DESTRUCTION OF THE OZONE LAYER

AIR 6

Ozone present in the stratosphere (at altitude between 15 and 50 km) plays an essential role in filtering ultraviolet solar rays, which are harmful to the environment (the collapse of aquatic ecosystems, etc.) and the health of living organisms. Since the entry into force of the Montreal Protocol in 1989, emissions of ozone-depleting substances (ODSs) have fallen sharply.

The "hole in the ozone layer" first appeared above the Antarctic in the early 1980s. It results mainly from the release of halogenated compounds (CFC, HCFC, halons, etc.) into the atmosphere which were frequently and intensively used in a wide variety of applications (refrigeration, air conditioning, insulation, aerosols, etc.).

Fewer ozone depleting agents

The halogenated (mainly chlorinated) compounds in the stratosphere are responsible, *via* complex mechanisms, for the destruction of the ozone layer. The evolution of the total amount of stratospheric chlorine (Cl_y) is monitored by spectrometric measurements of the two main compounds located in this atmospheric zone (HCl and $ClONO_2$)[1]. Measurements made since 1986 indicate a period of sustained growth to peak concentrations in 1995-1996. Since then, a small but significant decrease in Cl_y content has been observed (on average 0.5 (± 0.15)% per year), suggesting that the ozone column will return "to normal" by 2050[2] at our latitudes, despite the slight increase that occurred between 2007 and 2011 as a result of a prolonged slowdown in atmospheric circulation[3].

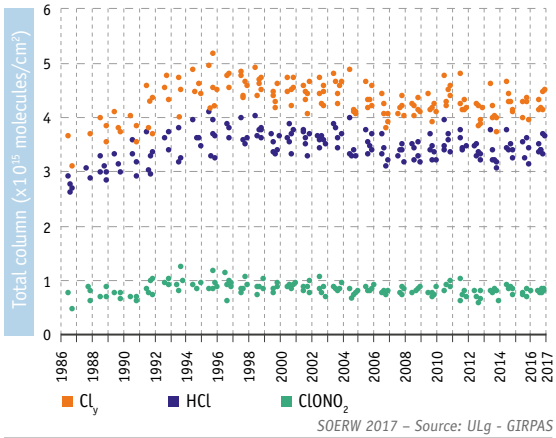
Drastic reduction of ODS emissions

Walloon emissions of ODSs were reduced by 90% between 1995 and 2014. The largest decreases occurred in the field of inhalers (-100%) and refrigeration (-99%)[4]. As a result, an increasing proportion of the total emissions comes from thermal insulation foams, following the slow and gradual release of the CFCs still present in existing insulation panels. However, these emissions are decreasing, following the ban[5] on using CFCs as a blowing agent in this type of foam which has been in place for 20 years.

The good results achieved by Wallonia are mainly due to compliance with the obligations of the Montreal Protocol and its amendments and adjustments, which are translated into European law in the form of successive regulations, the last being Regulation (EC) No 1005/2009. These laws aim to progressively ban and reduce the production and use of ODSs. As a result, Wallonia has adapted its legislation[6,7] and set up various channels for the recovery and elimination of fluorinated gases. This is the case, for example, for CFCs contained in insulating foams and cooling circuits in refrigerators that have reached the end of their useful life (Recupel programme).

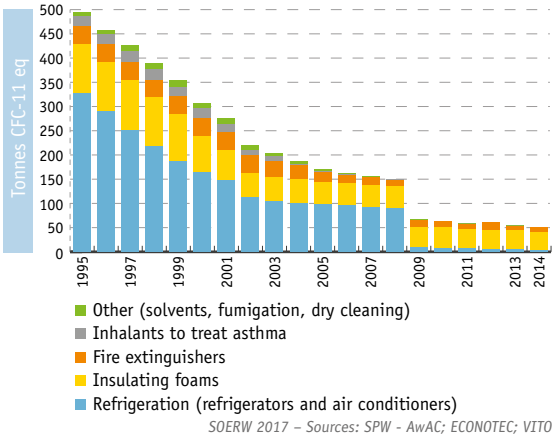
[1] Measurements carried out at the international scientific station in Jungfraujoch in Switzerland | [2] WMO, 2014 | [3] Mahieu *et al.*, 2014 | [4] Emissions of CFCs from domestic refrigerators are considered to be zero as of 2009, with the model assuming that the last refrigerators containing CFCs were sold in 1994 (banning of CFC-11 and CFC-12 in 1995) and that their average life expectancy was 15 years. | [5] Regulation (EC) No 3093/94 | [6] Walloon Government Decree of 12/07/2007 and its amendments, whose main objective was the certification of refrigeration technicians and companies | [7] Walloon Government Decree of 12/07/2007 aimed at operators of refrigeration equipment.

Fig. AIR 6-1 Evolution of chlorine loading in the stratosphere



SOERW 2017 – Source: ULg - GIRPAS

Fig. AIR 6-2 Walloon emissions of ozone-depleting substances



SOERW 2017 – Sources: SPW - AwAC; ECONOTEC; VITO