

## Greenhouse Gases Cause and Effect

Within the past 20 years, scientists have been recording a change in environmental conditions attributed to the concentration of what they call greenhouse gases. Greenhouse gases are most commonly known as the organic gas compound  $\text{CO}_2$  which is the most abundant gas found in the atmosphere, hence scientists have chosen to use this compound as a reference gas when comparing the relative concentration amounts of other atmospheric gases. Scientists also know the expected atmospheric lifetime of  $\text{CO}_2$  gas. By lifetime they mean the duration the gas exists in its stable form in the atmosphere before its chemical breakdown.  $\text{CO}_2$  and other greenhouse gases also have a relative "radiative force" value meaning the amount of heat the gases absorb as the heat leaves the Earth's surface. It must be understood that greenhouse gases are a natural emission from respiration processes in plants and animals, but the concern here is not the natural emissions but those that result from human activity such as emissions resulting from the combustion of fossil fuels such as coal and gasoline, and also resulting from the production of metals and other materials. Many of the greenhouse gases scientists are finding in the atmosphere have longer lifetimes and higher radiative force values than  $\text{CO}_2$ , with the increase in concentration of these gases scientists are concerned that this will present adverse effects with no known remedy to bring conditions back to life-sustaining equilibrium.

One of the first indications that the equilibrium of greenhouse gases has been disturbed by human activity has been the increasing size of holes in the ozone layer in the atmosphere. Ozone is depleted by the presence of halocarbons such as CFCs, flouorocarbons containing the elements chlorine or bromine like those found in aerosol. The presence of ozone is crucial to our existence as it is the atmospheric barrier that protects living beings from harmful ultraviolet rays emitted from the sun. Without ozone, the intensity of the sun's light would increase and essentially burn organic tissues. Another indication of greenhouse gas imbalance is the rise in the Earth's temperature due to the increasing presence of  $\text{CO}_2$  and other heat absorbing atmospheric gaseous compounds. Most people would delight in this idea but there are drawbacks of increasing temperatures such as; rising ocean levels resulting from the melting of polar ice caps, permafrost, and glaciers, climate changes that raise the intensity and frequency of tropical storms, prolonged rain seasons and flooding, and inversely causing prolonged drought or drought in areas that historically have never seen it before. The future of human life is what's at stake here, reason enough to sound the alarm.

## References

Beloit College's Global Warming site: <http://chemistry.beloit.edu/Warming/index.html>

EPA Greenhouse gas inventory executive summary:  
<http://epa.gov/climatechange/emissions/usinventoryreport.html>