Interactive comment on "Global consequences of afforestation and bioenergy cultivation on ecosystem service indicators" *by* Andreas Krause et al.

Anonymous Referee #2

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The manuscript quantifies potential carbon mitigation using land cover and land use change scenarios related to a BECCS, an afforestation, and combined scenario using the LPJ-GUESS dynamic global vegetation model. In addition to quantifying carbon mitigation, they also quantify changes in a variety of ecosystem services that LPJ-GUESS variables can roughly be related to, including albedo, N losses, biodiversity, run off, etc. Given the importance of carbon management in mitigating climate change, this manuscript is very useful to have in the literature to provide a context for evaluating trade-offs.

My main comments are: 1. The work is all modeling based and so the performance

of the model under present day conditions and the uncertainties moving into the future are quite important but are neglected. It would be helpful to investigate these uncertainties more formally, or to add a section in the Discussion on 'Uncertainties', what the authors consider to be of highest importance and what should be done to reduce the uncertainties.

2. I agree with the second reviewer that it is somewhat confusing to have the IMAGE and MAGPIE models run with LPJml, and then for this publication to use LPJ-GUESS. I understand that the IAM models needed a terrestrial biosphere model to generate the land-use change scenarios, but its not clear whether you want to compare with the LPJml results, or whether to simply use the land cover/land use change scenarios as driver data for LPJ-GUESS.

3. The implementation of land cover and land use change in LPJ-GUESS is a bit vague. Please specify i) if gross or net land cover change transitions are used, ii) if wood harvest is considered, and iii) whether product pools are included.