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Sent: Monday, 22 May, 2023 17:25
To: Supervisory-Body <Supervisory-Body@unfccc.int>
Subject: SB005 Input

Dear Supervisory Body,

I'm writing as a Professor of marine carbon science based at the University of Exeter in the UK, who has worked extensively on carbon cycle questions, including CDR.

I wish to input to the '[SB005 annotated agenda and related annexes](#)', with particular reference to the conclusions around engineered v. land-based removal. In particular tables 3 and 4 present what I perceive to be a concerning one-sided view on the opportunities/challenges of engineered and land-based removal.

Specific concerns:

- Engineering-based activities "are technological... unproven". Please see <https://climeworks.com/roadmap/orca> - this amongst other technologies is now working commercially. It is at an early stage and at small scales, but there is no reason for some of these technologies not to continue to rapidly scale.
- Engineering-based activities "... are not suitable for implementing in developing countries. This is an odd statement – implementation of these technologies will be where there is renewable energy generation potential and geological storage potential. Solar potential is largest in developing countries and storage in depleted oil and gas reservoirs and/or flood basalts has huge potential across the developing world and developed world.
- Engineering-based activities "do not contribute to reducing global mitigation costs, and therefore do not serve any of the objectives of the Article 6.4 mechanism...". While these are expensive approaches at present, they are still necessary in addition to land-based approaches and cheaper than living with the impacts they avoid.
- Land-based activities lists a single con. Obvious cons that need to be added are:
 - o Competition for land-use with food security
 - o Unclear if the scale can be increased substantially – The approach taken in the SB005, adding up the middle value of the range projected by each of the land-based approaches take you about to the right number, is far too simplistic. There are much more careful assessments of what is achievable – amongst others, please see <https://www.stateofcdr.org/resources>.
 - o Biodiversity/ecosystem-service trade-offs associated with intensive monoculture for things like biochar
 - o Plenty of scope for unintended consequences of land-based approaches at large scales, for example, changed water availability.
 - o Significant challenges to verification of removal, and therefore risk of money being spent on ineffective approaches
 - o Time lag between planting and build-up of carbon stocks
 - o True cost of long-term (multi-centennial) maintenance, verification, and factoring in unavoidable loss (e.g. wildfires, disease, drought...) typically ignored.
 - o The Land Gap Report from your own website does a good job of highlighting some of the challenges around land-based removal:
https://unfccc.int/sites/default/files/GST/2023-05/The-Land-Gap_GST%20TD1.3%20submission.pdf

In summary, unfortunately we need all of these approaches in parallel - extremely rapid decarbonisation, land-based *and* engineered removal. It is extremely important that SB005 does not prematurely start taking options off the table.

Kind regards,
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