



**BACKGROUNDERS**  
Press Information Bureau  
Government of India

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## Healing the Skies

### World Ozone Day: From Science to Global Action

#### KEY TAKEAWAYS

- World Ozone Day is celebrated globally on 16 September, and the 2025 theme is **“From science to global action”**.
- India’s proactive measures, including HFC (Hydrofluorocarbon) reduction and the Cooling Action Plan, show leadership in ozone protection.
- The net contribution towards reduction of direct Carbon Di-Oxide (CO<sub>2</sub>) emissions are 42,62,100 MT CO<sub>2</sub> Eq. per year from 2020 and 76,97,600 MT CO<sub>2</sub> Eq. per year from 2023.

#### Introduction

World Ozone Day is observed every year on 16 September to remind us about the ozone layer, which protects life on Earth from harmful ultraviolet rays.

The United Nations started this day in **1994** to celebrate the success of the **Montreal Protocol of 1987**. This agreement came after the **Vienna Convention of 1985**, when scientists warned about the dangers of chemicals called chlorofluorocarbons (CFCs). These steps turned scientific

warnings into global action, and today the ozone layer has started slowly healing.



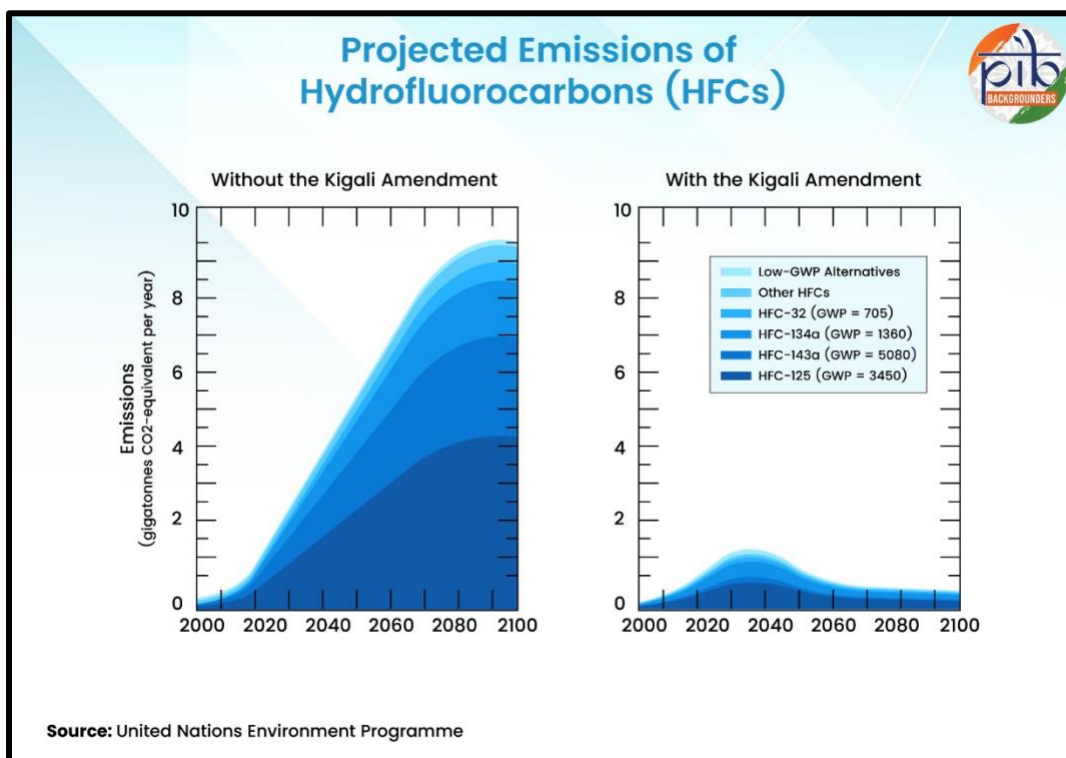
The theme for 2025 World Ozone Day is *“From science to global action.”* It highlights how science alerted the world about the threat of ozone depletion, and how unity among nations led to real progress.

***Every fraction of a degree matters, and every action counts.*** -Antonio Gueterres, UN Secretary General

UN Secretary-General António Guterres said the healing of the ozone layer shows that countries can achieve real progress when they work together and follow science. But he warned that the same urgency is now needed to fight climate change, as the world is close to crossing the **1.5°C warming limit**. He urged governments to cut down harmful cooling gases under the **Kigali Amendment**, which could help prevent up to **0.5°C** of warming by the end of the century.

### Kigali Amendment

The Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer reached agreement at their 28th Meeting of the Parties on **15 October 2016** in Kigali, Rwanda to phase-down **hydrofluorocarbons (HFCs)**.



**The Vienna Convention (1985)** is an international agreement where countries agreed to cooperate and share information to protect the ozone layer from human activities causing its depletion

## Montreal Protocol

The Montreal Protocol, adopted in 1987, is a **global treaty to phase out chemicals that harm the ozone layer**, such as CFCs, halons, carbon tetrachloride, HCFCs, and methyl bromide. It has been ratified by all countries and is considered the most successful international environmental treaty, leading to the global phase-out of major ozone-depleting substances by 2010 and protecting both the ozone layer and the climate system.

### Role of the Global Environment Facility (GEF)

The **Global Environment Facility (GEF)** was created to help developing countries tackle **ozone depletion, climate change, biodiversity loss, and international water issues**. It also supports projects to **phase out ozone-depleting substances** in countries with economies in transition, which are often not eligible for Multilateral Fund assistance. Between **1996 and 2000**, GEF approved over **\$160 million** to assist **17 countries** including Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Additionally, **\$60 million** has been earmarked to help these countries **phase out HCFCs and Methyl Bromide**.

### India's Key Achievements under the Montreal Protocol

India has demonstrated strong commitment to the Montreal Protocol by phasing out key ozone-depleting substances ahead of schedule, establishing robust policies, and taking on a leadership role in global negotiations

- **Early ODS Phase-Out:** Phased out Chlorofluorocarbons (CFCs), Carbon Tetrachloride (CTC), and halons for controlled use by 2010, ahead of Montreal Protocol schedules.
- **Policy Framework:** Enacted Ozone Depleting Substances (ODS) (Regulation and Control) Rules in 2000, banning CFCs and halons in new equipment by **2003**.
- **Global Leadership:** Advocated for developing nations since **1989**, securing the **Multilateral Fund (MLF) in 1990** for technical and financial support.
- **HCFC Phase-Out:** Met 2013 Hydrochlorofluorocarbon (HCFC) freeze and 2015 10% reduction targets under HCFC Phase-out Management Plan (HPMP) Stage-I, phasing out 341.77 Ozone Depleting Potential (ODP) tonnes.
- **RAC Servicing:** Trained over 20,000 technicians in the Refrigeration and Air Conditioning (RAC) sector under the National CFC Consumption Phase-out Plan (NCCoPP) to shift to non-ODS technologies.

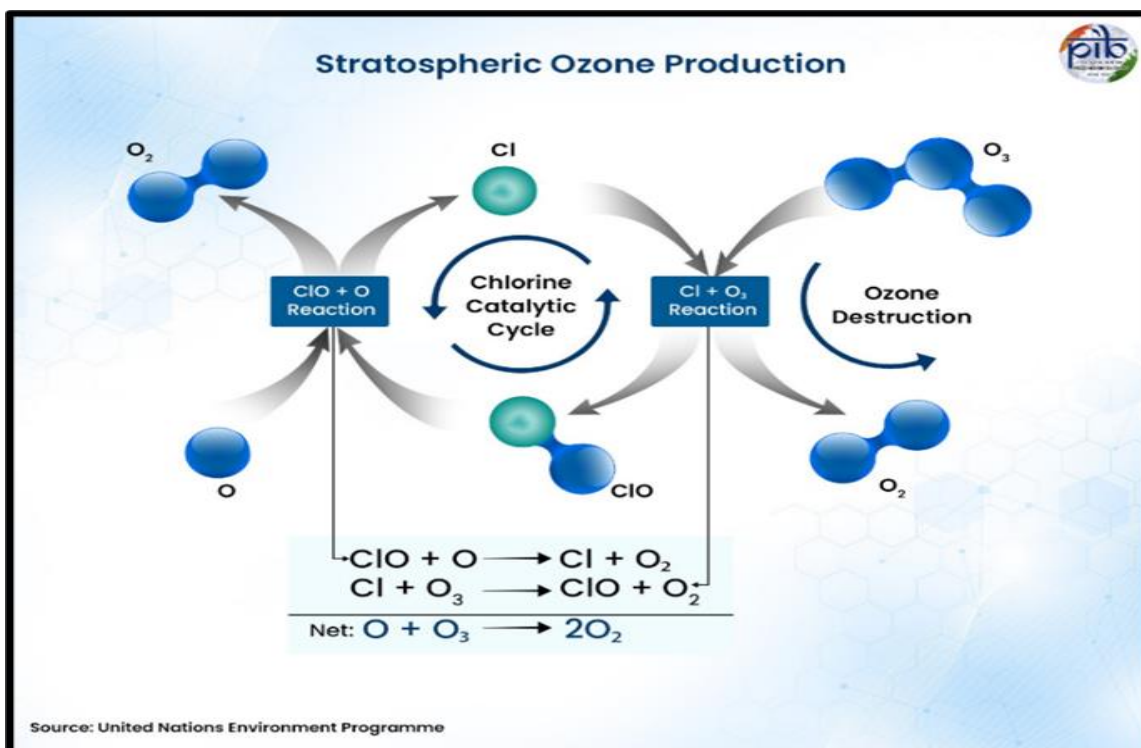
### India – Ahead of Schedule

India proactively **ceased the production and consumption of CFCs from 1st August 2008, 17 months ahead of the Montreal Protocol schedule**, while ensuring the supply of **pharmaceutical-grade CFCs** for asthma and COPD patients during the transition period. By 2010, India was approved for **343.6 MT of pharmaceutical CFCs** for manufacturing MDIs, and by 2011, no CFCs were requested as **CFC-free**

**formulations** were successfully developed and placed in the market. Recognizing India's progress, the **19th Meeting of the Parties (2007)** decided to advance the **phase-out of HCFCs by 10 years**. The **HCFC Phase-out Management Plan (HPMP)** was prepared in close collaboration with industry, research institutions, and other stakeholders, with a **Roadmap launched in 2009** to guide the accelerated phase-out schedule.

## OZONE LAYER

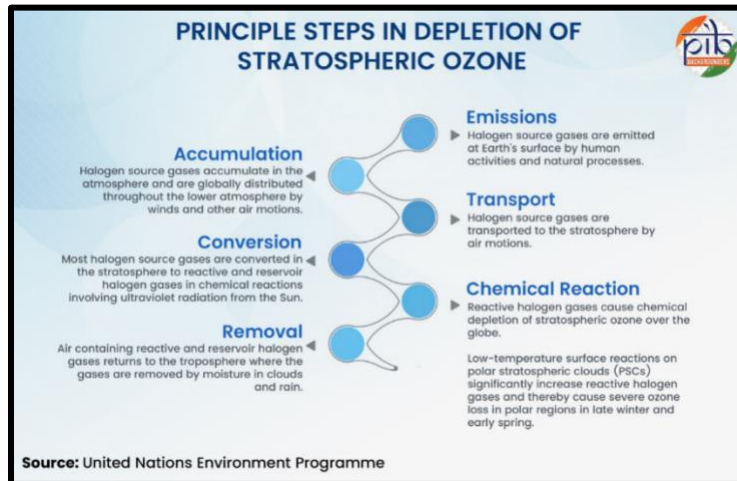
The ozone layer is a part of the stratosphere, found about **15–50 km** above the Earth's surface, where most atmospheric ozone is concentrated. Ozone is a molecule made of three oxygen atoms, and its special property allows the **ozone layer to act like Earth's sunscreen**. It **absorbs most of the Sun's ultraviolet (UV) rays, especially UV-B, which can cause skin cancer, cataracts, damage to crops, materials, and marine life**. Without the ozone layer, life on Earth could not have developed as it has.



## Causes of Ozone Depletion

Ozone depletion is mainly caused by human-made chemicals such as **chlorofluorocarbons (CFCs), halons, carbon tetrachloride, methyl chloroform, and methyl bromide**. These substances are very stable and do not dissolve in rain, so they reach the stratosphere, where strong UV radiation breaks them down and releases chlorine or bromine. **A single chlorine atom can destroy over 100,000 ozone molecules**, reducing ozone faster than it can be naturally replaced. About **85%** of the chlorine in the stratosphere comes from these man-made chemicals, while natural sources contribute only a small part.

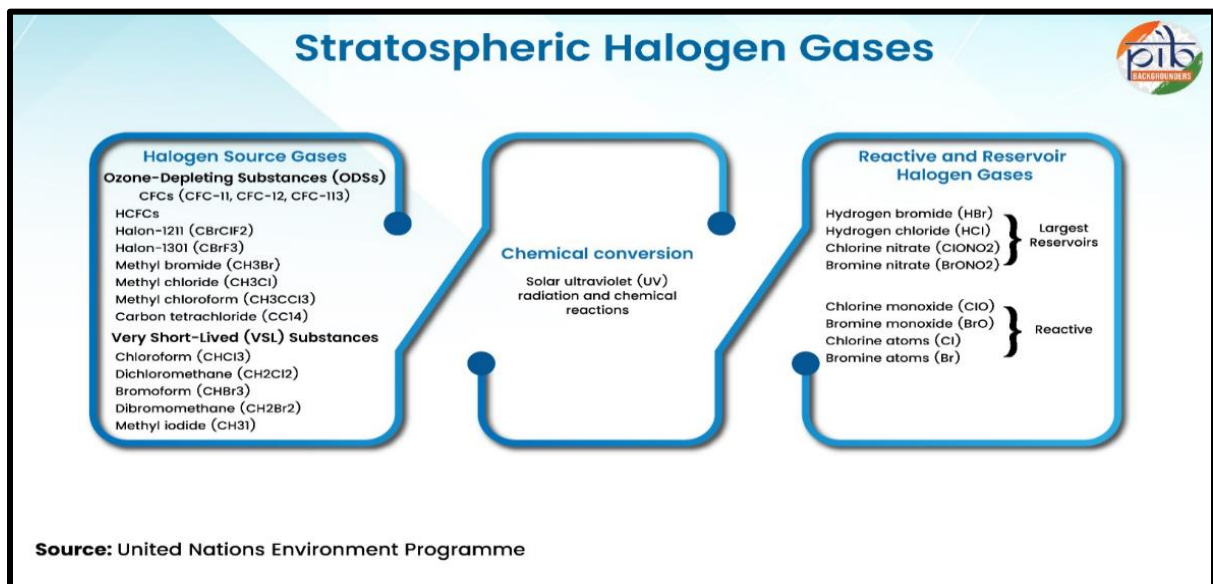
Volcanic eruptions can also worsen ozone loss by releasing aerosols, which make chlorine from CFCs more effective at destroying ozone.



## Environmental Effects of Ozone Depletion

Ozone layer depletion intensifies harmful ultraviolet (UV) radiation, triggering a cascade of environmental effects across human health, agriculture, ecosystems, animals, and materials.

- **Human Health Risks:** Ozone depletion increases UV radiation, raising risks of skin cancer, sunburn, premature skin aging, cataracts, blindness, and weakened immune systems. **A 1% ozone decrease boosts harmful UV by ~2%, potentially causing 2 million new cataract cases yearly.**



- **Agricultural Impacts:** Higher UV levels harm crops like rice, wheat, corn, and soybeans, reducing growth, photosynthesis, and flowering. **A 1% UV-B increase could cut food production by 1%, significantly affecting India's agriculture.**

- **Marine Life Damage:** Increased UV threatens plankton, disrupting aquatic food chains. Young fish, shrimp, and crab larvae face risks, potentially reducing fish yields and ocean biodiversity.
- **Animal Health:** UV overexposure may cause eye and skin cancers in domestic and marine animals, especially under the Antarctic ozone hole.
- **Material Degradation:** UV radiation damages wood, plastic, rubber, fabrics, and construction materials, leading to costly replacements or protection measures.



## Ozone-Depleting Substances and Their Industry Uses

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Chemical	Sector / Use	Atmospheric Lifetime	Phase-Out Status
<b>Chlorofluorocarbons (CFCs)</b>	Aerosols, sterilant for medical equipment, food freezing, tobacco expansion, fumigation, cancer therapy, foams (polyurethane, phenolic, polystyrene, polyolefin), ACs, refrigerators, spray cans	50-1,700 yrs	Fully phased out
<b>Carbon Tetrachloride</b>	Feedstock for CFC-II & CFC-12, pharmaceuticals, agricultural chemicals, solvents	42 yrs	Controlled
<b>Bromofluorocarbons (Halons: 1211, 1301, 2402)</b>	Fire industrial, marine, defense, extinguishers, commercial, aviation sectors	65 yrs	Phased out
<b>Hydrochlorofluorocarbons (HCFCs, e.g., HCFC-22)</b>	Refrigeration, air-conditioning, foam, solvent, aerosol, fire-fighting sectors, feedstock for chemicals	1.4-19.5 yrs	Being phased out
<b>Bromomethane (Methyl Bromide, CH<sub>3</sub>Br)</b>	Agriculture fumigation, pest control in structures and stored commodities, quarantine treatments	0.7 yrs	Controlled use only
<b>Trichlorotrifluoroethane (CFC-113)</b>	Industrial solvents, metal degreasing, electronic assembly cleaning, coatings, adhesives, dry cleaning	-	-
<b>1,1,1-Trichloroethane (Methyl Chloroform)</b>	Industrial solvents, general metal cleaning	5.4 yrs	Phased out
<b>Bromochloromethane (BCM)</b>	Industrial solvent applications	N/A	Immediate phase-out
<b>Hydrobromofluorocarbons (HBFCs)</b>	Limited use	Varies	Prevent new use

Source: PIB

## India's Initiatives in Addressing Ozone Depletion

India has undertaken proactive initiatives to combat ozone depletion, focusing on sustainable cooling, phasing down harmful refrigerants, strengthening infrastructure, and raising public awareness.

- **India Cooling Action Plan (ICAP):** It was launched in **2019** and is world's first cooling action plan, targeting a 20-25% reduction in cooling demand, 25-40% in energy use, and 25-30% in refrigerant demand by **2037-38**. It promotes energy efficiency and low GWP technologies in the RAC sector.
- **HFC Phase-Down Strategy:** India's National Strategy for HFC phase-down, finalized in 2023, prioritizes sectors based on HFC use and low GWP alternatives, aligning with Kigali Amendment goals.
- **Thematic Working Groups:** Six groups focus on space cooling, cold chain, RAC servicing, refrigerant demand, and R&D to implement ICAP, enhancing cooling efficiency and infrastructure.
- **Awareness Efforts:** Ozone Cell's campaigns use multilingual videos and social media (YouTube, Facebook, X) to educate on ozone depletion and ODS phase-out.

## Individual Actions to Protect the Ozone Layer

Individuals can play a vital role in protecting the ozone layer by adopting ozone-friendly practices at home, in agriculture, in technical services, and as informed consumers and citizens.

- **Ozone-Friendly Consumer:** Buy "CFC-free" or "ozone-friendly" products like refrigerators, air conditioners, and aerosols, and verify with sellers.
- **Ozone-Friendly Homeowner:** Dispose of old appliances responsibly, ensuring Chlorofluorocarbons (CFCs)/Hydrochlorofluorocarbons (HCFCs) are removed, and recycle halon fire extinguishers.
- **Ozone-Friendly Farmer:** Switch from methyl bromide to safe alternatives like integrated pest management for soil fumigation.
- **Ozone-Friendly Technician:** Recover refrigerants from Refrigeration and Air Conditioning (RAC) units without venting, check for leaks, and promote recycling programs.
- **Ozone-Friendly Citizen:** Learn about ozone depletion effects and national Montreal Protocol strategies, and engage with your National Ozone Unit (NOU).

## Conclusion

World Ozone Day reminds us that **global cooperation and science-led action** can achieve remarkable results. **The recovery of the ozone layer shows that when nations unite, progress is possible, as demonstrated by the Montreal Protocol.** India's proactive measures, early phase-outs, and sustained commitment reflect how countries can contribute to both **environmental protection and climate action.**



As we face new challenges like climate change, every action matters—by continuing to reduce ozone-depleting and greenhouse gases, we can protect our planet and ensure a healthier, safer future for generations to come.

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### **Ministry of Environment, Forest and Climate Change**

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