



# Ecological Ways to Cut Down on Ground Level Ozone Depletion

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## INTRODUCTION

Ozone, a molecule made up of three oxygen atoms, is frequently praised for its ability to filter harmful Ultraviolet (UV) radiation from the stratosphere, therefore protecting life on Earth. On the other hand, ground-level ozone, often referred to as tropospheric ozone, is present in the lower atmosphere and poses a complicated problem. The purpose of this article is to explore the dual nature of ozone, both its advantages in the stratosphere and the issues it causes below ground.

Numerous environmental issues, such as photochemical smog, acid rain, ozone layer depletion, greenhouse gas effect and climate change, have been connected to atmospheric chemistry. Emissions of polluting gases into the atmosphere are common during residential, industrial and agro-allied activities. The sulphur oxides (monoxides, dioxides and hexafluoride), hydrogen sulphide, carbon (carbon dioxide, carbon monoxide), nitrogen (nitrous oxide), perfluorocarbons, hydrofluorocarbons, etc., are a few of the noteworthy gases. Furthermore, among the greenhouse gases and particles included in flared gas are sulphur dioxide, carbon dioxide, methane, benzopyrene, toluene, xylene and hydrogen sulphide.

## DESCRIPTION

Furthermore, partial combustion of hydrocarbons, such as gas flaring, wood biomass burning and fossil fuel combustion, can produce carbon monoxide, while incomplete combustion of crude oil yields volatile organic compounds and polycyclic aromatic hydrocarbons. Gases, particulates and their derivatives can enter the body through the skin, inhalation and absorption into bodily tissues. They can also interact with external organism tissues, posing a health concern to people living in contaminated areas. The ozone layer aids in preventing or insulating the sun's harmful UV rays.

The breakdown of this layer may cause climate change, which would raise temperatures and increase the amount of water bodies (oceans and seas). The Southern ocean and portions of the North Atlantic Ocean (NAO) are predicted to warm the greatest, followed by land and high northern latitudes. According to, sea levels rise in response to temperature increases that melt glaciers, ice sheets and the ocean's surface layer. Except for the crests of Mambila and Jos Plateau, where the mean temperature is roughly 8°C and rainfall fluctuates greatly, Nigeria has high temperatures virtually year-round, with an average of above 24°C.

### Protective ozone layer

The earth's surface is protected from damaging UV-B and UV-C rays by the stratospheric ozone layer, which can have negative impacts on ecosystems, human health and the environment. The significance of this shield was brought to light in the 1980s when the ozone hole above Antarctica was discovered. The ozone layer has recovered as a result of international initiatives like the montreal protocol, which have effectively reduced the manufacturing and use of ozone-depleting chemicals.

### Ground-level ozone

Ground-level ozone depletion has grown to be a serious environmental concern, even while stratospheric ozone depletion is being addressed. It is mostly created by intricate chemical reactions between sunlight, Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx). Some ozone precursors are produced by human activities such car exhaust, industrial pollutants and agricultural practices.

### Health and environmental impacts

Human health is negatively impacted by ground-level ozone exposure at high levels. It can aggravate asthma symptoms,

set off respiratory problems and raise the risk of respiratory infections. Premature death, diminished lung function and cardiovascular issues have also been connected to ozone exposure. Ozone also has a deleterious effect on flora, which results in lower crop yields, damage to forests and ecological imbalances.

#### **Air quality and ozone regulations**

In order to combat ground-level ozone, effective air quality management techniques are needed. Regulations have been put in place by governments all over the world to restrict the emissions of ozone precursors including NO<sub>x</sub> and VOCs. Emission standards apply to automobiles and industrial buildings and attempts are undertaken to minimize pollution from agricultural practices. When there are high ozone occurrences, vulnerable people are protected by air quality alerts and monitoring networks that detect ozone levels.

#### **Balancing ozone and air pollution**

It is difficult to strike a compromise between ozone preservation and air pollution management. Tighter laws aimed at lowering ozone precursors may have negative effects on the economy or energy use. Adopting comprehensive plans that support cleaner technology encourage sustainable practices and account for emissions from multiple sources is vital. To establish this delicate equilibrium, governments, industries and individuals must work together in concert.

#### **Public awareness and individual actions**

It is essential to increase public knowledge of the effects of ground-level ozone. Campaigns for education can assist people in realizing the significance of lowering ozone precursors and adopting preventative actions.

Ozone pollution can be reduced by taking easy steps like taking public transportation, carpooling, cutting back on energy use and staying away from products that contain volatile organic compounds.

#### **Innovation and technology**

Technological developments are essential for tackling ozone-related issues. The development of more eco-friendly and effective agriculture, transportation and industrial activities should be the main goals of research. Ozone precursors can be greatly reduced through enhancing emission control technologies, supporting sustainable urban planning and investing in renewable energy sources.

### **Conclusion**

Benefits and drawbacks of ozone exist both at ground level and in the stratosphere. Although the ozone layer protects humans from UV radiation, ground-level ozone is hazardous to vegetation, ecosystems and human health. Achieving equilibrium between safeguarding the ozone layer and diminishing ground-level ozone pollution necessitates all-encompassing approaches, raising public consciousness, advancing technological developments and cooperative endeavors. We have a shared obligation to protect the ozone layer and the air we breathe by adopting sustainable practices.