

Humans: Are We the Culprits of Carbon Dioxide in the Atmosphere?

RECEIVED OCT 5 2009

Shelby Kramer

Laurel High School

October 4th, 2009

A majority of scientists have acknowledged that the Earth is in fact warming and has warmed about one degree in the past one hundred years. This doesn't seem like much, but the number is staggering and has shocked scientists because of how quickly that temperature change has occurred. Throughout the Earth's history, there have been periods of warming and cooling, but the average change has been one degree per thousand years. This means that the current global warming appears to be happening ten times faster than before. It is the belief of many scientists that this warming is a result of anthropogenic actions (Human Contribution).

The accelerated warming is caused by greenhouse gases that humans are adding to the atmosphere. For many years, coal was considered the primary fuel. It was used not only for manufacturing, but also for everything from heating homes to providing power for railroad trains and steamships. Today, coal's leading use is in making electricity. Oil and natural gas are also used to produce electricity. All fossil fuels release carbon whenever they are burned, but coal has much higher carbon content than either oil or gas. It is believed that coal is a main contributor toward global warming because so much electricity is produced from coal-burning power plants. Each year, about 7 billion tons of carbon is released through the burning of fossil fuels; and when this reacts with oxygen, carbon dioxide is created—more than 20 billion tons of it (Human Contribution).

Along with burning fossil fuels and natural release of carbon dioxide into the air, the destruction of the world's forests creates about 30 percent of all anthropogenic greenhouse gases. Through photosynthesis, living trees breathe in carbon and breathe out oxygen, and when they are cut down, huge concentrations of CO₂ are released into the air. By cutting down and burning forests carbon dioxide and other heat-trapping gases are released into the atmosphere (Human Contribution).

Also, chlorofluorocarbons, usually called CFCs, are created synthetically for use in refrigerators, air conditioners, foam, and insulation products, as well as for propellants in spray cans. CFCs contribute about 20 to 25 percent of the total anthropogenic greenhouse gases. Studies have also connected CFCs

with rapid destruction of the ozone layer. This is especially troublesome to scientists because CFCs remain in the atmosphere for at least one hundred years.

To refute the above claims that anthropogenic carbon dioxide is a major contributor is to state that humans are not the sole contributors to the carbon dioxide in the atmosphere. Along with burning of fossil fuels, carbon dioxide is created naturally when all living things breathe. CO₂ is also formed naturally when living things die and decompose. The carbon that has been stored in the body of the plant, animal, or human is released into the soil over time. These life processes keep carbon dioxide levels in balance. As long as the amount of CO₂ that is added to the air through respiration and decay is the same as the amount that is taken out, that balance is maintained (Human Contribution).

The Earth has been warming since 1910, but the warming may not be manmade. The basic argument that greenhouse gases keep the Earth comfortably warm, has never been challenged, and it follows that an increase in carbon dioxide in the atmosphere undoubtedly produces a rise in temperature at ground level. Today the amount of carbon dumped globally into the atmosphere corresponds, on average, to one ton per person on the planet, each year. We still need to question how much of the observed loading of the atmosphere with greenhouse gases is made by human activities (Earth Guide).

To do this, we must start at the time of James Watt. The overall rise from 280 ppm (the “pre-industrial” value) to the present value of 360 ppm. This means that we are a little more than one third of the way to doubling carbon dioxide on a log scale. By doubling carbon dioxide, there is a rise of 1.5 to 5 degrees Celsius. We have only seen a rise of .5 to 1.7 degrees Celsius which creates a lack-of-equilibrium problem. The change is too fast to allow equilibrium to establish itself. The rise of temperature could be caused by the uptake of heat by the ocean and the brightness of the sun, and effects from volcanic activity (Earth Guide).

One way to obtain a quick estimate answer is by doing some simple calculations, based on the work of Svante Arrhenius, assuming a 2 degree Celsius rise in temperature per doubling of carbon dioxide. The results show that the Sun may play a role in modifying the temperature rise driven by

greenhouse gases. The minor drops in temperature right after 1900 and after 1960 coincide with reduced solar activity. To be sure, while this simple calculation may be enough to explain the observations, it is not a mathematical proof that the warming that has occurred since the days of James Watt is entirely due to human activity. Of course, showing that the observed warming entirely agrees with reasonable expectations for the rise in carbon dioxide does not exclude the possibility that some of this warming would have occurred anyway, without human help. (Earth Guide).

In my personal opinion, I do think that anthropogenic carbon dioxide is a major contributor to the amount of carbon dioxide in the atmosphere. I believe this, because after researching the subject, there was much more information that supported this statement. Clearly there is more evidence that shows that human actions have caused the amount of carbon dioxide in the air to rise thus causing an increase in our Earth's temperature. I think that everyone, especially Americans, need to make a conscience effort to do what they can to reduce the amount of carbon that we release into the atmosphere. Some things that can be done include using less energy around the house, driving fuel efficient vehicles, and conserve energy by reducing yard size and eat locally produced food.

Works Cited

"The Human Contribution." *The Science of Everyday Things*. 2007. Advameg Inc, Web. 4 Oct 2009.

<<http://www.scienceclarified.com/scitech/Global-Warming/The-Human-Contribution.html>>.

"Global Warming." *The Rise of CO₂ and Warming*. 2002. University of California, Web. 4 Oct 2009.

<http://earthguide.ucsd.edu/globalchange/global_warming/03.html>.