

# ***Interactive comment on “Ideas and perspectives: Synergies from co-deployment of negative emission technologies” by Thorben Amann and Jens Hartmann***

## **Anonymous Referee #1**

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General comments: The work of Amann and Hartmann reviews the use of carbon negative technologies, particularly Enhanced Weathering (EW). The main view point expressed by the authors is the necessity for a “co-deployment” of several technologies, because no single approach will be able to reach the 1.5C target set by the IPCC. The manuscript is timely, and I support the overall goal. However, the manuscript is largely qualitative rather than quantitative, and seems to focus on soil and EW, whereas the title, and partially the abstract, implied a much broader review. In my opinion this work can be published in BG, but some amendments are necessary.

Specific comments: - Figure 1 is not sufficiently clear. I would place the benefactor on

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top of the beneficiaries. Also I was not sure how to read the figure. For example, in the first block EW enhances the nutrient pool and maintain afforestation? I was not sure about the meaning of benefactor and beneficiary here;

- P.2, line 11. I would appreciate if the authors would insert also a comment on the social and environmental effect of mining;

- P.3, line 13 introduces the content of enhanced weathering but not all readers are familiar with what this is;

- P.3, line 26 mention for the first time dunite and basalt. Can the author specify why they choose these specific examples? References are reported but the reader is left wondering what's special about these rocks;

- Figures 2-3 are interesting, but I am wondering about the overall availability of these resources. As an example, I am not sure about the relevance of komatiite. I understand this is an explicative diagram, but the context here is that of global-deployable technologies. I feel the text should explain better the abundance and distribution of some key resources, or at least provide relevant references/tabula data;

- P.5., line 20 would benefit of a reference. Current models do not consider nutrient availability?;

- The paragraph on soil hydrology does not specify the size of the grains that would decrease soil conductivity. I understand this would depend on the soil but can at least a range be specified? It would be important to specify size ranges for these rock flours;

- The paragraph on soil biota is extremely qualitative. At least one could point out which minerals are more susceptible to bioweathering, or which structural elements are more needed by soil bacteria. It would also be important to point out the interaction between type of crops and bacteria. In fact I was surprised not to see a paragraph dedicated on how different crops may work synergistically with different type of rocks. The entire manuscript seem to focus on afforestation, but it would be interesting to point out how

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agriculture may also benefit from EW;

- A general comment on nitrogen would benefit the manuscript (e.g., Nitrogen in rock: Occurrences and biogeochemical implications 2002 JoAnn and M. Holloway).

Technical comments: - Figure 1 caption can be improved. Land-based should be spelled with a dash and capital letters should be double-checked;

- I may have missed it but I do not think EW was ever defined;

- I would switch the phrasing of the title to: “Synergies from co-deployment of negative emission technologies: Ideas and perspectives”;

- Latinism such as e.g. and i.e. should be italicized;

- I would change the heading of the last paragraph from “synthesis” to “summary” or “conclusion”;

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