Co-benefits of the Montreal Protocol

According to research led by the Netherlands Environmental Assessment Agency, the Montreal Protocol has helped both to reduce global warming and to protect the ozone layer. The study concludes that additional climate benefits of significance in comparison to the Kyoto Protocol reduction target could be achieved by new actions under the Montreal Protocol.

Although ozone ($O_3$) is present in small concentrations throughout the atmosphere, most ozone (about 90%) exists in the stratosphere, in a layer between 10km and 50km above the surface of the earth. This ozone layer performs the essential task of filtering out most of the sun's biologically harmful ultraviolet (UV-B) radiation. In 1985, scientists identified a thinning of the ozone layer over the Antarctic during the spring months which became known as the "ozone hole". Chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODSs) are now recognised as the main cause of the observed depletion of the ozone layer. In 1987, the Montreal Protocol on Substances that Deplete the Ozone Layer provided a mechanism to reduce and phase-out the global production and consumption of ODSs. These substances are also greenhouse gases that can contribute to global warming (their current contribution is about 20% of that of carbon dioxide, $CO_2$).

For the first time, scientists from the Netherlands and the United States have calculated in detail the contribution to climate protection made by the phasing out and reduction of ODSs. The researchers point out that repair of the ozone layer is not the only benefit emerging from the Montreal treaty. They observed that without the reductions achieved under the Montreal Protocol, the amount of heat trapped due to ODSs would be about twice as high as present levels. Furthermore, they calculated that, over the period 1990 to 2010, the level of reductions will also equate in climate terms to the equivalent of eight Gigatonnes of carbon dioxide a year. This reduction, most of which has already occurred, is substantially greater than the first Kyoto reduction target (cuts in greenhouse gases that will be equal to two Gigatonnes annually over the same period if the target was met).

Additional climate benefits that are significant compared with the Kyoto Protocol reduction target could be achieved by actions under the Montreal Protocol. These actions include:

- Destroying CFCs present in existing applications (refrigerators, foams).
- Limiting the production of not fully halogenated fluorocarbons (HCFCs), which are used as a substitute due to their lower ozone depletion potential. Nevertheless, the acceleration of the phasing-out of HCFCs might result in an increase in the use of HCFs (hydrofluorocarbons), which is one of the six key greenhouse gases included in the Kyoto Protocol. In order not to offset the potential benefits of the phase-out of HCFCs, refrigerant containment and service practices would need to be improved to reduce emissions in these systems.
- Implementing alternative gases with lower global warming potentials.

Overall, this study shows that when the climate dimension is taken into consideration, the Montreal Protocol, which is already considered to be a highly-effective treaty that is achieving its objective, is even more cost-effective because of this collateral climate benefit.

In the European Union, Regulation (EC) No 2037/2000 is the legislative instrument to phase-out ODS. The Regulation includes controls on production, importation, exportation, supply, use leakage and recovery of controlled substances. It also establishes a licensing procedure for all imports of ODS.

Contact: guus.velders@mnp.nl
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