The Montreal Protocol 1987:

The Montreal protocol is a model of cooperation. It is a product of the recognition and international consensus that ozone depletion is a global problem, both in terms of its causes and its effects. The protocol is the result of an extraordinary process of scientific study, negotiations among representatives of the business and environmental communities, and international diplomacy. It is a monumental achievement.

The Montreal Protocol, finalized in 1987, is a global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances (ODS). ODS are substances that were commonly used in products such as refrigerators, air conditioners, fire extinguishers, and aerosols. The Montreal Protocol has proven to be innovative and successful, and it is the first treaty to achieve universal ratification by all countries in the world. Leveraging this worldwide participation, the Montreal Protocol has spurred global investment in alternative technologies, many developed by U.S. companies, and placed the ozone layer, which was in peril, on a path to repair.

The ozone layer filters out harmful ultraviolet radiation, which is associated with an increased prevalence of skin cancer and cataracts, reduced agricultural productivity, and disruption of marine ecosystems. The United States ratified the Montreal Protocol in 1988 and has joined all five of the Protocol's subsequent amendments. The United States has been a leader within the Protocol throughout its existence and has taken strong domestic action to phase out the production and consumption of ODS such as chlorofluorocarbons (CFCs) and halons. The phasing out of ODS prevented up to an additional 2.5°C temperature increase by the end of this century while also protecting humans from harmful ultraviolet radiation. With full implementation of the Montreal Protocol, the U.S. Environmental Protection Agency (EPA) estimates that Americans born between 1890 and 2100 are expected to avoid 443 million cases of skin cancer, approximately 2.3 million skin cancer deaths, and more than 63 million cases of cataracts, with even greater benefits worldwide. The Montreal Protocol's Scientific Assessment Panel estimates that with implementation of the Montreal Protocol we can expect near complete recovery of the ozone layer by the middle of the 21st century.

The United States was instrumental in negotiating the Montreal Protocol. In the 1970s, evidence began to surface that CFCs, which were used in everyday household products such as air conditioners and

refrigerators, were depleting the Earth's protective ozone layer and increasing the level of ultraviolet radiation reaching our planet's surface. The United States, along with allies and stakeholders, advocated for strong controls on the production and consumption of ODS, promoted international cooperation, and built consensus to phase out ODS. The U.S. Senate unanimously approved U.S. ratification of the Montreal Protocol in 1988, and the treaty has continued to receive bipartisan support for more than thirty years. Over its history, the Montreal Protocol has received support from the vast majority of U.S. industry as well as environmental advocates.

The full text of the Protocol, information on its institutions and past actions, and related publications are available through the **UN Environment Montreal Protocol Ozone Secretariat** website.

KIGALI AMENDMENT TO THE MONTREAL PROTOCOL

In 2016, Parties to the Montreal Protocol adopted the **Kigali Amendment** to phase down production and consumption of hydrofluorocarbons (HFCs) worldwide. HFCs are widely used alternatives to ODS such as hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs), which are already controlled under the Protocol. HFCs are powerful greenhouse gases, and global implementation of the Kigali Amendment is expected to avoid up to half a degree Celsius of temperature rise by 2100.

The United States played a crucial leadership role in the adoption of the Kigali Amendment in 2016. Extensive U.S. diplomacy in the years leading up to the Amendment's adoption created the international political support needed to reach a consensus to add phase down obligations on HFCs to the Montreal Protocol. The United States **ratified** the Kigali Amendment in 2022.

This amendment creates market certainty and opens international markets to new technology that is better for the environment, without compromising performance. It calls on all countries to gradually phase down their production and consumption of HFCs in the coming decades using the flexible, innovative, and effective approaches the Montreal Protocol has used for over three decades. Global stakeholders endorsed adoption of the Kigali Amendment, including the major U.S. companies working in related sectors. The HFC phasedown also presents an opportunity for countries to maximize the Kigali Amendment's benefit by improving energy efficiency in refrigeration and air conditioning. UNEP estimates that this could as much as double the benefit of the Kigali Amendment.

ADDITIONAL RESOURCES

Further information on the science of the Stratospheric Ozone Layer can be found on the National Aeronautics and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA) websites, and information on the U.S. domestic implementation of the Montreal Protocol can be found on the U.S. Environmental Protection Agency (EPA) website.