

Distributed direct air capture of carbon dioxide by synergistic water harvesting

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This manuscript has been previously reviewed at another journal. This document only contains reviewer comments and rebuttals for versions considered at Nature Communications.

This file contains all reviewer reports in order by version, followed by all author rebuttals in order by version.

Version 0:

Reviewer comments:

Reviewer #1

(Remarks to the Author)

I can agree with the rebuttal of the authors with respect to my remarks on the previous version of the manuscript.

Reviewer #2

(Remarks to the Author)

This is a much improved manuscript compared to the previous version. The authors have thoroughly addressed all of my comments and concerns. In particular, they made it clear how their synergistic CO₂ and water capture from the atmosphere, and using in situ the steam produced from the adsorbed water to release the CO₂, is different from other DAC processes involving direct steam regeneration or combined CO₂+water adsorption. Furthermore, the addition of the regeneration energy analysis, and its breakdown into various components, such as sensible or latent heat for different components involved, and the comparison with state-of-the-art DAC technologies significantly strengthened the manuscript. As far as I'm concerned, this manuscript can be published in Nature Communications with no further changes.

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Response to Reviewers:

Reviewer #1

I can agree with the rebuttal of the authors with respect to my remarks on the previous version of the manuscript.

RE: We are grateful to the reviewer for acknowledging our responses.

Reviewer #2

This is a much improved manuscript compared to the previous version. The authors have thoroughly addressed all of my comments and concerns. In particular, they made it clear how their synergistic CO₂ and water capture from the atmosphere, and using in situ the steam produced from the adsorbed water to release the CO₂, is different from other DAC processes involving direct steam regeneration or combined CO₂+water adsorption. Furthermore, the addition of the regeneration energy analysis, and its breakdown into various components, such as sensible or latent heat for different components involved, and the comparison with state-of-the-art DAC technologies significantly strengthened the manuscript. As far as I'm concerned, this manuscript can be published in Nature Communications with no further changes.

RE: We are grateful to the reviewer for the positive comments.