Most Important Graph, *Ever*

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Infrared radiation which is reflected[1] from the Earth's surface is of longer wavelength than the incident solar radiation. That means that the carbon dioxide (CO_2) and water (H_2O) constituent gases in the atmoshpere offer an increased propensity to absorb the *reflected* radiant energy than the *incident* radient energy. This absorption asymmetry is known as the *greenhouse effect*. Without this effect, the average temperature at the Earth's surface would be below the freezing point of water.

In addition to CO_2, other constituent greenhouse gases in the atmosphere which are of present concern are methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFC-11 and CFC-12), and the halocarbons.[2] The respective concentrations of these gases in the atmosphere have been increasing markedly since the beginning of the industrial era around 1750 CE, as shown in Figure 1.

The dramatic spike in concentrations are of concern because the respective gases are chemically stable in the atmosphere, and therefore can persist for many decades, sometimes even centuries. This means that increased emissions of these gases arising from human activity can potentially have a very long-term influence on the Earth's climate.

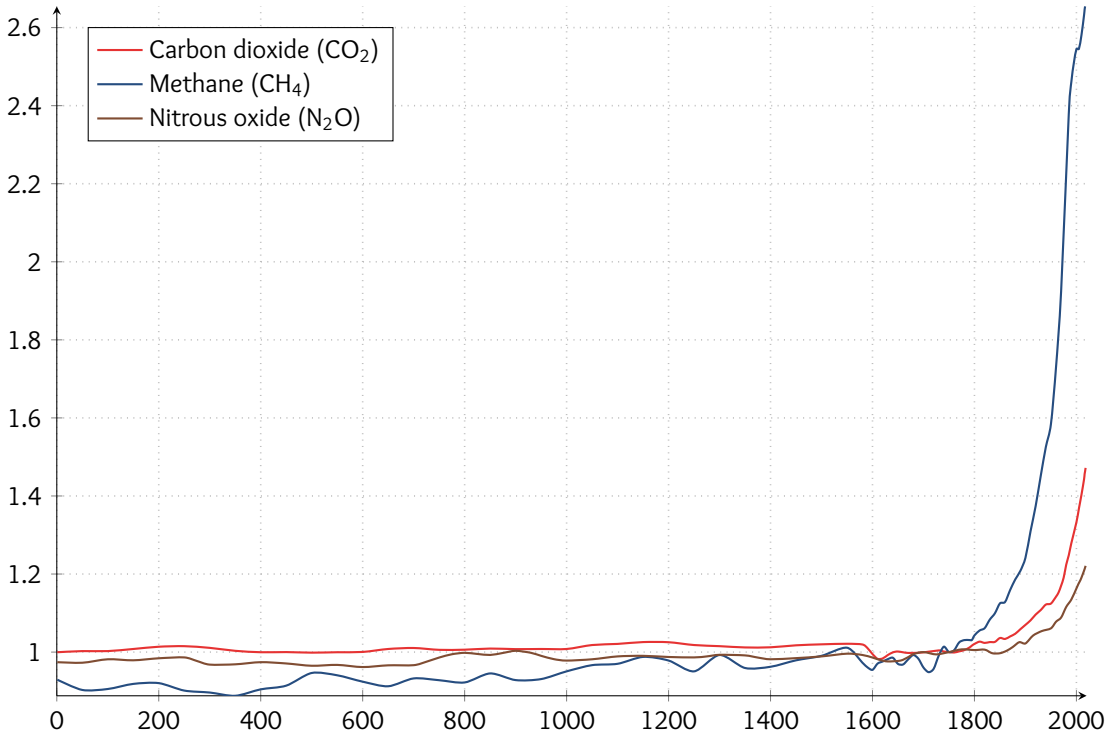

Figure 1: Histories of the globally averaged normalised atmospheric concentrations of the **carbon dioxide (CO_2)**, **methane (CH_4)** and **nitrous oxide (N_2O)** greenhouse gases over the last 2000 years. The industrial era began around 1750. Normalised concentrations are expressed as the relative mole faction, i.e., as the number of molecules of the gas in a well mixed atmospheric sample divided by the corresponding number in 1750. The plot combines data from measurements of gas concentrations trapped in ice cores at Law Dome, Antarctica, and of directly measured marine surface annual mean data.

In the figure, data for the ice cores at Law Dome were accessed from the US's National Oceanic and Atmospheric Administration (NOAA).[3] Marine surface annual mean data were also accessed from the NOAA.[4] [5] [6]

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[1] I declare this to be my own work, entirely. In particular, no AI was used in any research, analysis, synthesis, writing, nor typesetting of this work. In short, AI was not recruited at any time in this work. Errors and inaccuracies are therefore proudly my own.

[2] The halocarbons are a group of gases containing flourine, clorine and bromine.

[3] Source: "Law Dome ice core 2000 year CO_2, CH_4, and N_2O data," Earth System Research Laboratory, Global Monitoring Division, National Oceanic and Atmospheric Administration. Retrieved from `ftp://ftp.ncdc.noaa.gov/pub/data/paleo/icecore/antarctica/law/law2006.txt`. Accessed 19Mar19.

[4] Source: "Trends in Atmospheric Carbon Dioxide," Ed Dlugokencky and Pieter Tans, Earth System Research Laboratory, Global Monitoring Division, National Oceanic and Atmospheric Administration. Retrieved from `https://www.esrl.noaa.gov/gmd/ccgg/trends/gl_full.html` and `ftp://aftp.cmdl.noaa.gov/products/trends/co2/co2_annmean_gl.txt`. Accessed 10Mar19.

[5] Source: "Trends in Atmospheric Methane," Ed Dlugokencky and Pieter Tans, Earth System Research Laboratory, Global Monitoring Division, National Oceanic and Atmospheric Administration. Retrieved from `https://www.esrl.noaa.gov/gmd/ccgg/trends_ch4/` and `ftp://aftp.cmdl.noaa.gov/products/trends/ch4/ch4_annmean_gl.txt`. Accessed 10Mar19.

[6] Source: "Combined Nitrous Oxide data," Ed Dlugokencky, Earth System Research Laboratory, Global Monitoring Division, National Oceanic and Atmospheric Administration. Retrieved from `https://www.n2olevels.org/` and `ftp://ftp.cmdl.noaa.gov/hats/n2o/combined/HATS_global_N2O.txt`. Accessed 10Mar19.