Removal activities under the Article 6.4 mechanism

Novocarbos response to information note

Novocarbo is grateful for the opportunity to provide feedback on the Article **6.4 Supervisory Body's especially on the information note "Removal activities under the Article 6.4 mechanism" (A6.4-SB005-AA-A09 version 0.40).**

Novocarbo is a CDR company and is driving decarbonization: The German Start-up operates carbon removal parks that will enable it to remove up to 1 million t of CO_2 from the atmosphere by 2030. Using modern pyrolysis technology Novocarbo processes plant residues into biochar, a negative emission technology called BCR Biochar Carbon Removal. The carbon present in the biomass is bound and stored in the biochar, a product that has a variety of Co-Benefits when used in agriculture or construction. The pyrolysis process also produces regenerative, climate-neutral excess energy.
As a pioneer in the trading of carbon removal certificates, Novocarbo plays a leading role in the development of carbon removal solutions.

The Role of Removal and Engineering-based Removal

We ask the Supervisory Body to align with the scientific community, as reflected in the IPCC AR6 report, which emphasizes the necessity of carbon removal alongside strong global efforts to reduce greenhouse gas emissions. It is critical to accept this conclusion as the basis for consideration of Article 6.4.

We advocate for clear national and international targets for large-scale CDR by 2035, 2040, and 2045 in order for the CDR to have the effect it should. These targets have to be distinct from emission reduction targets and aligned with the goal of limiting global temperature increase to 1.5°C. We also support and see the need for the implementation of a range of regulatory and financial incentives, such as direct procurement, project-based support, or outcome-based subsidies.

To create a world-class CDR framework, clear quality standards for CDR credits must be established, based on the principles of permanence, verifiability, sustainability, additionality, and quantifiability, while being technology neutral. Equitable use of CDR is critical from both a climate and community perspective to address the historic responsibility of fossil fuel-based economic development in collaboration with developing countries.

Technological or Engineered Removals and Biochar Carbon Removal BCR

We strongly encourage the Supervisory Body to adopt the definition of carbon removal provided by the IPCC, which describes it as "anthropogenic activities removing carbon dioxide (CO2) from the atmosphere and durably storing it in geological, terrestrial, or ocean reservoirs, or in products." Especially to not limit the storage is important to cover the scope of technologies in the evolving CDR market and to not limit the innovation to the most known technologies today. This definition, developed and extensively discussed by scientists and experts, should form the basis for the future Article 6.4 mechanism.

We disagree with the claims in Table 3 regarding "engineered" CDR activities. These claims are unsubstantiated and ignore real progress in carbon removal.

It is important to recognize that CDR will need to be deployed at gigaton scale to achieve the 1.5°C or 2°C temperature rise targets outlined in the IPCC AR6 synthesis report. Rather than delaying progress out of caution, the focus needs to be on accelerating the testing and validation of high-potential pathways to reduce uncertainties, that certainly do remain in technology-based CDR today.

Allow us to highlight just recent science published on Biochar Carbon Removal BCR changing the view on permanence for biochar. To hinder further investments and innovation by excluding CDR in Art 6.4, or by vague commitments is an omission that the world cannot afford.

Extensive research in organic geochemistry and organic petrology confirms that biochar, when produced at temperatures exceeding 600 °C, exhibits exceptional stability. Microscopic analysis shows that biochar shares characteristics of carbon aromatization and molecular ordering with very stable forms such as anthracite. Recent studies by Sanei et al. (2023) show that biochar produced at such high temperatures exhibits chemical inertness and resists degradation by surface processes such as oxidation or biodegradation. Furthermore, all biochar samples studied consist of over 97% "inert organics," indicating their remarkable inertness. In addition, there is a growing scientific consensus that 75-80% of biochar consists of highly stable aromatic carbon rings with a shelf life of thousands of years. This means that biochar produced from high temperature pyrolysis is a durable and permanent CDR technology that can sequester carbon for thousands of years.

Monitoring, Reporting and Accounting

For BCR there are a number of methodologies and standards in the voluntary market available, all with robust MRV and some already ICROA certified like Puro.earth or verra. Additionally, there are more standards in BCR like the C-Sink Standard by CSI that follow a general good practice of a full LCA. They address emissions from biochar production, biomass harvesting and transport, biochar treatment and transport, and the degradation of the non-stable fraction of biochar over time.
Within the voluntary market a robust standard has therefore evolved, and registries are public available to avoid any kind of double counting. Following the GHG protocol most standards

guarantee a permanence in the credit for 100 years, while knowing that biochar will be stable for longer timeframes reaching > 1000 years.

We advocate a more flexible approach to the permanence of carbon removal and oppose arbitrary time limits, e.g., 1,000 years, emphasizing instead the importance of considering periods of "at least several centuries." This is in line with the recommendations of the European Union, which takes into account all technical measures for carbon removal and avoids setting rigid limits

Biomass

A sustainable use of biomass is integrated as a mandatory in the main standards and methodologies used for BCR in the voluntary market. A project with unsustainable use of biomass is not eligible for carbon credits under Puro.earth, the CSO or the verra Standard. Furthermore, as logistic emissions will be deducted from a carbon removal potential Suplliers are incentivized to regional sourcing. Some standards have a threshold of < 100km sourcing radius for the biomass.

As BCR is incentivized to use waste biomass or other biomass in a secondary use, biomass eligibility is high and sourcing biomass is not a problem. A recent study of the Imperial College London study estimated the following: In order to achieve 100 megatons CO2 by 2040, 19% of the available biomass residue streams would be required.

Environmental and Societal Impacts: SDG

We urge the Supervisory Body to consider that engineering-based carbon dioxide removal (CDR) methods, including BCR, have the potential to contribute significantly to addressing both environmental and societal impacts, notably through the production and utilization of biochar.

Biochar carbon removal can contribute to several Sustainable Development Goals (SDGs) while considering the objective of avoiding other negative environmental and social impacts associated with carbon dioxide removal (CDR) methods.

Regenerative Agriculture

Biochar can play an important role in the transformation to regenerative agriculture. Regenerative in this context means that a biodiverse fertile soil and resistance of plants is rebuilt, leading to restoring ecosystems. Biochar induces a systematic change in our agricultural system by counteracting the causes of e.g., biodiversity loss and degradation of our soils, instead of the symptoms (meaning it is enhancing agricultural production by reducing diseases and increasing functionality).

This can be exemplified through biochar's ability to improve soil fertility; support soil organic carbon buildup; its water holding capacity; nutrient leakage prevention, safeguard water resources and support animal health.

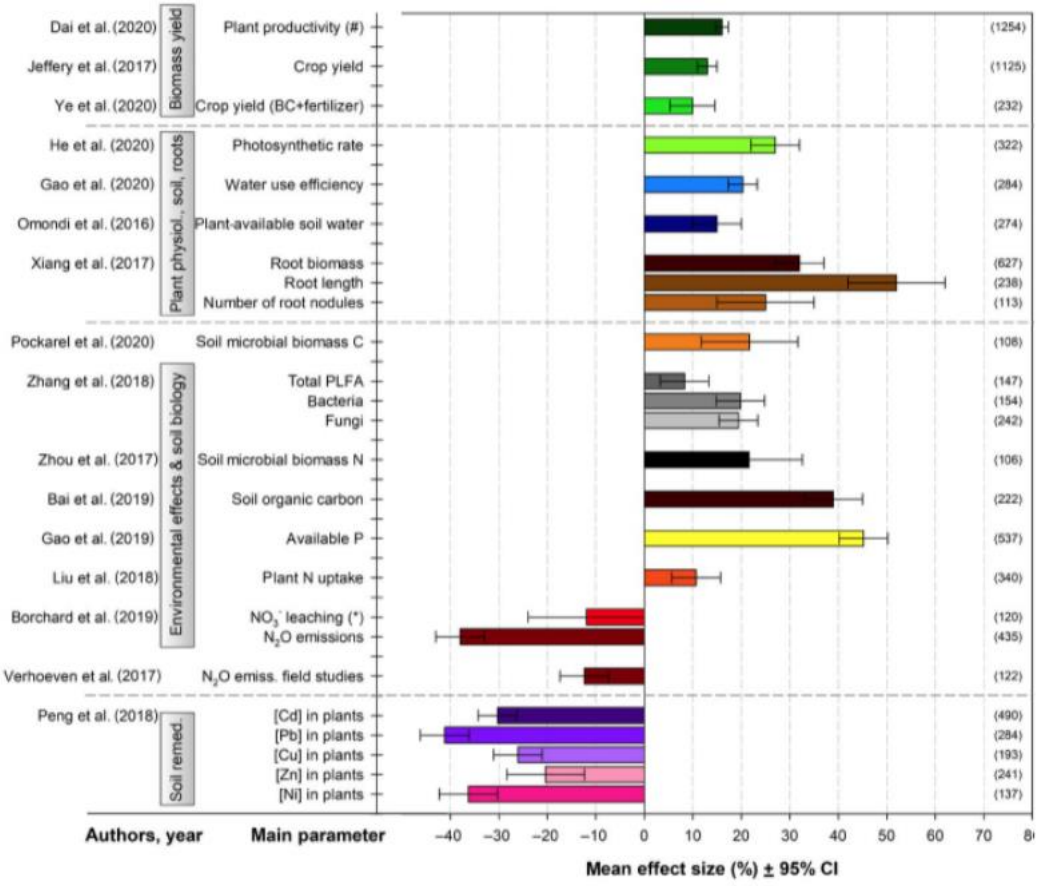

FIGURE 5 Selected parameters with the highest agronomic relevance that were investigated in the 26 reviewed meta-analyses. The mean overall effect size (% change) and 95% confidence intervals are given as reported in the original studies. The numbers in parentheses indicate the number of pairwise comparisons used for that specific parameter. Article Schmidt, H.P., Kammann, C.,Hagemann, N.,Leifeld, J.,bucheli, T.D., Sánchez Monedero, M. A., & Cayuela, M.L. (2021). Biochar in agriculture- A systematic review of 26 global meta- analyses. GCB Bioenergy, 13, 1708-1730. https://doi.org/10.1111/gebb.12889

Regenerative Energy for Hard-to-abate Sectors

Hard-to-abate sectors contribute to approximately 30% of global emissions. BCR aims to support these sectors in their transition phase to NetZero emissions. Especially, companies from the building and manufacturing sector (steel, cement, aluminums, industrial chemicals) will benefit from the expertise in operating pyrolysis systems to provide regenerative heat onsite at their production facilities. While we can generate regenerative power with different technologies, for regenerative process heat there are very few solutions available, while industries need high temperatures.

Novocarbo

Economic Growth and Work Opportunity

With every carbon removal parks we generate local employment opportunities and feed green energy into the local grid system, nurturing the local economy and supporting regional development.

Circular Economy

Biochar works as a substitute for fossil carbon. As biochar is made from waste residues, our product is closing product use cycles and therefore supports the transition to a circular economy.

By adhering to these considerations, biochar can effectively contribute to SDGs such as No Poverty (SDG 1), Zero Hunger (SDG 2), Responsible Consumption and Production (SDG 12), Climate Action (SDG 13), and Life on Land (SDG 15). Biochar offers the potential for sustainable agricultural practices, improved soil health, increased carbon sequestration, and enhanced resilience to climate change, while ensuring the avoidance of negative environmental and social impacts. This is why we suggest to the Supervisory Body to fully recognize its potential in the Article 6 publications.

Conclusion

We thank you for the opportunity to contribute to the integration of carbon removal into Article 6.4 of the UNFCCC.
Our main points are:
- The recognition of technology-based removal methods such as carbon removal through biochar BCR.
- Robust measurement, reporting and verification (MRV) tools and collaboration with insurers are critical to building trust and financial resilience.
- Biochar production and application are consistent with the SDGs, providing environmental and social benefits while avoiding negative impacts.

In summary, integrating carbon removal can achieve the Sustainable Development Goals and make significant progress in our efforts to combat climate change.

Yours sincerely,

Venna von Lepel
CCO/CMO Novocarbo