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World Ozone Day 2026: Global action for a cooler planet

Every year on 16 September, World Ozone Day commemorates the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, ultimately signed by every country in the world. This protocol is crucial to control the production and use of ozone depleting substances (ODSs) such as chlorofluorocarbons (CFCs) and other substances that replaced CFCs. The continuous monitoring of ozone has played a key role in evaluating the effectiveness of the Montreal Protocol and supporting its evolution through successive adjustments and updates, including the Kigali Amendment signed in 2016.

This year's theme, "Global action for a cooler planet", celebrates 10 years of the Kigali Amendment, which called for the phased-reduction of hydrofluorocarbons (HFCs). It is well established that the Montreal Protocol has greatly reduced not only past and future ozone depletion but also the global warming impact of ozone depleting substances. The HFCs are substances that were used as replacements for the CFCs and subsequent HCFCs (hydrochlorofluorocarbons) that have also been phased out by the original Montreal Protocol. Although those HFCs do not deplete the ozone layer themselves, unlike CFCs and HCFCs, they are known as very powerful greenhouse gases and thus contributors to climate change. As global temperatures continue to rise and demand for cooling systems accelerates, sustainable approaches are more important than ever. The Kigali Amendment plays a critical role in this effort by driving the phasedown of these potent greenhouse gases while promoting energy efficient technologies, strengthening industrial capacity, and supporting innovation across the cooling sector.

In the most recent (tenth) WMO/UNEP Scientific Assessment of Ozone Depletion (2022, <https://library.wmo.int/idurl/4/58360>), it was estimated that the implementation of the Kigali Amendment avoids 0.3–0.5°C of future warming by 2100. These quadrennial major assessments have been prepared by the Scientific Assessment Panel as direct scientific input to the Montreal Protocol process. The 2022 assessment also showed that HFCs, HCFCs, and some CFCs still used as feedstock chemicals continue to contribute to global warming and are being emitted in larger amounts than expected. At the end of this year, the 2026 Ozone Assessment report is expected to appear.

In the context of the "Global action for a cooler planet" theme, it should be noted that ozone in the troposphere acts as both a pollutant and a greenhouse gas itself. An international activity of the International Global Atmospheric Chemistry Project (IGAC), the Tropospheric Ozone Assessment Report (TOAR) aims at producing an updated assessment of tropospheric ozone's global distribution and trends from the surface to the tropopause in its second phase (2020–2026). Analyses and results have been published in almost 60 papers, collected in a TOAR-II Copernicus Community Special Issue (https://acp.copernicus.org/articles/special_issue1256.html). Tropospheric ozone has generally

increased relative to levels observed 30–40 years ago, but recent trends vary substantially by region and altitude. Close to the surface, ozone concentrations have declined in Europe and North America following emission controls for air quality regulations, while increases persist in several regions of Asia. Higher in the free troposphere, widespread increases are observed in many regions over recent decades. This reflects the influence of long-range transport, global changes in precursor emissions (especially methane concentrations), and stratosphere-troposphere exchange, resulting in more uniform large-scale trends. Overall, TOAR highlights the importance of regional emissions, and climate variability in shaping ozone levels.

As we mark World Ozone Day 2026, the success of the Montreal Protocol and its Kigali Amendment demonstrates what can be achieved when science, policy, and international cooperation work together. Sustained observations and scientific assessments remain essential to track progress, identify emerging challenges, and inform future action to protect both the ozone layer and our climate.