

LEARN ABOUT...

Climate change, global warming & HFCs

Created: September 2015

Updated: January 2016

The contribution of HFCs to European Greenhouse Gas Emissions

Each year, each member state of the European Union submits estimates of its greenhouse gas emissions to the United Nations as part of its commitment to the Rio Convention. The most recent data were submitted in 2014 and cover the years 1990 to 2012. These numbers are added together by the European Environment Agency (EEA) to provide totals for the whole of the EU¹.

All of the conclusions below are based on the EEA numbers and exclude the effect of changes in land use. In this way only social and industrial contributions are considered.

The actual emission estimates are shown in the accompanying graph, covering the years 1990 to 2012. These show a reduction in total greenhouse gas emissions of 24% relative to the baseline years². However, within that reduction individual greenhouse gases have different trends.

Carbon dioxide (CO₂) emissions continue to make the largest contributions accounting for 89% of European greenhouse gas emissions during 2012. Expressed on a common basis (as their carbon dioxide equivalents), methane (CH₄) emissions were 8.8% of the total in 2012, nitrous oxide (N₂O) 7.3%, hydrofluorocarbons (HFCs) totalled 1.9%, perfluorocarbons (PFCs) 0.1% and sulphur hexafluoride (SF₆) 0.1%. Over the period 1990 to 2012 there was a somewhat erratic reduction in CO₂ emissions that averaged 18 million tonnes/year. Methane and nitrous oxide reductions over the period were continuous and smooth, averaging respectively, 9.2 and 7.9 million tonnes of CO₂ equivalent / year. PFC and SF₆ emissions also fell markedly relative to the 1995 baseline but their effect on total emissions was not significant³.

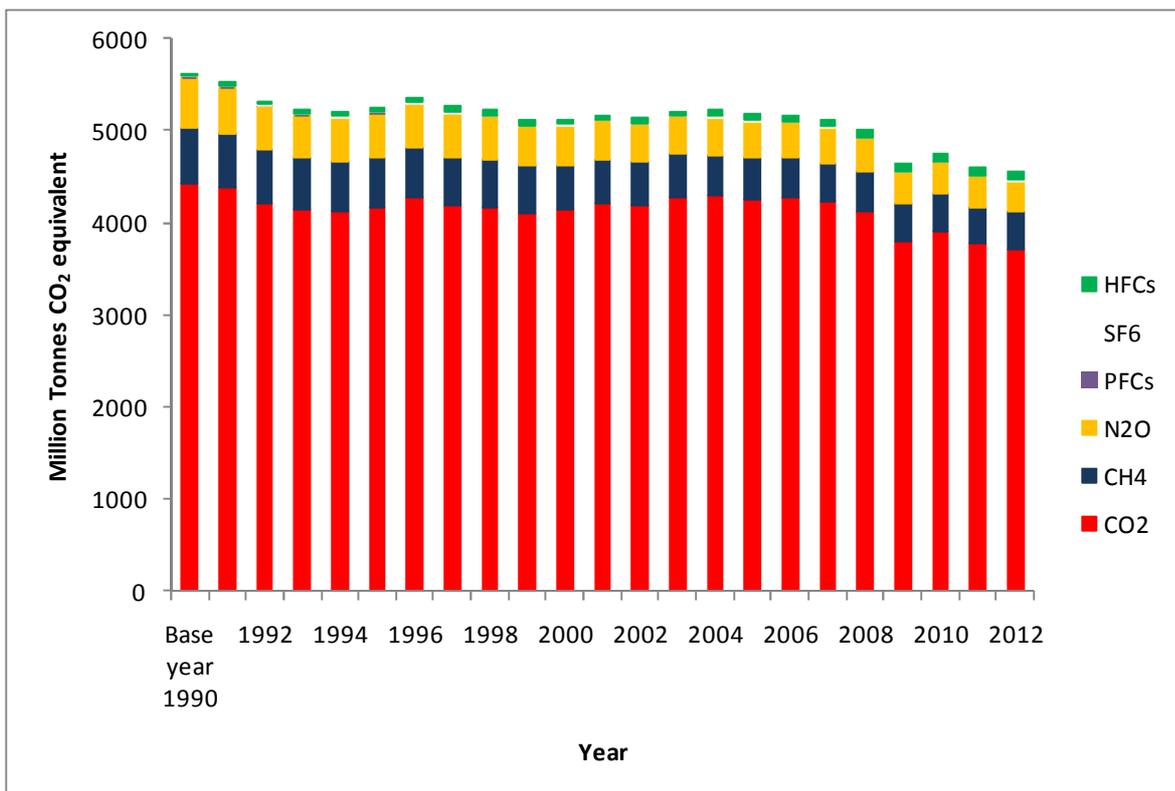
Emissions of HFCs grew, from 1% of the total in 1995 to 1.9 % in 2012 (or by 2.6 million tonnes of CO₂ equivalent / year). This growth in emissions reflects both the part played by HFCs in the global conversion of refrigeration, air conditioning and insulation foam blowing away from CFCs (chlorofluorocarbons) and HCFCs (hydrochlorofluorocarbons) offset to some extent by the steps taken by chemical manufacturers to reduce by-product HFC emissions.

¹ Comprises all 28 members of the current EU for all years.

² Calculated by dividing the total estimated emissions in 2012 by the sum of the emissions of F-gases in 1995 and other greenhouse gases in 1990.

³ Reductions in PFC and SF₆ emissions from their 1995 baselines were 78% and 59% respectively but emissions of these gases amount to 0.2% overall.

It is apparent from the graph that the HFC change is not significant compared to the contributions from other greenhouse gas emissions. Furthermore, the growth in HFC emissions has slowed in recent years; a probable consequence of the controls under F-gas legislation in the EU that date from 2006 [1]. Legislation to phase down F-gas use in the EU, now in effect [2], will ultimately reduce HFC emissions to 20% of their current low level.



European Greenhouse Gas Emissions, expressed on a common basis as equivalent carbon dioxide (CO₂).

References

1. Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases and Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EEC
2. Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006