

Interactive comment on “The Global Methane Budget: 2000–2012” by Marielle Saunois et al.

Anonymous Referee #2

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This is a very interesting paper that brings together what is known about the global and regional methane budgets and highlights the sources of uncertainty. I am sure this paper and its updates will be an import reference in the future.

The summaries of the existing estimates of anthropogenic emissions: fossil fuels, waste, agriculture etc. was very interesting but it could be noted that underlying all these different approaches is the IPCC guidelines (IPCC 2006) (except Shale Gas which was not significant when the IPCC guidelines were written) so, despite their different assumptions and data used they are not completely independent.

The over-estimate of coal methane from China in the EDGAR estimates highlights why the IPCC guidelines recommend national factors for significant contributors to total emissions, simply applying "Tier 1" factors without checking their appropriateness can lead to significant errors.

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The paper notes that overall the T-D estimates are greater than the B-U estimates BUT this is mainly due to inland water, wetlands and geological leaks. For those sources that counties report nationally to the UNFCCC (with a probable increase in reporting under the Paris Agreement) it would be useful to stress the good agreement between B-U and T-D estimates thus providing additional credibility to these reports in the policy arena.

The paper gives values as mean and +/- 25% ranges of the estimates presented in the different sources. Some discussion of the uncertainties in the individual estimates (especially as they are not completely independent) would be helpful to inform the reader about the overall accuracy of these budgets.

The paper states that emissions are characterized according to their anthropogenic or natural origin. This should be qualified that these are not the definitions of anthropogenic and natural used by the UNFCCC or in the IPCC Guidelines where, for pragmatic reasons, all emissions from managed land are reported as anthropogenic.

Minor points.

In the discussion about coal mine methane it should be added that (page 12 lines 15-17) that the geological history (basin uplift) is also an important determinant of the coal emission factor.

page 43 line 16 " central North America" - should this be "boreal North America"?

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