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Reply on CC2

Xueyuan Gao et al.

Author comment on "Exploration of a novel geoengineering solution: lighting up tropical forests at night" by Xueyuan Gao et al., Earth Syst. Dynam. Discuss.,
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Large clean energy requirements have always been a hurdle to large-scale deployment of any CDR (Carbon Dioxide Removal) techniques, including DACC and the strategy we discuss in this study. In terms of technical analysis, we can get more clean energy by deploying more low-carbon energy generation plants across the globe (e.g., building large-scale solar and wind farms in the Sahara Desert (Li, et al. 2018)). In terms of economic analysis, however, both DACC and this strategy are energetically and financially costly, and therefore, are unrealistic at present (Chatterjee, et al. 2020). Moreover, even if the clean energy generation capacity increases, we cannot expect the global clean energy supply to only be invested to absorb CO₂. Nevertheless, if society has urgency to intervene in the Earth's climate by removing CO₂ from the atmosphere in the late half of the 21st century, and/or an energy revolution realizes and we achieve the status of a significant surplus of clean energy, CDR would still be a powerful and effective climate mitigation strategy.