May 25, 2023

Supervisory Body, Article 6.4 Mechanism

RE: *Input to SB005 annotated agenda and related annexes*

Dear Chair Olga Gassan-zade and Vice-Chair El Hadji Mbaye Diagne:

We would like to thank you for the opportunity to comment on the Supervisory Body's open call for stakeholder input on issues included in the agenda and annexes of the 5th meeting including the Information Note on carbon removal under the Article 6.4 mechanism.

The National Wildlife Federation (NWF) is a leading conservation advocacy and education organization. We work to support approaches to address the climate crisis that also address the intertwined global biodiversity crisis and support human well-being.[1] We believe that developing a high-integrity framework for removals under Article 6.4 will be essential to ensure that we can achieve the goals of the Paris Agreement, and we thank the Supervisory Body for its efforts.

Our comments encompass the three main categories of carbon dioxide removal (CDR) activities as we see them (land-based, ocean-based, and engineering-based). Our comments also emphasize the need to prioritize Indigenous rights and request clarity on the distinction between avoided emissions and removals in the context of land-based emissions.

**1. Land-based activities**

We support the inclusion of nature-based activities in the Article 6.4 removal framework, as these activities can simultaneously support human well-being, climate change adaptation, and global biodiversity conservation goals. We support the use of lifecycle analysis (LCA) to ensure comprehensive accounting of emissions and removals.

*Considerations around afforestation and bioenergy with carbon capture and storage (BECCS)*

If afforestation is to be included as an eligible activity, we urge the Supervisory Body to ensure that robust safeguards are in place to prevent unintended negative outcomes. Afforestation can also alter surface albedo and water availability, or increase land use pressure.[2] It can also displace native organisms or lead to conversion of ecosystems such as grasslands, which are the most imperiled and least protected ecosystems on the planet.[3]

Similarly, bioenergy with carbon capture and sequestration (BECCS) is often a prominent element of climate models, but presents significant downsides that should be accounted for with the Article 6.4 removals framework. In particular, the demand for biomass poses threats to water resources, biodiversity, land conversion and deforestation, and competition with food production.[4]

As demand for biomass feedstocks increases to support BECCS, there is a significant threat from both direct and indirect land-use change. Demand for forest biomass could drive degradation of natural

[1] We recommend consideration of the recent publication by Pörtner et al. (2023). Overcoming the coupled climate and biodiversity crises and their societal impacts, *Science*, https://www.science.org/doi/10.1126/science.abl4881

[2] See Creutzig et al. (2021). Considering sustainability thresholds for BECCS in IPCC and biodiversity assessments, *Global Change Biology-Bioenergy,* https://onlinelibrary.wiley.com/doi/full/10.1111/gcbb.12798; Pörtner et al. (2023). Overcoming the coupled climate and biodiversity crises and their societal impacts, *Science*, https://www.science.org/doi/10.1126/science.abl4881

[3] Scholtz and Twidwell. (2022). The last continuous grasslands on Earth: Identification and conservation importance, *Conservation Biology,* https://conbio.onlinelibrary.wiley.com/doi/10.1111/csp2.626

[4] See also IPCC. (2023). AR6 SYR (Longer Report), https://www.ipcc.ch/report/sixth-assessment-report-cycle/, p. 54, 73.

forests or conversion into plantation forests, which ultimately store less carbon and yield fewer ecosystem services such as wildlife habitat and clean water provisioning. Utilization of agricultural or wood product wastes and residues can mitigate these risks, but the supply of these feedstocks are not great enough to meet the full scale deployment of BECCS.[5] Moreover, as aptly noted by the Supervisory Body, biomass that was not intentionally grown for bioenergy (i.e., "closed-loop biomass," in a dedicated plantation) does not actually result in "removals" as defined by the IPCC, because the removal of the CO2 from the atmosphere was not the result of any voluntary direct anthropogenic activity.[6] We recommend updating the language in Table 2, which seems to suggest that "sustained harvest of biomass from forests or dedicated energy plantations" would be potentially eligible. Instead, at best, only "biomass from dedicated energy plantations" would be additional and thus potentially eligible. BECCS should not be permitted as a removal methodology without significant restrictions to prevent environmental and social negatives. Rigorous and comprehensive LCA, inclusive of alternative uses in baseline estimation, will be particularly important if BECCS is included.[7]

The Information Note also acknowledges the considerable challenges related to assigning credits when forest-based/woody bioenergy is traded internationally.[8] In a 2022 publication, former IPCC authors and reviewers noted that IPCC accounting guidelines for bioenergy are no longer fit for purpose and are in need of an update.[9]

**2. Ocean-based activities**

The threat of climate change necessitates serious consideration of a wide suite of solutions, including ocean-based carbon dioxide removal strategies. However, ocean-based carbon dioxide removal (OCDR), whether driven by biological or engineering-based methods, remains largely untested. More research is needed to understand the potential effects, durability, benefits, and risk of these activities. OCDR could have negative impacts on marine wildlife and human communities, especially if deployed without sufficient safeguards.

Although macroalgae cultivation and sinking is the only activity specifically listed in Table 2, this remains in the "concept-stage".[10] Other "concept-stage" activities include enhanced ocean alkalinity and phytoplankton cultivation with burial or energy applications.[11] Prior to proceeding with these activities at scale, it is imperative that further research is undertaken and that a rigorous standard for measurement, reporting, and verification is developed. OCDR activities should also require thorough, timely, and transparent communication with communities.

In contrast, there are a handful of "low regret" ocean-based carbon removal activities that should also be scaled up, such as restoration of seagrass meadows, mangrove forests, and kelp forests.[12] Such activities are likely to generate co-benefits for people and biodiversity, without presenting the same risks as "concept-stage" OCDR activities.

**3. Other engineering-based activities**

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[5] Stoy et al. (2018). Opportunities and Trade-offs among BECCS and the Food, Water, Energy, Biodiversity, and Social Systems Nexus at Regional Scales, https://academic.oup.com/bioscience/article/68/2/100/4797260

[6] Information Note: Removal activities under the Article 6.4 mechanism, v4.0 (A6.4-SB005-AA-A09) (hereafter, "Information Note"), p. 12

[7] Consider projections for growth in primary wood product demand, which are expected to outpace population growth under BAU scenarios by 2050. FAO. (2022). *Global forest sector outlook 2050: Assessing future demand and sources of timber for a sustainable economy,* https://www.fao.org/documents/card/en/c/cc2265en

[8] Information Note, p. 11, 57

[9] Pulles et al. (2022). CO2 emissions from biomass combustion Accounting of CO2 emissions from biomass under the UNFCCC, *Carbon Management*, https://www.tandfonline.com/doi/full/10.1080/17583004.2022.2067456

[10] Gattuso et al. (2021).The Potential for Ocean-Based Climate Action: Negative Emissions Technologies and Beyond, *Frontiers in Climate*, https://www.frontiersin.org/articles/10.3389/fclim.2020.575716/full

[11] Id.

[12] Id.

The IPCC AR6 Synthesis Report describes the use of CDR as "unavoidable."[13] There is broad consensus that CDR will help to address legacy and unavoidable emissions from hard-to-decarbonize sectors and support progress toward net-negative emissions. Both land-based and engineering-based approaches should be considered as tools to achieve the goals of the Paris Agreement within the Article 6.4 framework.

Many of the land-based and "low regret" ocean-based activities considered in the Information Note such as restoration of forests or conservation tillage can provide unique benefits to communities, ecosystem functioning and biodiversity conservation. Yet engineering-based activities can complement these approaches and offer benefits of their own. The amount of land required to achieve maximum land-based CDR in some models is astounding–perhaps requiring an expansion of cultivated land for energy feedstocks equivalent to nearly one to two and a half times the size of India,[14] while the world simultaneously grapples with other land-use pressures, the potential for large-scale climate-driven displacement, and development constraints. In contrast, many engineering-based approaches require modest or even negligible land footprints. They have potential for scaling up permanent removals, with very low risk of reversal, especially due to ongoing climate disasters and human activity.

Contrary to the claim made in Table 2,[15] which outlines the pros and cons of the approaches, some engineering-based approaches have already been technologically proven. Nearly 20 direct air capture (DAC) plants operate globally today, and currently planned projects alone could achieve deployment of 5.5 tCO2 by 2030, according to the IEA.[16] Additionally, technology-based approaches can support sustainable development goals. By one estimate, a 1 megaton DAC facility could create about 3,500 jobs across the supply chain and support related industries, such as cement and steel production.[17]

**4. Indigenous peoples**

NWF appreciates the Information Note's recommendations around social and environmental impact assessments, periodic community consultations, and the establishment of feedback and dispute resolution mechanisms, as well as its mention of free, prior, and informed consent (FPIC). We encourage, however, further strengthening of these guidelines. The Article 6.4 framework should require FPIC and a rights-based approach, particularly with respect to activities in the land sector. Robust and effective dispute resolution mechanisms must be developed.

**5. Considerations around reduced emissions from avoided conversion**

As the Supervisory Body considers projects that might be eligible under this mechanism, we wish to express our concerns around the potential for perverse incentives and unintended outcomes if activities that focus on avoided ecosystem conversion are not included.

The IPCC AR6 Synthesis Report makes clear that avoided conversion is the greatest mitigation opportunity in the land sector (and one of the top opportunities in all sectors) in this decade.[18] It may offer cost-effective mitigation potential of up to 3.9-4.3 Gt CO2e avoided emissions at less than $100 per ton in 2030.[19] At the same time, avoided conversion supplies many co-benefits related to biodiversity, sustainable development, Indigenous peoples' rights, zero deforestation, and beyond. In

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[13] IPCC. (2023). AR6 SYR (Longer Report), https://www.ipcc.ch/report/sixth-assessment-report-cycle/, p. 50

[14] Brack and King. (2020). Managing Land-based CDR: BECCS, Forests and Carbon Sequestration, *Carbon Policy,* https://onlinelibrary.wiley.com/doi/10.1111/1758-5899.12827

[15] Information Note, p. 18-19

[16] International Energy Agency (IEA). (2022). *Direct Air Capture,* https://www.iea.org/reports/direct-air-capture

[17] Rhodium Group (Larsen et al.). (2020). *Capturing New Jobs and New Business: Growth Opportunities from Direct Air Capture Scale-Up,* https://rhg.com/research/capturing-new-jobs-and-new-business/

[18] See Figure 4.4, p. 69 of IPCC. (2023). AR6 SYR (Longer Report), https://www.ipcc.ch/report/sixth-assessment-report-cycle/. Reduced conversion of ecosystems has more potential than any other mitigation option except solar power through 2030, more than half of which is available at $0-20 USD per tCO2.

[19] Cook-Patton et al. (2021). Protect, manage and then restore lands for climate mitigation, *Nature Climate Change,* https://www.nature.com/articles/s41558-021-01198-0

particular, strategies to protect areas containing "irrecoverable carbon" (carbon stored in the biosphere that is vulnerable to loss from human activities and which could not be recovered or re-sequestered in the land sector by mid-century) should be prioritized.[20] Globally, these include peatlands, mature tropical forests, mangrove forests, boreal forests, and seagrass meadows. These ecosystems also contain rich biodiversity.

We agree that establishing additionality is an essential element of high-integrity activities, and support the effort to ensure that credits are generated as the result of intentional human activities. However, in the case that the Article 6.4 framework completely excludes avoided conversion (or in other words, fails to encourage intentional preservation of carbon-dense ecosystems), the mechanism might accidentally *incentivize further conversion* and associated emissions. Consider, for example, a community surrounded by a fragment of primary forest, storing large amounts of carbon and furnishing wildlife habitat, adjacent to agricultural land. Project developers could not generate any credits from simply preserving the forest, but could–in a worst-case scenario–generate credits in the future if they clear the forest and subsequently plant a monoculture tree plantation as "reforestation." This hypothetical illustrates the tension between rewarding only removals from "voluntary direct anthropogenic activity" (even those potentially involving degradation) and recognizing the climate benefits of ecosystem protection and conservation.[21] One alternative might be to allow projects focused on avoided conversion to generate only modest credits for avoided emissions, which could reduce motivation to exaggerate the risk of loss, but still allow these projects to claim credit for the incremental carbon sequestration and storage in the ecosystem, ideally over a multi-decadal crediting period. We urge further consultation on this issue, to consider ways to recognize the value of standing forests and other ecosystems. This would create parity with some of the other potentially eligible land-based activities and provide access to much-need financial investment in ecosystem protections.

We are grateful for the opportunity to submit these comments for your consideration.

[20] Goldstein et al. (2020). Protecting irrecoverable carbon in Earth's ecosystems, *Nature Climate Change,* https://www.nature.com/articles/s41558-020-0738-8

[21] See, for example, Roebroek et al. (2023). Releasing global forests from human management: How much more carbon could be stored?, *Science*, https://www.science.org/doi/10.1126/science.add5878