Supervisory Body (Supervisory-Body@unfccc.int)
United Nations Framework Convention on Climate Change (UNFCCC)
RE: Input to SB005 Annotated Agenda and Related Annexes

Dear Supervisory Body,

We appreciate the opportunity to respond to the Information Note entitled "Removal activities under the Article 6.4 mechanism" (A6.4-SB005-AA-A09 version 0.40) and specifically the comments included that "engineering-based removal activities are technologically and economically unproven, especially at scale, and pose unknown environmental and social risks" and that "these activities do not contribute to sustainable development, are not suitable for implementation in the developing countries and do not contribute to reducing the global mitigation costs, and therefore do not serve any of the objectives of the Article 6.4 mechanism."[1]

We view this broad-brush elimination of a diverse set of potential climate solutions to be misguided. First, there is extensive analysis suggesting that carbon dioxide removal (CDR) will be critical to achieve net-zero emissions economy by 2050 and with innovation and investment, emerging technologies have the potential to remove billions of tons of carbon dioxide (CO2) from the atmosphere each year. According to the IPCC, **all emissions pathways that limit planetary warming to 1.5°C by the end of the century without overshoot, and 87% of pathways that limit warming to 2°C, rely on large-scale atmospheric CDR**.[2] And the National Academy of Sciences finds that, even with aggressive emissions cuts, the world will need to remove 10 billion tons of CO2 per year by midcentury to meet Paris targets.[3] While CDR includes nature-based strategies, most models also lean on technological solutions, including direct air capture with carbon storage (DACCS). Analyses by Rhodium Group and Realmonte, et al. suggest that excluding technological CDR would make it nearly impossible to achieve our emissions targets in the time frame needed.[4,5] Furthermore, while nature-based strategies can contribute to sustainable development, if not implemented with appropriate safeguards they can increase competition for land and threaten sustainable development including food security. Relying solely on this approach only increases the scale needed for its implementation, especially when considering risks of disturbances and uptake variability which imply a need for more removal than strictly necessary as insurance against those losses.[6] This further increases the accompanying risks to sustainable development.

Second, an emerging technology's potential cannot be fully judged by its weakness in early stages of innovation and demonstration. History presents plenty of examples: arguments of poor economic viability and unknown social and environmental risks have been made against solar energy, offshore

[1] The Information Note identifies direct air carbon capture and storage (DACCS), enhanced rock weathering, ocean alkalinization, and ocean fertilization as engineering-based removal activities.
[2] IPCC. (2018). Special Report: Global Warming of 1.5°C. https://www.ipcc.ch/sr15/chapter/chapter-2/
[3] National Academy of Sciences. (2019). Negative Emissions Technologies and Reliable Sequestration. bit.ly/2kGjSwy
[4] Larsen, J., Herndon, W., Grant, M., & Marsters, P. (2019, May 9). Capturing Leadership: Policies for the US to Advance Direct Air Capture Technology. Rhodium Group. bit.ly/2KkNwC7
[5] Realmonte, G., Drouet, L., Gambhir, A., Glynn, J., Hawkes, A., Koberle, A.C., & Tavoni, M. (2019, July 22). An inter-model assessment of the role of direct air capture in deep mitigation pathways. Nature Communications. go.nature.com/2kHwcfQ
[6] Anderegg, W.R., 2021. Gambling with the climate: how risky of a bet are natural climate solutions?. *AGU Advances*, *2*(3)

wind power, and electric vehicles. In recent years, CDR technology has moved from theoretical concept to pilot scale, producing a handful of potentially scalable approaches for generating negative emissions by capturing CO2 from the atmosphere. According to the IEA, there are currently 18 direct air capture plants operating worldwide. There are several more in advanced development and construction, including larger-scale projects like the 1MtCO2/year plant in the United States being developed by 1PointFive and Carbon Engineering and a 36,000 tCO2/year plant in Iceland by Climeworks[7], as well as planned projects in developing countries.[8]

Emerging technologies, from hydrogen to alternative aviation fuels to CDR, are always accompanied by risk and uncertainty, and EDF is emphatic in our support for clear-eyed and scientifically rigorous assessment of those risks and development of the necessary guardrails. It is not the practice or the role of the UNFCCC or its bodies to make judgements against specific technologies. By the logic of the Supervisory body's argument, other emerging technologies could be written off as well, which would be potentially counterproductive. We urge against setting such a precedent.

We also welcome the debate about how to best prioritize investment in different climate strategies. But rather than disregard a full class of technological solutions and pick winners and losers, the UNFCCC's effort would be better directed toward creating transparent definitions grounded in science, establishing a fair competition, and setting a high bar for success by developing a greater understanding of the data requirements, scientific analysis, and procedures necessary for rigorous guardrails governance and integrity and risk mitigation strategies for technological CDR as well as other emerging technologies such as hydrogen.

"Engineering-based" CDR approaches, such as DACCS, have an opportunity to help meet the Paris Agreement targets and should be considered for eligibility under the Article 6.4 mechanism. There are challenges and risks to both "engineering-based" and "land-based" carbon removal approaches, but both are likely necessary to reach the scale of CDR required. Therefore, those removal activities that are backed by robust science, have low environmental and social consequences, and are durable, measurable, and verifiable are worth considering for eligibility under the Article 6.4 mechanism.

A minor, but important note: the definitions in the CDR space are often used inconsistently. Distinguishing between "engineering-based" and "land-based" carbon removal strategies is unclear and unnecessary, as an emerging set of solutions straddle both categories. We recommend the UNFCCC leverage its global leadership to bring greater clarity to this space by adopting a more specific definition of CDR that is consistent with existing norms and true to the fundamental goals of the process (for example, as used in IPCC AR6 WGIII Report Glossary p 1,796).

Sincerely,

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[7] IEA (2022), Direct Air Capture, IEA, Paris https://www.iea.org/reports/direct-air-capture, License: CC BY 4.0
[8] e.g. https://www.fastcompany.com/90829221/this-startup-captures-co2-by-injecting-it-straight-into-volcanic-rock; https://www.zawya.com/en/projects/industry/saudi-arabias-first-direct-air-capture-plant-is-in-design-stage-op58eifg