



This is the print version of the [Skeptical Science](http://sks.to/co2) article '[Human CO2 is a tiny % of CO2 emissions](http://sks.to/co2)', which can be found at <http://sks.to/co2>.

How do human CO2 emissions compare to natural CO2 emissions?

What The Science Says:

The natural cycle adds and removes CO2 to keep a balance; humans add extra CO2 without removing any.

Climate Myth: Human CO2 is a tiny % of CO2 emissions

"The oceans contain 37,400 billion tons (GT) of suspended carbon, land biomass has 2000-3000 GT. The atmosphere contains 720 billion tons of CO2 and humans contribute only 6 GT additional load on this balance. The oceans, land and atmosphere exchange CO2 continuously so the additional load by humans is incredibly small. A small shift in the balance between oceans and air would cause a CO2 much more severe rise than anything we could produce." ([Jeff Id](#))

Before the industrial revolution, the CO2 content in the air remained quite steady for thousands of years. Natural CO2 is not static, however. It is generated by natural processes, and absorbed by others.

As you can see in Figure 1, natural land and ocean carbon remains roughly in balance and have done so for a long time – and we know this because we can measure historic levels of CO2 in the atmosphere both directly (in ice cores) and indirectly (through proxies).

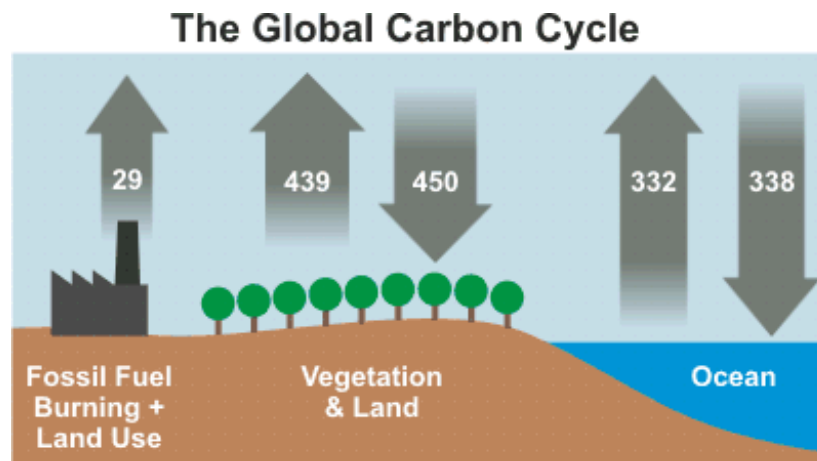


Figure 1: Global carbon cycle. Numbers represent flux of carbon dioxide in gigatons (Source: Figure 7.3, [IPCC AR4](#)).

But consider what happens when *more* CO2 is released from outside of the natural carbon cycle – by burning fossil fuels. Although our output of 29 gigatons of CO2 is tiny compared to the 750 gigatons moving through the carbon cycle each year, it adds up because the land and ocean cannot absorb all of the extra CO2. About 40% of this additional CO2 is absorbed. The rest remains in the atmosphere, and as a consequence, atmospheric CO2 is at its highest level in 15 to 20 million years ([Tripathi 2009](#)). (A natural change of 100ppm normally takes 5,000 to 20,000 years. The recent increase of 100ppm has taken just 120 years).

Human CO2 emissions upset the natural balance of the carbon cycle. Man-made CO2 in the atmosphere has increased by a third since the pre-industrial era, creating an artificial forcing

of global temperatures which is warming the planet. While fossil-fuel derived CO₂ is a very small component of the global carbon cycle, the extra CO₂ is cumulative because the natural carbon exchange cannot absorb all the additional CO₂.

The level of atmospheric CO₂ is building up, the additional CO₂ is being produced by burning fossil fuels, and that build up is accelerating.

Basic rebuttal written by [GPWayne](#)

Update July 2015:

Here is the relevant 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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