Interactive comment on “Meeting climate targets by direct CO$_2$ injections: What price would the ocean have to pay?” by Fabian Reith et al.

Anonymous Referee #2

Received and published: 4 April 2019

CO2 emissions are increasing at an unprecedented rate into the earth’s atmosphere. By and large, global political leadership have recognized the consequences of such emissions for human kind and ecosystems. As a result, the 2015 Paris Agreement has set the target of limiting global warming to below 2°C. To achieve such a target, academicians have been discussing some unconventional methods – known as geo-engineering. To the same effect, in this study, Reith and co-workers have presented this excellent and very thorough analysis of consequences of injecting atmospheric CO2 into the deep oceans. Their analysis looks robust (I am not a modeller though!).

I have just a couple of comments that might be discussed in the revised version of the manuscript:

1. I am not sure if the trade-off between the amount of CO2 released back to the at-
mosphere in collecting CO2 from the atmosphere and injecting it into the deep CO2 has been considered. By which way(s) the atmospheric CO2 can be collected from the atmosphere and put into the deep ocean, and how much CO2 will be emitted back (through the instruments used for such huge task) to achieve both the actions. I know this might not be feasible to incorporate in the model but it needs to be discussed/mentioned.

2. Can (gas chromatographically) CO2 alone be collected from the atmosphere on such a large scale? Or will CO2 be part of the mixture of all the atmospheric gases and particles (aerosols)? Was the model tuned for injecting of natural air rather than only CO2 into the deep ocean? How sensitive mixture would become for ocean chemistry?