**THE NOAA ANNUAL GREENHOUSE GAS INDEX (AGGI) 2017**

NOAA Earth System Research Laboratory

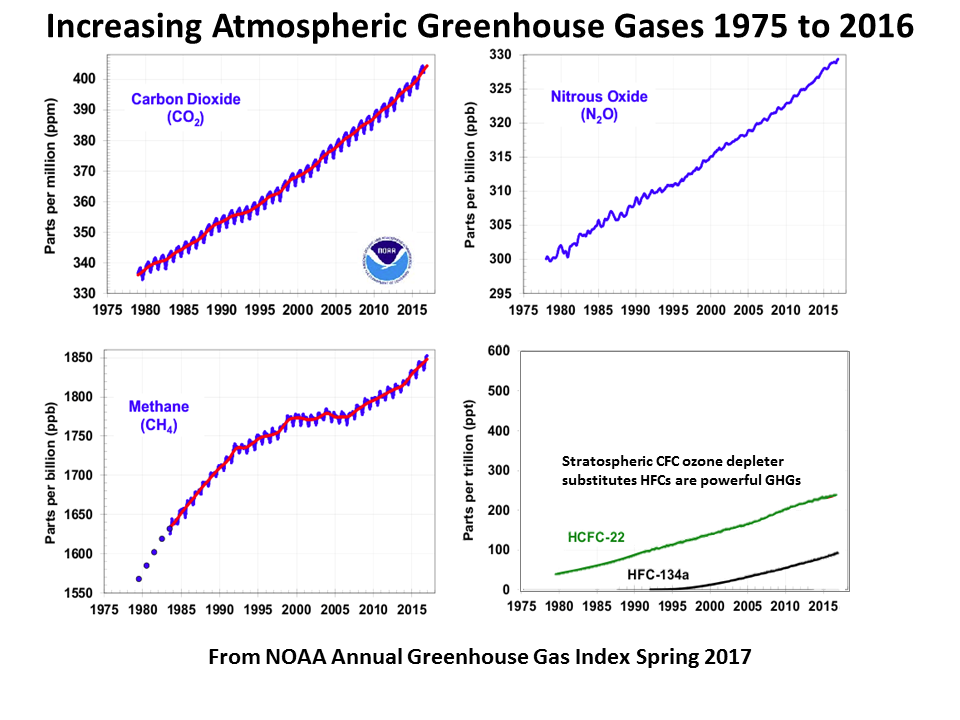
Updated Spring 2017

**Carbon dioxide CO2** The atmospheric abundance of CO2 has increased by an average of 1.80 ppm per year over the past 38 years (1979-2016). **The CO2 increase is accelerating**: it averaged about 1.5 ppm per year in the 1980s and 1990s, and it was 2.2 ppm per year during the last decade (2007-2016). The annual CO2 increase from 1 Jan 2016 to 1 Jan 2017 was 2.9 ± 0.1 ppm (see https://www.esrl.noaa.gov/gmd/ccgg/trends/global.html), which is the second largest increase observed in the measurement record since 1980; the largest increase was measured during 2015.

**Methane CH4** Since 2007 (following flat from 2000), **globally averaged methane CH4 has been increasing again**. Causes for the increase during 2007-2008 included warm temperatures in the Arctic in 2007 and increased precipitation in the tropics in 2007 and 2008 and isotopic measurements argue for continued increasing microbial emissions after 2008 [Comment i.e. amplifying global warming **feedback**] (e.g., from wetlands or agriculture). Recent papers have also suggested contributions to the plateau and subsequent increase in methane’s global abundance from changes in the loss rate of methane. **Since 2013, the global within-year increase (1 Jan to 1 Jan) in methane has become even larger**, with increases between 8.7 and 12.6 ppb/yr through 2016 compared to an average annual increase of 5.7 ± 1.2 ppb yr-1 between 2007 and 2013.

**Nitrous oxide N2O** The atmospheric burden of nitrous oxide continues to **slowly increase over time**, with an average rate of 0.9 ppb yr-1 over the past decade.

Due to the increasing atmospheric GHG concentrations, for 2016 the total direct radiative (heat) forcing had increased of 40% since 1990.



<https://www.esrl.noaa.gov/gmd/aggi/aggi.html>

Comment**: obvious atmospheric GHG planetary emergency**

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