

IMPROVEMENT IN CLIMATE FORCING FROM MONTREAL PROTOCOL GASES

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This year of 2007, an important milestone for CO₂ measurements, marks the 30th anniversary of the beginning of nitrous oxide (N₂O) and chlorofluorocarbons (CFCs) measurements by NOAA ESRL scientists at the Mauna Loa Observatory. The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, which effectively controls emissions of the CFCs, halons, halocarbon solvents, hydro-CFCs or HCFCs, and methyl bromide, was a landmark international agreement that not only controlled the emissions of halocarbons that contributed to the Antarctic Ozone Hole, but had the additional benefit of reducing the emissions of potent greenhouse gases. The CO₂ equivalent reduction in emissions of the Montreal Protocol gases is ~ 8 Gt CO₂-eq yr⁻¹ (2.2 Gt C-eq yr⁻¹) between 1990 and 2010. This is four times larger than the reduction in greenhouse gas emissions targeted in the first commitment period of the Kyoto Protocol, which includes CO₂, CH₄, N₂O, SF₆, hydrofluorocarbons or HFCs, and perfluorocarbons or PFCs. Over the past couple of years, the atmospheric concentrations of two key halocarbon gases (CFC-12 and halon-1211) have leveled off in the atmosphere. It is important to continue to monitor non-CO₂ greenhouse gases (includes Montreal Protocol Gases, HFCs, CH₄, N₂O, and PFCs) in the future, because reducing emissions of these gases may prove to be less difficult in the short term than reducing CO₂ emissions, which will involve major changes in our energy use and the economy.

Figure 1 Atmospheric trends of two important greenhouse gases, CFC-12 and HFC-134a at Mauna Loa