

# GREENHOUSE GASES



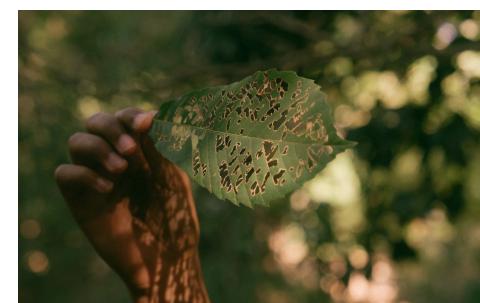


## greenhouse gases



# GREEN HOUSE GASES

Greenhouse gases (also known as GHGs) are gases in the earth's atmosphere that trap heat. During the day, the sun shines through the atmosphere, warming the earth's surface. At night the earth's surface cools, releasing heat back into the air. But some of the heat is trapped by the greenhouse gases in the atmosphere.



[www.greenhousegases.com](http://www.greenhousegases.com)



# Key Green House Gases



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1. Carbon Dioxide (CO<sub>2</sub>): The most abundant greenhouse gas, primarily released from burning fossil fuels (coal, oil, and gas), deforestation, and certain industrial processes.
2. Methane (CH<sub>4</sub>): Released from agriculture (especially livestock digestion), landfills, coal mining, and the production and transport of oil and natural gas.
3. Nitrous Oxide (N<sub>2</sub>O): Emitted from agricultural and industrial activities, as well as combustion of fossil fuels and biomass.
4. Fluorinated Gases: Synthetic gases used in a range of industrial applications, including refrigerants, solvents, and foam-blown agents. These include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
5. Water Vapor (H<sub>2</sub>O): While naturally occurring, water vapor acts as a greenhouse gas by trapping heat in the atmosphere. It is largely controlled by Earth's temperature but can amplify warming due to other greenhouse gases.



# Greenhouse Effect

The greenhouse effect is a process that occurs when gases in Earth's atmosphere trap the Sun's heat. This process makes Earth much warmer than it would be without an atmosphere. The greenhouse effect is one of the things that makes Earth a comfortable place to live.



1. **Solar Radiation:** The Sun emits energy, including visible light, ultraviolet (UV), and infrared (IR) radiation. This energy passes through the atmosphere and reaches the Earth's surface.
2. **Heat Emission:** The Earth's surface emits infrared radiation (heat) back towards space. However, this heat does not all escape directly.
3. **Greenhouse Gas Absorption:** Greenhouse gases like carbon dioxide ( $\text{CO}_2$ ), methane ( $\text{CH}_4$ ), nitrous oxide ( $\text{N}_2\text{O}$ ), and water vapor in the atmosphere absorb much of this outgoing infrared radiation.
4. **Re-Radiation of Heat:** After absorbing heat, greenhouse gases radiate some of it back towards the Earth's surface, causing additional warming.
5. **Warming Effect:** This trapped heat helps to maintain the Earth's average temperature. Without the greenhouse effect, the Earth's average temperature would be about  $33^\circ\text{C}$  ( $59^\circ\text{F}$ ) cooler, making it too cold for most life forms.



# Consequence of increasing GHGS

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**1. Global Warming Rising Temperatures:** Increased GHG concentrations cause more heat to be trapped in the atmosphere, leading to a rise in global average temperatures. This is the primary driver of global warming

**2. Climate Change Changing Weather Patterns:** Higher temperatures disrupt weather patterns, leading to more extreme and unpredictable weather events, such as more intense storms, droughts, floods, and heatwaves.

**3. Sea Level Rise Thermal Expansion and Melting Ice:** As the oceans warm, seawater expands, and melting glaciers and ice caps contribute additional water, causing sea levels to rise. This threatens coastal communities with flooding, erosion, and loss of habitat.

**Displacement of Populations:** Coastal cities and low-lying areas are at risk of being submerged, potentially displacing millions of people, leading to "climate refugees."

**4. Economic Impacts Damage to Infrastructure:** Sea level rise, extreme weather events, and shifting climates can damage buildings, roads, and critical infrastructure, leading to higher repair and adaptation costs.



# STRATEGIES



## 1. Transition to Renewable Energy

**Solar and Wind Power:** Invest in solar panels and wind turbines to replace fossil fuels.

**Hydropower and Geothermal Energy:** Utilize these sustainable energy sources where feasible.

## 2. Enhance Energy Efficiency

**Building Retrofits:** Upgrade insulation, windows, and HVAC systems in buildings.

**Energy-Efficient Appliances:** Promote the use of ENERGY STAR-rated appliances.

## 3. Sustainable Transportation

**Public Transit:** Invest in and promote public transport systems.

**Electric Vehicles (EVs):** Encourage EV adoption through incentives and charging infrastructure.

## 4. Agricultural Practices

**Sustainable Farming:** Implement practices like crop rotation, no-till farming, and organic methods

## 5. Waste Management

**Recycling and Composting:** Promote recycling programs and compost organic waste.

**Waste-to-Energy:** Convert waste materials into energy to reduce landfill use. >



# THANK YOU!

A Pathway to a Greener Future