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### The ozone layer and ozone depletion

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## HFCs and ozone depletion

Over 20 years ago it was established that HFCs have no chemical effect on stratospheric ozone [1]. However, it has been postulated that a potential effect of HFCs on stratospheric temperatures may augment the reactions that deplete stratospheric ozone [2]. The calculations were performed by computer modelling using scenarios of future HFC production and release up to the year 2050.

The scenarios used were those of Velders et al. (2009) [3] which have very large HFC releases up to 2050. These scenarios did not have any constraints on HFC releases, so that not even the original F-gas Regulation and Directive of the EU were considered [4, 5]. The scenarios have been effectively discredited and superseded by more realistic scenarios. These incorporate the revised EU F-gas regulation [6], together with the proposed North American phase-down of HFC use and will result in reduced future emissions of HFCs to the point where they are similar to those envisaged in the scenarios used by climate scientists for the IPCC's 5th Assessment Report [7].

Under the IPCC scenarios accumulation of HFCs in the atmosphere should be reduced by at least 90% from the large emissions assumed by Hurwitz et al (2015)[2]. The change in stratospheric temperature (about 0.02 °K) would then be insignificant compared to natural variation and hence there should be no real effect of HFCs on stratospheric ozone. The theory that HFCs could modify stratospheric temperature sufficiently to accelerate ozone loss to a material extent there is based wholly on out-of-date scenarios.

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