



*Photograph by Peter Essick*

## What Causes Global Warming?

Scientists have spent decades figuring out what is causing global warming. They've looked at the natural cycles and events that are known to influence climate. But the amount and pattern of warming that's been measured can't be explained by these factors alone. The only way to explain the pattern is to include the effect of greenhouse gases (GHGs) emitted by humans.

To bring all this information together, the United Nations formed a group of scientists called the [Intergovernmental Panel on Climate Change](#), or IPCC. The IPCC meets every few years to review the latest scientific findings and write a report summarizing all that is known about global warming. Each report represents a consensus, or agreement, among hundreds of leading scientists.

One of the first things scientists learned is that there are several greenhouse gases responsible for warming, and humans emit them in a variety of ways. Most come from the combustion of fossil fuels in cars, factories and electricity production. The gas responsible for the most warming is carbon dioxide, also called CO<sub>2</sub>. Other contributors include methane released from landfills and agriculture (especially from the digestive systems of grazing animals), nitrous oxide from fertilizers, gases used for refrigeration and industrial processes, and the loss of forests that would otherwise store CO<sub>2</sub>.

Different greenhouse gases have very different heat-trapping abilities. Some of them can even trap more heat than CO<sub>2</sub>. A molecule of methane produces more than 20 times the warming of a molecule of CO<sub>2</sub>. Nitrous oxide is 300 times more powerful than CO<sub>2</sub>. Other gases, such as chlorofluorocarbons (which have been banned in much of the world because they also degrade the ozone layer), have heat-trapping potential thousands of times greater than CO<sub>2</sub>. But because their concentrations are much lower than CO<sub>2</sub>, none of these gases adds as much warmth to the atmosphere as CO<sub>2</sub> does.

In order to understand the effects of all the gases together, scientists tend to talk about all greenhouse gases in terms of the equivalent amount of CO<sub>2</sub>. Since 1990, yearly emissions have gone up by about 6 billion metric tons of "carbon dioxide equivalent" worldwide, more than a 20 percent increase.

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Source: Retrieved from <http://environment.nationalgeographic.com/environment/global-warming/gw-causes/> on 17 January 2013