

The ozone layer, a vital shield protecting our planet from harmful UV radiation, is recovering thanks to sustained global efforts. A United Nations (UN) study titled 'Scientific Assessment of Ozone Depletion: 2018', reveals that the depletion, caused by the release of harmful chemicals, has been reversed and is now recovering at a rate of 1-3% per decade.

World Ozone Day and its Significance

The international community celebrated World Ozone Day on September 16, 2018, with the theme 'Keep Cool and Carry on: Montreal Protocol.' It's a motivational call to continue and intensify the exceptional work done under the Montreal Protocol to safeguard the ozone layer and climate. The theme suggests dual implications - the protection of the ozone layer is also a measure for climate protection and the Montreal Protocol demonstrates an immensely successful treaty.

The Historical Background

In 1985, the Vienna Convention for the Protection of the Ozone Layer was established as an international agreement in which UN members pledged to prevent damage to the stratospheric ozone layer. The Montreal Protocol on Substances that Deplete the Ozone Layer and subsequent amendments were later enacted to regulate and control the production and consumption of human-made ozone-depleting substances (ODSs) and certain hydrofluorocarbons (HFCs). These efforts aimed to address ozone depletion caused by various emissions and stimulate the development of substitute substances in several industrial sectors.

Ozone Depleting Substances	Lifetime
Chlorofluorocarbons (CFCs)	Greater than 100 years
Bromine containing halons and methyl bromide	Variable
Hydrochlorofluorocarbons (HCFCs)	Variable
Carbon tetrachloride (CCl ₄)	Variable
Methyl Chloroform	Variable

Findings from the Study

The study found long-term decreases in the atmospheric abundance of controlled ozone-depleting substances leading to ongoing recovery of stratospheric ozone. The Antarctic ozone hole continues to exist but is also recovering. The Montreal Protocol has successfully mitigated severe ozone depletion in the polar regions. The Kigali Amendment, adopted in 2016, will phase down the production and consumption of some HFCs, thus preventing a significant global temperature increase and associated climate change. However, there has been an unexpected rise in global total emissions of CFC-11.

Future Predictions

The UN study predicts that the Antarctic ozone hole will gradually close by the 2060s, returning to its 1980s levels. Northern Hemisphere and mid-latitude ozone should fully recover by the 2030s, with the Southern Hemisphere following in the 2050s and polar regions by 2060. It's noteworthy that the study claims a visible decline in the size and depth of the Antarctic ozone hole since 2000 for the first time.

Kigali Amendment to Montreal Protocol

On October 15, 2016, under the United States' leadership, 197 countries adopted an amendment in Kigali, Rwanda, to phase down HFCs under the Montreal Protocol. This legally binding amendment aims to cut the production and consumption of HFCs by more than 80% by 2047. As HFCs do not deplete the ozone layer, they are currently used as replacements for HCFCs and CFCs in air conditioning, refrigeration, and foam insulation. However, they're powerful greenhouse gases. The Kigali Amendment will come into effect from January 1, 2019. It outlines reductions in HFC consumption beginning in 2019 for developed countries, a freeze in consumption for most developing countries in 2024, and a similar freeze for certain countries with unique circumstances, like India, in 2028. Additionally, it provides financial assistance to help some countries transition to climate-friendly alternatives.