



This is the print version of the [Skeptical Science](http://sks.to/driver) article '[CO2 is not the only driver of climate](http://sks.to/driver)', which can be found at <http://sks.to/driver>.

What The Science Says:

Theory, models and direct measurement confirm CO2 is currently the main driver of climate change.

Climate Myth: CO2 is not the only driver of climate

CO2 is not the only driver of climate. There are a myriad of other radiative forcings that affect the planet's energy imbalance. Volcanoes, solar variations, clouds, methane, aerosols - these all change the way energy enters and/or leaves our climate.

Natural processes have determined Earth's climatic history, but human industrial activities have introduced a new mechanism that is driving Earth's climate future.

At any given time, the Earth's climate is subjected to a myriad of natural influences. The impact of each influence varies based on the magnitude of the natural change, the duration over which the change occurs, and whether or not that change is part of an overall repeated cycle.

Processes that have historically altered the face of the planet, like cycles in the Earth's orbit around the Sun or shifts in continental tectonic plates, occur over tens of thousands to millions of years. While not nearly as dramatic, the influence of solar, ocean, and wind patterns is much more immediate, but these effects generally alternate between warming and cooling over the course of months to decades in relation to their respective cycles. Volcanic eruptions and impacts from celestial bodies, like asteroids, have a near instantaneous effect, but very few of these one-time events are of sufficient size to impact the global climate for more than a few years.

The industrial contribution of CO2 and other greenhouse gases to the atmosphere differs from its natural counterparts in fundamental ways. This human influence is happening very rapidly, is not cyclical, and pushes the climate continually and relentlessly in the single direction of warming.

All of these influences, along with additional factors like land use changes, carbon soot and halocarbon emissions, and albedo variations, must be considered cumulatively to determine the net impact.

Over the last 30 years of direct satellite observation of the Earth's climate, many natural influences including [orbital variations](#), [solar](#) and [volcanic activity](#), and oceanic conditions like [El Nino \(ENSO\)](#) and the [Pacific Decadal Oscillation \(PDO\)](#) have either had no effect or promoted cooling conditions.

Despite these natural oppositions, global temperatures have steadily risen throughout that time.

While natural processes continue to introduce short term variability, the unremitting rise of CO2 from industrial activities has become the dominant factor in determining our planet's climate now and in the years to come.

Basic rebuttal written by Michael Searcy

Update July 2015:

Here is a related lecture-video from [Denial101x - Making Sense of Climate Science Denial](#)



Skeptical Science explains the science of global warming and examines climate misinformation through the lens of peer-reviewed research. The website won the Australian Museum 2011 Eureka Prize for the Advancement of Climate Change Knowledge. Members of the Skeptical Science team have authored peer-reviewed papers, a [college textbook on climate change](#) and the book [Climate Change Denial: Heads in the Sand](#). Skeptical Science content has been used in university courses, textbooks, government reports on climate change, television documentaries and numerous books.



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