REPORT

# Climate model shows large-scale wind and solar farms in the Sahara increase rain and vegetation

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## More energy, more rain

Energy generation by wind and solar farms could reduce carbon emissions and thus miti[...] anthropogenic climate change. But is this its only benefit? Li *et al.* conducted experimen[...]s-ing a climate model to show that the installation of large-scale wind and solar power gen[...]tion facilities in the Sahara could cause more local rainfall, particularly in the neighboring Sa[...]re-gion. This effect, caused by a combination of increased surface drag and reduced albedo, [...]ld increase coverage by vegetation, creating a positive feedback that would further increase [...]n-fall.

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## Abstract

Wind and solar farms offer a major pathway to clean, renewable energies. However, these farms would significantly change land surface properties, and, if sufficiently large, the farms may lead to unintended climate consequences. In this study, we used a climate model with dynamic vegetation to show that large-scale installations of wind and solar farms covering the Sahara lead to a local temperature increase and more than a twofold precipitation increase, especially in the Sahel, through increased surface friction and reduced albedo. The resulting increase in vegetation further enhances precipitation, creating a positive albedo–precipitation–vegetation feedback that contributes ~80% of the precipitation increase for wind farms. This local enhancement is scale dependent and is particular to the Sahara, with small impacts in other deserts.

## Supplementary Material

### Summary

Materials and Methods

Supplementary Text

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References (*38*–*55*)

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