



## IEAGHG Information Paper 2016-IP42: Latest Information on Global Methane Emissions

The Clean Air and Climate Coalition in its 2015 Science<sup>1</sup> update indicated that global methane emissions plateaued in 1999 then started to increase again in 2007; the cause of this increase has since been the subject of much scientific debate. In an earlier article<sup>2</sup>, IEAGHG presented conflicting published scientific studies that suggested the source of the increase was either biogenic in nature i.e. from rice production, wetlands and agriculture or as a result of oil and gas production and, in particular, the increase in fracking in North America.

In the most recent study, published in the journal Nature<sup>3</sup>, scientists have analysed the isotopic profiles of methane emissions and used the most extensive dataset (supposedly 100 times bigger than previous ones) than those used in other studies on this topic to date to try and answer the question as to what is causing the increase in methane emissions. They also found a new way to distinguish between different methane sources. Methane molecules have slightly different carbon profiles, called isotopes, depending on whether they come from fossil fuels or from microbes at work, whether in wetlands or the digestive tracts of livestock. The researchers used the different isotopic signatures to identify which sources of methane were causing the increase in global methane emissions.

The study has shown that overall emissions from industry and natural geological sources combined are 60 - 110 % greater than current estimates. Such a finding of course has serious implications for global efforts to cap global warming at “well under” 2°C as per the Paris Agreement. One impact of the new study is that the emissions scenarios currently used for climate prediction needs to be reassessed taking into account revised values for anthropogenic methane emissions. This will need to be done in time to be included in the new IPCC Report on below 2°C, due to be published in 2018.

With regard to the oil and gas sector, one of the key conclusions from the study is that methane emissions from the oil and gas sector in emission inventories have been underestimated by 20-60%. It is noted that in the US the Environmental Protection Agency (EPA) has been updating and increasing its national inventory analyses on methane emissions and in particular those from the oil and gas sector using data from studies such as the work presented here in recent years<sup>4</sup>.

However, methane emissions, they say, despite the increased activity in oil and gas production in North America are not the source of the global increase in methane emissions. In fact the industry has reduced its emission intensity most probably as a result of increased regulatory measures like the Trilateral Agreement recently signed between the USA, Canada and Mexico which in part looks to reduce methane emissions in the oil and gas sector further by increased regulation<sup>5</sup>. The scientists make the point that oil and gas sector emissions can be further controlled by increased regulation and voluntary industry action.

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<sup>1</sup> IEAGHG Information Paper 2016/10: CCAC Annual Science Uptake 2015 see

[www.ieaghg.org/docs/General\\_Docs/Publications/Information\\_Papers/2016-IP10.pdf](http://www.ieaghg.org/docs/General_Docs/Publications/Information_Papers/2016-IP10.pdf)

<sup>2</sup> IEAGHG Information Paper: 2016-IP6; A new debate on Increases in Methane Emissions and Terrestrial Carbon Uptake, see [www.ieaghg.org/docs/General\\_Docs/Publications/Information\\_Papers/2016-IP6.pdf](http://www.ieaghg.org/docs/General_Docs/Publications/Information_Papers/2016-IP6.pdf)

<sup>3</sup> <http://www.nature.com/nature/journal/v538/n7623/full/nature19797.html>

<sup>4</sup> <https://www.epa.gov/ghgemissions/natural-gas-and-petroleum-systems>

<sup>5</sup> IEAGHG Information Paper: 2016-IP23; New Trilateral Agreement on GHG Mitigation, see [http://www.ieaghg.org/docs/General\\_Docs/Reports/2016-IP23.pdf](http://www.ieaghg.org/docs/General_Docs/Reports/2016-IP23.pdf)



The actual cause, the scientists indicate, can be attributed to increased biological methane production from human based activities from cattle, landfills and rice paddies. Reducing emissions from the agricultural sector through measures such changes in agriculture practise and reduction in meat consumption could also help reduce methane output, but are acknowledged to be harder to bring about.

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