

The Mechanism of Global Warming

Global warming is a critical issue that stems from the accumulation of carbon in the Earth's atmosphere. This carbon originates from various human activities that release it into the environment, disrupting the natural balance that regulates the planet's temperature.

Sources of Carbon Emissions

The root cause of global warming lies in the release of carbon into the atmosphere. Key contributors to these emissions include:

1. **Burning Hydrocarbons:** Fossil fuels burned in coal power plants and vehicles (cars and trucks) are among the major sources of carbon emissions.
2. **Industrial Activities:** Processes like asphalt road construction and industrial manufacturing release significant amounts of carbon dioxide.
3. **Agriculture:** Methane emissions from livestock waste, often referred to as "cow dung," also add to the carbon burden.

The Earth's Heat Balance

Under natural conditions, the Earth's climate maintains a stable heat balance:

- **During the Day:** The Sun's heat enters the Earth's atmosphere and warms the planet.
- **During the Night:** Heat is radiated back into space, allowing the planet to cool.

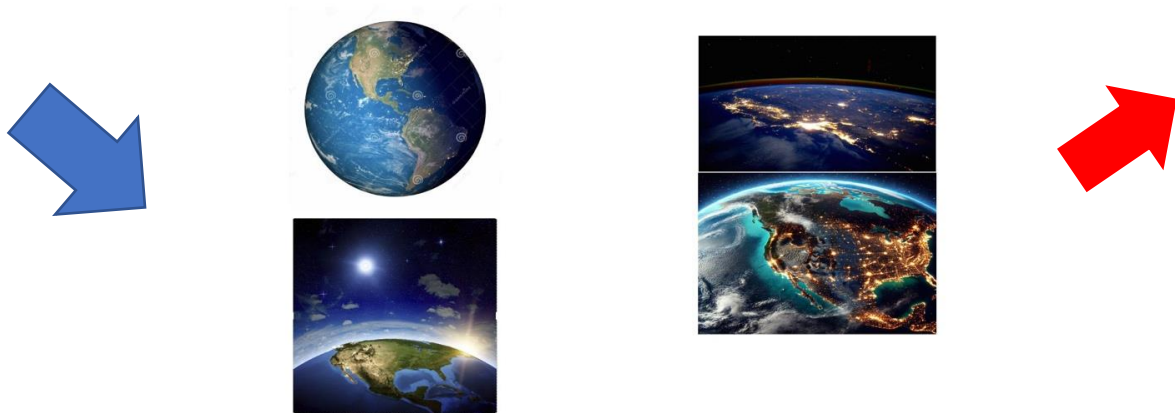
This balance ensures that the Earth's average temperature remains constant over time. However, the presence of excess carbon in the atmosphere disrupts this equilibrium.

How Carbon Causes Warming

Carbon in the atmosphere acts as an insulating layer, partially trapping heat that would otherwise escape into space. Here's how it works:

1. **Daytime Heating:** Solar heat enters the Earth's outer atmosphere without any significant blockage and warms the planet.
2. **Nighttime Radiation Blockage:** During the night, carbon in the atmosphere blocks some of the heat radiation from escaping back into space.

For instance, if Los Angeles County receives 100 units of power (UOP) from the Sun during the day and can only radiate 99 UOP back into space at night due to atmospheric carbon, the remaining 1 UOP contributes to the warming of the atmosphere. Over a decade, this daily accumulation of heat can increase the Earth's average temperature by a measurable amount, such as 1 degree Celsius.



EX: 100 UOP from the sun into LA County, 99 UOP radiated from LA County into space, net heat trapped per 24 hours = 1 UOP.

Wider Impacts of Carbon Accumulation

Beyond temperature increases, carbon in the atmosphere also causes shifts in global weather patterns. For example:

- **Jet Stream Redistribution:** The presence of carbon affects the movement of jet streams, leading to significant changes in weather patterns.
- **Extreme Weather Events:** The recent atmospheric rivers bringing heavy rainfall to California illustrate how these disruptions manifest in tangible ways.

The Urgency of Action

Understanding the mechanism of global warming highlights the importance of reducing carbon emissions. By addressing the root causes, such as reliance on fossil fuels, industrial inefficiencies, and unsustainable agricultural practices, we can work to mitigate the effects of global warming and restore balance to the Earth's climate system.

Collective efforts, sustainable practices, and innovative solutions are essential to ensure a stable and livable climate for future generations.