

## 5.134 The policy relevance of atmospheric greenhouse gas concentration trends to 2016.

Presenting Author:

**Peter Carter**, Climate Emergency Institute, [petercarter46@shaw.ca](mailto:petercarter46@shaw.ca)

Abstract:

The policy relevance of atmospheric greenhouse gas concentration trends to early 2016  
This paper addresses the practical policy-relevant science of atmospheric greenhouse gas (GHG) concentrations and trends to early 2016. The author records these monthly from the NOAA ESRL. Under the 1992 UN Framework Convention on Climate Change, the concentration of atmospheric GHGs defines the safety limit for avoiding dangerous anthropogenic interference (DAI) with the climate system, but concentrations do not appear in UN negotiations. This limit has climate science and policy advantages over the global average temperature increase alone, as it allows us to account for climate change commitment and ocean acidification. The present concentration of atmospheric GHGs is a commitment of 1.5°C to "about 2.0°C" of warming (IPCC AR5, 2014). The IPCC AR5 says that all long-lived GHG emissions must drop to "almost zero" for global temperature stabilization. The same applies to CO<sub>2</sub> for ocean acidification. CO<sub>2</sub>, methane and nitrous oxide levels are substantially higher than their 800,000 year maximum and all are increasing rapidly. The "dramatic and unprecedented" rate of CO<sub>2</sub> increase (IPCC AR4, 2007) is still accelerating. Its annual increase of 3.05 ppm for 2015 was the highest ever recorded and the fourth consecutive year over 2 ppm. This is even though fossil fuel CO<sub>2</sub> emissions did not increase for 2014 and 2015. Carbon feedback effects between atmospheric CO<sub>2</sub> and surface temperature, and weakening of terrestrial and ocean carbon sinks, are considered for policy relevance. The global surface temperature increase is now above 1.0°C, with 2015 the highest annual increase recorded. The risk of "runaway carbon dynamics" (IPCC TAR, 2001) is considered. We conclude that atmospheric GHG concentrations are beyond DAI, which requires implementation of the most stringent range of the best-case IPCC AR5 (2014) scenario, RCP2.6.