

Interactive comment on “Comment on “Carbon farming in hot, dry coastal areas: an option for climate change mitigation” by Becker et al. (2013)” by M. Heimann

Anonymous Referee #1

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The comment by Martin Heimann is clearly written. The main conclusion is that the stabilisation of the atmospheric CO₂ concentration requires a much larger additional sink or corresponding reduction of anthropogenic emissions than suggested by Becker et al. This conclusion is quantitatively well supported by his model results as well as by a very large number of papers addressing the fate of anthropogenic carbon in the Earth system.

The statement by Becker et al, that a removal of 4.3 GtC per year (by cultivation of 0.73×10^9 ha with *Jatropha*) would reduce atmospheric CO₂ by an equal amount is wrong and in conflict with the fact that CO₂ is exchanged among the ocean, land, and atmosphere.

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The comment by M. Heimann is timely and puts the results of Becker et al. into perspective. It is unfortunate that this particular mistake in the paper by Becker et al. was not discovered during the review process.

I support the publication of the comment by Martin Heimann.

Minor comments: There are now various versions of "Bern" models in the literature and it would be nice to clarify which version was used. In Forster et al., 2007, p 213, the Bern2.5CC model, including a 2.5D dynamical ocean and the LPJ-Dynamic Global Vegetation Model, was used to compute GWPs. In the IPCC Second Assessment the "Bern" model included a representation of the HILDA box-diffusion type ocean model and a simple 4-box land biosphere. These different models yield very similar results in terms of atmospheric CO₂.

Interactive comment on Earth Syst. Dynam. Discuss., 4, 869, 2013.