

GLOBAL WARMING

Global Warming

Previously all climate changes occurred naturally. However, during the Industrial Revolution, we began destroying our environment through changing agricultural and industrial practices. Global warming is the gradual increase in global temperatures caused by the emission of gases that trap the sun's heat in the Earth's atmosphere. Most of the sun's energy that reaches the earth is absorbed by the oceans and land. Some of the energy is radiated back into the atmosphere in the form of heat by atmospheric gases. This process is called **greenhouse effect** (Figure 1). Without the greenhouse gases the surface of the Earth would be as cold as the surface of the Moon (about $-18\text{ }^{\circ}\text{C}$).

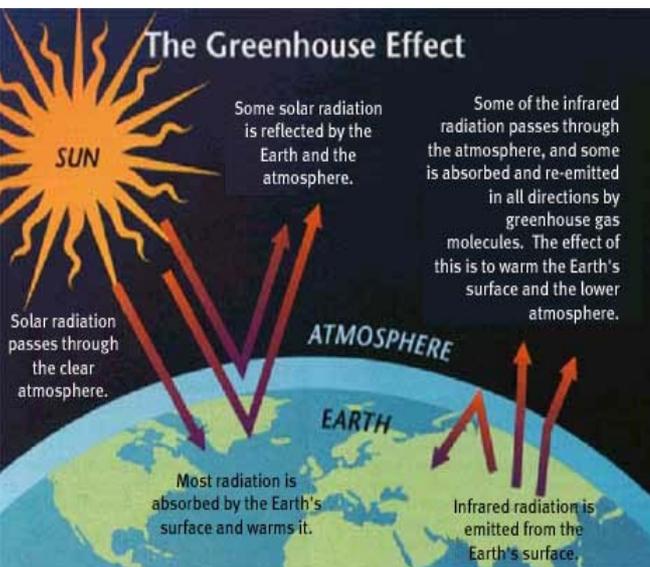


Figure 1:

Source: SafeClimate.net

Greenhouse Gases

Some greenhouse gases (GHGs) occur naturally in the atmosphere. Naturally occurring greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, and ozone. However, due to population growth, fossil fuel burning, and deforestation, we are affecting the natural mixture of gases in the atmosphere. Some human activities add to the levels of most of these naturally occurring gases:

Carbon dioxide (CO_2) is the pollutant most responsible for increased global warming. It is released to the atmosphere when solid waste, wood, fossil fuels (oil, natural gas, and coal) are burned.

Methane (CH_4) mainly emitted as a result of agricultural activities, also from decomposition of organic wastes in municipal solid waste landfills, raising of livestock and transport of coal, natural gas and oil.

Nitrous oxide (N_2O) is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels.

Chlorofluorocarbons (CFCs) a very powerful greenhouse gases that are not naturally occurring usually generated in variety of industrial processes. The main substances for the ozone layer damage.

GHGs remain in the atmosphere for many years after being emitted. Even if we were to start reducing global emissions today, atmospheric CO₂ concentration would continue to rise.

Each greenhouse gas differs in its ability to absorb heat in the atmosphere. Currently, greenhouse gases are measured in units of million of metric tons of carbon equivalents; each gas can then be categorized by its global warming potential (GWP).

Impacts

A warmer Earth may lead to change rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans. The Intergovernmental Panel on Climate Change (IPCC), which formulates strategies to minimize global warming and assesses available scientific information, projects an average global temperature increase of 0.6 to 2.5 °C, and maybe more in the polar regions, over the next fifty years. Some of the possible effects of changing climatic patterns that are caused by global warming include:

- Some areas receiving much higher rainfall at present, resulting in greater flooding. Other areas receiving much less rainfall at present, resulting in drought.
- Changes to patterns of agriculture around the world.
- The increase of sea levels, due to thermal expansion of the oceans.
- The melting of glaciers and polar icecaps.