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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Global anthropogenic methane emissions 2005–2030: technical mitigation potentials and costs" *by* L. Höglund-Isaksson

Anonymous Referee #1

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I'd like to congratulate the authors with an excellent piece of work. This manuscript provides very useful quantitative information about the large mitigation potential of methane, which has already been pointed out before by several authors. To my knowledge, however, the quantitative side of the story – in particular concerning the costs involved - has not been analyzed to such a level of detail before. I have only a few comments that in my opinion should be addressed to make the manuscript understandable to a wider audience and would put the results in a wider perspective.

MAJOR COMMENTS

The costs in Figure 6-10 are expressed in euro, but it is unclear to me how they relate

to the equations in section 2.2.2. For example, what is meant exactly by the 'unit cost of technology' in equation 3? I had expected C to be expressed in euro per avoided amount of CH4 or something like that. The term 'unit costs' suggests that it is some kind of normalized quantity and may apply to any currency. In that case, however, I don't understand equation 4, which clearly depends on the unit of "p". This should be clarified.

It is unclear how this work relates to what has been done before. The baseline emissions for 2005 are compared with other estimates. There is some discussion about the baseline of 2030. However, the text only mentions USEPA. More information is actually provided in the tables. It is unclear why those estimates are not discussed in the text. Besides the baseline there must be other CH4 mitigation scenarios to compare with, like those presented in some of the IPCC reports. In my opinion an extended comparison of the reported mitigation potential to other estimates is needed to put this work in the right perspective.

It is unclear why the uncertainty analysis only addresses the uncertainty of the baseline 2030 emissions and not the uncertainty of the mitigation scenarios both in terms of avoided CH4 emissions and costs.

TECHNICAL COMMENTS

Page 11276, line 16: A CH4 lifetime of 12 year seems rather long. It is true to there is some uncertainty in the estimates, but 10 year seems more appropriate (otherwise a reference is certainly needed here).

Page 11281, Eq. 3: What is Iim?

Page 11283, Line 2: How realistic is this assumption? I have a hard time believing that investment decisions are made without consideration of the future fuel price development. To what extent does this assumption influence the difference between the private and social cost scenarios?

Page 11289, Line 7: What is the problem to weighing the relative importance of different sectors to obtain global uncertainty estimates? Since you have an estimate of the emission per sector, wouldn't it be easy to weigh the uncertainty by that emission? This should be clarified.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 11275, 2012.