Journal of Environmental and Occupational Health, 2022
VOL 12, NO. 4, PAGE 186

COMMENTARY

Open Access

Role of Greenhouse Effect in Climate Change

Daniel Jacob*
Department of Earth Sciences, University of Cambridge, Cambridge, England

ARTICLE HISTORY
Received: 21-Mar-2022, Manuscript No. JENVOH-22-62715;
Editor assigned: 23-Mar-2022, PreQC No. JENVOH-22-62715 (PQ);
Reviewed: 07-Apr-2022, QC No. JENVOH-22-62715;
Revised: 12-Apr-2022, Manuscript No. JENVOH-22-62715 (R);
Published: 21-Apr-2022

Description

The greenhouse effect takes place when solar energy passes through a planet's atmosphere and warms its surface, but the environment prevents the heat from returning straight to space, resulting in a warming climate. The Sun's light passes through Earth's atmosphere and warms the planet's surface. Heat is then radiated from the warmed surface, which is absorbed by greenhouse gases like carbon dioxide. The global average temperature would be well below freezing if it weren't for the natural greenhouse effect. Increases in greenhouse gases caused by humans trap more heat, causing the Earth to become warmer over time. The Sun, at about 5,500°C (9,930°F), radiates most of its solar energy as visible and near-infrared light, whereas the Planet's average surface temperature of about 15°C (59°F) emits longer wavelength infrared radiant heat. Most incoming sunlight passes through the atmosphere, allowing its energy to reach the surface. The term "greenhouse effect" comes from a faulty analogy that compares it to transparent glass that allows sunlight into greenhouses, but unlike this effect, greenhouses primarily retain heat by restricting air movement.

The atmosphere is mostly transparent to infrared light, but a small percentage of greenhouse gases make it nearly opaque to wavelengths emitted by the surface. Greenhouse gas molecules absorb and emit infrared light, which causes them to heat up and radiate heat in all directions, warming other greenhouse gas molecules and passing heat to the surrounding air. Radiant heat that travels downwards raises the surface temperature, even more, adding to the energy that travels upwards into the atmosphere. Earth would be more than 30°C (54°F) colder if it didn't have its natural greenhouse effect. The amount of sunlight varies from day to night, season to season, and distance from the equator. Depending on the reflectivity of clouds and the Earth's surface, about half of available sunlight is reflected. Greenhouse gas effects, time in the atmosphere, and altitude are all different, resulting in positive feedback. The Earth's heat engine evens out variations by causing energy flows. Higher layers of the atmosphere eventually emit about as much energy into space as the Sun emits, resulting in Earth's energy balance.

The enhanced (or anthropogenic) greenhouse effect refers to the strengthening of the greenhouse effect as a result of human activities. This increase in radiative forcing from human activity has been observed directly and is primarily due to increased atmospheric carbon dioxide levels. This increase in radiative forcing from human activity has been inferred from measurements by the CERES satellite throughout the twenty-first century. "Atmospheric concentrations of carbon dioxide, methane, and nitrous oxide are unprecedented in at least the last 800,000 years," according to the Intergovernmental Panel on Climate Change's 2014 Assessment Report. Their effects have been detected throughout the climate system, along with those of other anthropogenic drivers, and they are highly likely to have been the dominant cause of the observed warming since the mid-20th century. CO2 is produced by the burning of fossil fuels as well as other activities such as cement manufacturing and tropical deforestation. CO2 concentrations have risen from around 313 parts per million in 1960 to over 400 ppm in 2013, according to data from the Mauna Loa Observatory. The current CO2 level is higher than the geological record maximum (300 ppm) based on ice core data.

Contact: Jacob D, E-mail: jacob1@ed.ac.uk