25 Years of the Montreal Protocol

MONTREAL PROTOCOL
INFORMATION SHEET

20 Years of UNIDO Implementation

Montreal Protocol

The Montreal Protocol calls for the phase out of all ozone depleting substances (ODS), which are used in various applications in our daily lives. Here we exemplify some of these ODS being used in spray cans and fire extinguishers and shed light on the available alternatives, which are zero-ODP and low GWP.

Spray cans

Technically, an **aerosol** is a collection of tiny solid particles or liquid droplets that are finely dispersed in a gas. The aerosols we are familiar with and come across daily are in the form of spray cans, for example for paint, hair products, deodorants, shaving foams, perfumes, insecticides, pharmaceuticals, air fresheners etc. Due to their good dispersion characteristics, good solubility, non-flammability as well as being non-toxic, CFCs (i.e. CFC-11, CFC-12, CFC-114) were the most preferred aerosol propellants. More importantly, they were able to maintain the pressure in cans for longer as they easily evaporate.

In line with the Montreal Protocol, The CFC propellants have mainly been replaced by a mixture of liquefied hydrocarbons gases, i.e. propane, n-butane and isobutane. These have similar characteristics to CFCs but have zero-ODP and low-GWP. However, they are flammable. Safety measures had to be adopted at spray can production sites and consumers have to handle these products accordingly.

UNIDO has been involved in assisting aerosol spray producers to convert to hydrocarbons, since 1995. The majority of these are cosmetics and pharmaceutical companies. UNIDO has assisted over 20 countries in this sector.

Solvents

Solvents are liquids which have the ability to dissolve, suspend and extract materials, without damaging the material itself. Hence, they are used in a variety of cleaning applications: removal of grease from metal parts and circuit boards; removal of paints and coatings; and dry cleaning.They are also employed as process agents, i.e. in the production of agrochemicals, pharmaceuticals, chlorinated polymers and various household and industrial products. The specific solvents, CFC-113, TCA and CTC are ODS and are therefore controlled by the Montreal Protocol. Alternatives to these ozone depleting solvents are: the use of water, alcohols, esters, ketones, hydrocarbons and non-ozone depleting halogenated hydrocarbons and their blends, depending on the application. Manufacturing processes can also be modified is such a way as to omit the use of solvents altogether. UNIDO has been involved in the solvent sector since 1993. Not including the solvent sector components addressed in National ODS Phase-out Plans, UNIDO has assisted over 70 companies in 30 countries.

Fire extinguishers

Halon is widely used to impede the spread of fires in areas where water or solid extinguishing agents may cause additional damage. Halons used for fire and explosion protection are stable, low in toxicity and are non-conductive. However, halons are very potent ozone depleting substances, with ODPs 10-16 times higher than CFCs. Halon-1301 has an ODP of 10; Halon 2402 and Halon 1211 have ODP of 6 and 3 respectively. Like other ODS, halons are halogenated organic compounds, and contain chlorine and bromide atoms. Hence, in compliance with the Montreal Protocol, halon production stopped on January 1, 1994. Therefore, in order to meet the future demand for Halon, recycling and reuse systems have been established worldwide. UNIDO has assisted numerous developing countries to set up Halon-bank management systems, to eliminate controllable emissions.

KEY: CFC – chlorofluorocarbons · CTC – carbon tetrachloride · HCFC- hydrochlorofluorocarbons · HFC – hydrofluorocarbons · TCA – methyl chloroform · ODP – ozone depleting potential, reference value given as ODP=1.00 for CFC-11 · GWP – global warming potential