gases (CFCs, HCFCs, HFCs) decreased between 1990 and 2000 from about 7.5 Gt/yr CO₂-equivalent down to 2.5 Gt/yr CO₂-equivalent, representing respectively 33% and 10% of annual CO₂ emissions due to fossil fuel burning. This major reduction of greenhouse gas emissions (*) was made only possible by the use of HFCs to replace [ODS](#) (Ozone Depleting Substances).

()EFCTC Comment Note : this achievement represents about 3 times the objective of the Kyoto Protocol*

- By 2015, total emissions of all Fluorocarbons Greenhouse Gases under a Business-As-Usual (BAU) scenario will represent 2.3 Gt/yr CO₂-equivalent. CFC and HCFC emissions decrease will be nearly compensated by HFC emissions, including increased emissions of HFC-23, by-product of the HCFC-22 production.
- Despite a threefold increase of global HFC emissions to replace ODS (from 0.4 in 2002 to 1.2 Gt/yr CO₂-equivalent by 2015) in the BAU scenario, the Report projects that HFC radiative forcing (**cumulative** contribution to global warming) will remain **below 1%** of the estimated radiative forcing of all greenhouse gases in 2015.
In terms of **yearly** emissions, they will **account for 2 %** of greenhouse gas emissions.
- This projected increase is the result of increasing HFC use in the RAC (refrigeration and air conditioning) sectors, and also of increased HFC-23 emissions (because of the increase in HCFC-22 production, the PTFE raw material).
Projected mitigation measures (application of best practices and recovery methods in HFC applications, capture of HFC-23 or minimization of its formation) can **more than halve HFC emissions** by 2015. In this case, they would be at a level similar to 2002.

KEY FINDING: THE BENEFIT OF CONTAINMENT

Further minimizing HFC emissions can be achieved in all sectors by improved containment during use, reducing the charge in equipments and end of life recovery, recycling or destruction.

EFCTC Comment: Measures such as those proposed by the draft EU F-Gas Regulation, which focus on containment, are supported as an effective means of delivering HFC emission reductions.



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Because of improved containment much of the HFC used in refrigeration and air-conditioning systems is held in equipment and this 'bank' of refrigerant is expected to increase.

The Report takes this improvement into account as part of the HFC contribution to direct radiative forcing. This gives a clear perspective of the contribution of HFCs towards reducing overall global warming.

KEY FINDING : THE IMPORTANCE OF ENERGY EFFICIENCY

GHG emissions related to energy consumption can be significant over the lifetime of appliances considered in this report. Energy efficiency improvements can thus lead to reductions in indirect emissions from these appliances.

Actions to reduce greenhouse gas emissions based only on HFCs have a limited impact. Greenhouse gas emissions related to energy consumption may be reduced significantly for refrigeration and air-conditioning applications, as well as improved insulation using HFCs.

EFCTC Comment: Besides being profitable, energy efficiency improvements can have a major impact on reducing greenhouse gases emissions. Industry is working to deliver these improvements using HFCs, achieving much improved efficiencies compared to 5 years ago.

OTHER FINDINGS

The Report draws attention to high future emission out of CFC and HCFC banks as there are no regulatory obligations (except for some countries) to restrict emissions from banks.

It identifies also opportunities for increased use of alternatives substances with zero or very low GWP (NH₃, CO₂, Hydrocarbons etc) as well as "not-in-kind" technologies.

The study also proposes promoting more end-of-life recovery, recycling and destruction of substances, increasing the use of ammonia and other alternative substances with a lower or zero global warming potential and using various emerging technologies that avoid gases that deplete ozone or contribute to climate change.

The [GWPs](#) of the most important Fluorocarbons (CFCs, HCFCs, HFCs) have been reevaluated and compared with the GWPs used under the UNFCCC. This table will be published on the EFCTC Website.



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THE NEED FOR A SPECIAL REPORT (MONTREAL AND KYOTO PROTOCOLS LINKS)

HFCs, since they have no Ozone Depletion Potential (ODP), are essential to replace CFCs and HCFCs, which are ozone-depleting substances. However, despite the fact that CFCs and HCFCs are also greenhouse gases, they are excluded from the scope of the Kyoto Protocol - because they are already covered by the [Montreal Protocol](#), although the GWP of CFCs is in general much greater than for the HFCs used to replace them.

EFCTC Comment : Scientific reports like the IPCC TAR do not make this distinction and cover ALL gases which can have a climate impact, but this is not the case for political agreements.

HFCs and PFCs were included in the 1992 UN Framework Convention on Climate Change (UNFCCC) and in its 1997 [Kyoto Protocol](#).

EFCTC Comment : Since CFCs are not included within the Kyoto Protocol, the large reduction in climatic impact brought by substituting them with HFCs is not generally apparent in debates. CFCs represented nearly 25% of the emissions of greenhouse gases in 1990. So, by assisting in the elimination of CFCs, HFCs will have helped reduce the total greenhouse gas emissions by at least 20%.

In order to resolve this discrepancy, the UNFCCC COP-8 (2002), and the Montreal Protocol MOP-14 (2002), decided that a Report should be drafted by the [IPCC](#), in collaboration with the [TEAP](#), to understand how to manage HFCs and PFCs, used to protect the ozone layer by replacing CFCs, so that they would not contribute to global warming.

EFCTC Comment: The relationship between efforts to protect the ozone layer and to mitigate climate change has already been the subject of a [joint IPCC/TEAP workshop](#), held in Petten, the Netherlands, in May 1999, and by [TEAP's "HFC and PFC Task Force"](#) in October 1999.

THE REPORT PREPARATION

The need for a scientific/technical, policy neutral, comprehensive and complete information document was expressed by all Parties.

Consequently, in its 20th session (February 2003), IPCC approved the [proposal for a Special Report](#) which would cover:

- the relation of ozone layer depletion and global warming
- options for ODS phase out and reducing GHG emissions
- future estimation and availability of HFCs and PFCs

and should take into account environmental, health, safety, availability and technical



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performance, in addition to consideration of direct and indirect greenhouse gas emissions.

The [IPCC Scoping Paper](#) provides a detailed overview of the issue, explaining the process, and quoting the UNFCCC and Montreal Decisions.

The Report should cover the main application sectors using ODS and their HFC/PFC substitutes: refrigeration, air conditioning, foams, aerosols, fire protection, and solvents. Sector by sector, it would address

- options for reducing halocarbon emissions
- options involving alternative substances
- technologies to address greenhouse gas emissions reduction.

The Report was prepared by IPCC [Working Group I](#) and [Working Group III](#) jointly with TEAP, and is the result of two years of work by 145 experts from 35 countries. The IPCC and TEAP ensured the robustness of the study through a peer-reviewed scientific and technical comprehensive coverage of all aspects of the issue.

The [Summary for Policymakers](#) was approved at the 22nd session of the UNFCCC-SBSTA meeting (April 2005), and will be submitted to the Montreal Protocol 25th Open-ended Working Group, which meets in June 2005. The full report will be published by the same time and will be made available on the [IPCC website](#).

See also the [IPCC Response](#) to points raised by the Environmental NGO MIPIGGS about the Report.

NEW ON OUR SITE

A Table of GWPs from the SROC Report, compared with the GWPs used under the UNFCCC and the Kyoto Protocol.

This table is posted on the [HFC General Properties](#) Page.

LIBRARY: the [Summary for Policymakers](#) of the IPCC "[Special Report on Safeguarding the Ozone Layer and the Global Climate System](#)"