

UNFCCC Article 6 Call for Input

Carbuna AG appreciates the opportunity to provide commentary and input regarding Article 6.4 (especially on the information note A6.4-SB005-AA-A09 version 0.40) and the integration of carbon dioxide removal – more specifically: the integration of biochar carbon removal (BCR).

Carbuna AG is a Germany-based company that focusses on the processing and sale of biochar in various forms and products. Carbuna was founded in 2015 and is active in several European countries. We consider ourselves a platform for biochar that links the production and demand side of the biochar economy. Carbuna AG is one of the pioneering companies in trading carbon removal certificates based on biochar and is working closely together with MRV-company carbonfuture GmbH, Freiburg. Voluntary market certificates from Biochar Carbon Removal (BCR) have become one of the major drivers of Carbuna AG's growth in the recent years and are expected to become even more important in the future.

CDR and Biochar Carbon Removal (BCR)

Carbuna AG agrees with the IPCC's conclusion that CDR is an essential puzzle piece to maintain the 1.5 °C goal of the Paris Agreement and that CDR must be scaled up in unison with a quick and drastic reduction of GHG-emission. In our opinion BCR is the most accessible, economic and scalable engineered CDR-method, but all viable CDR-technologies should be supported by policy and intergovernmental bodies due to the urgency of the climate crisis.

BCR describes the production of biochar from a vast array of biomasses by pyrolysis or (some) gasification technologies, if the produced biochar is put into a matrix that prevents oxidization and thus guarantees that the permanent carbon in the biochar will remain intact. Another co-product of the pyrolysis are oils and gases that can be condensated to be used a basis for chemicals, but are mostly burned in the process in order to generate energy in form of heat and/or electricity. Its ability to generate biochar as a usable product and energy or chemicals as co-products gives BCR a unique economic advantage compared to other engineered CDR-technologies.

The permanence of biochar in the environment and in geological terms is the cornerstone of BCR. Biochar's permanence has been questioned in many policy papers on CDR, but recent studies show, that most parts of biochar must be considered permanent on a geological timescale.¹ With more advanced analysis a biochar's many carbonaceous components can be monitored for permanence individually and it was been found that the majority of biochar content's stability is comparable to Inertinite, a inert, mineral form of fossil carbon, which does not degrade at all. With this new approach more volatile components can be separated and only the permanent components of biochar can be used for accounting BCR. We urge the UNFCCC to acknowledge these new findings in particular as there are already mature

¹ <https://biochar.systems/durability-statement/>

solutions for MRV in place. With this said, biochar is clearly an engineered CDR solution and should not be considered a nature-based solution.

The European BCR industry has been growing its capacity exponentially, with a 3-year CAGR of 68 %. By the end of 2023 150.000 t of CO₂-eq. are expected to be sequestered using BCR in Europe alone², making BCR the most relevant engineered CDR-technology in Europe. Based on the current growth rates, the European Biochar Industry expects a CDR-potential of 5 Mt CO₂-eq by 2030 in Europe alone, while biochar is also picking up traction in China, North America and in the form of artisanal production in many regions of the Global South.

However, biochar is facing an uphill battle in policy making, which could hinder its continued growth. Policy makers often assume that biochar is a nature based solution, due to its hybrid approach of using biomass and having end-points in soil, and thus the inherently limited permanence of carbon in nature based solutions is applied to biochar on the basis of categorization. We propose that categorization and taxonomy should not be used to prejudge any CDR-solution simply by applying certain assumptions and properties to any technology in a category. Since the amount of CDR-solutions is very limited, we propose that each solution should be analyzed individually based on its properties before basing any judgement on categorization. However, if taxonomy is unavoidable BCR is clearly an engineered solution.

While the voluntary CDR market is currently driving BCR growth, we believe that the CDR market has to be regulated and turned into a mandatory market as soon as possible. Including BCR as an engineered solution in a mandatory CDR market is key to creating further incentives to use biochar in a permanent application and thus creating a carbon sink. We already see an alternative path for biochar in the metallurgy market, that is competing with BCR. While it makes sense to replace all fossil carbon with biogenic carbon in metallurgy and thus offset large fossil emissions, bringing too much biochar into the metallurgy market also hinders technology transformation towards carbon-free alternatives (hydrogen, electric heating). However, some metallurgy applications will always require carbon and this can only come from regenerative sources. Anyhow, BCR and metallurgy will compete for biochar in the coming years and higher demand on the CDR market would help the transition of the metallurgy industry.

BCR is already a well-monitored voluntary market with several industry standards and MRV-players. While Carbuna AG prefers to work with the EBC C-Sink certificate, one of the major standards, we also acknowledge other well made standards, such as Puro, but we see a increasing number of predatory players that create their own, poorly implemented solutions in order to partake in this attractive voluntary, and thus mostly unregulated market. We therefore ask the policy makers to speed up efforts for more standardization in this field.

Regarding safety, biochar is already well regulated by national laws, EU-law and industry standards, like the European Biochar Certificate EBC within Europe. Therefore, we see no risk in scaling up application in natural and build environments or long-lived products.

Biochar can achieve several co-benefits in products and soil. In agriculture it can promote yield, by using unwanted biomass methane emissions can be avoided and it also decreases the emissions of other GHG, like nitrous oxide from nitrification, and promote the growth of soil

² EBI market report 2023 www.biochar-industry.com/market-overview/

organic carbon.³ However we believe that these co-benefits should be accounted separately from BCR.

In conclusion we would like to point out that BCR/biochar will most likely be the leading CDR technology solution in the coming years and that its growth should be promoted by policy in order to scale it up as quickly as possible. The permanence of BCR should be acknowledged according to the most recent findings and BCR should be filed under engineered solutions if taxonomy is unavoidable. We would like to thank the UNFCCC once again for this opportunity and hope that our input is of value to you.

Yours sincerely,



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³ Schmidt et al. (2021), Figure 2 <https://onlinelibrary.wiley.com/doi/full/10.1111/gcbb.12889>