

FAQs

What is biochar?

Biochar is produced by thermal carbonization (pyrolysis) of biomass such as waste wood, hedge trimmings as well as other biogenic residues e.g. from the food industry. Due to its porous structure and high internal surface area, biochar can store water or nutrients and be used as a filter material. These properties make it a true all-rounder that can play an important role in agriculture, industry and construction, for example.

What is BCR = Biochar Carbon Removal?

The abbreviation BCR stands for "Biochar Carbon Removal". This process uses carbon stored in biomass via photosynthesis as a source for carbon removal. Biomass (organic residues) is heated at high temperatures and in the absence of oxygen. This is called pyrolysis. In this conversion process, the organic compounds of the biomass are thermo-chemically split and all volatile components pass into the gas phase. What remains is carbon in a solid, easily storable form: Biochar. This process can yield various products, including biochar and renewable energy.

How does the pyrolysis process bind CO₂?

The basis is the carbon contained in plant residues. In the natural carbon cycle, this would be released back into the atmosphere as CO₂ via decay of the biomass or, for example, through forest fires. BCR (pyrolysis) transforms the carbon from the gas phase into a solid form that can be stored over the long term, so that it is safely sequestered for thousands of years: in biochar.

What makes biochar a soil improver?

Biochar supports the additional build-up of humus in the soil and prevents the leaching of phosphorus and nitrate. It also reduces nitrous oxide emissions on agricultural land and minimizes the need for irrigation. In addition, the resistance of plants to fungal diseases is increased. As an additive in the earth industry, biochar can replace peat and thus contribute to the preservation of peatlands, whose degradation in peat extraction causes methane emissions, a greenhouse gas that is around 28 times more harmful to the climate than CO₂.

What other positive properties does biochar have?

Cities can be made more climate resilient and livable through filtration and water retention if biochar substrates are used for stormwater management and "blue-green" infrastructure projects such as urban trees, rain gardens and green roofs. In addition, applications are growing in the area of industrial materials. For example, biochar can replace some of the cement and sand in concrete in the production of concrete. At the same time, the product properties of the concrete can be improved. Biochar also proves advantageous as a filler: it has very good insulating properties. In particular, Novocarbo is currently working with the textile industry on ways to make biochar suitable as a substitute for non-sustainable materials.

What can biochar be used for?

Novocarbo's biochar is mainly used as a soil conditioner, peat substitute in the earth industry, or in stormwater management for blue-green infrastructure projects. In addition, biochar replaces fossil or high emission resources in industry. Examples here include molded parts, housings and functional

parts made of plastic, floor coverings or use as concrete aggregate. Novocarbo's goal is to accelerate the active decarbonization of the industry with its economically viable products.

What is Carbon Dioxide Removal (CDR)?

Carbon Dioxide Removal (CDR) involves methods for removing CO₂ from the atmosphere and then storing it permanently. Climate neutrality cannot be achieved without CO₂ removal, because in all scientific scenarios residual emissions will remain even with very ambitious reduction measures. These unavoidable residual emissions are neutralized by active removal from the atmosphere (CDR). Therefore, to stay on the 1.5-degree or 2-degree target, rapid scaling of CDR technologies is essential.

Why does the pyrolysis process save CO₂ emissions in addition to carbon removal?

During pyrolysis, process heat is generated. This heat is excess heat and all emissions from its generation are already added to the biochar CO₂ balance. Therefore, this heat is CO₂ neutral and can be supplied as renewable energy to industries or fed into local heating networks. There it replaces fossil energy sources such as gas and thus saves these emissions.

Who is Novocarbo?

Novocarbo is driving decarbonization and the expansion of renewable energy with a unique product concept: The Hamburg-based start-up operates carbon removal parks that will enable it to remove up to 1 million t of CO₂ from the atmosphere by 2030. Using modern pyrolysis technology in the form of Biochar Carbon Removal (BCR), Novocarbo processes plant residues into biochar. The carbon present in the biomass is bound and stored in the biochar, which has a variety of positive effects in the agriculture, construction and textile industries. The pyrolysis process also produces regenerative, climate-neutral excess energy. This can be offered to companies or municipal utilities in the form of "heat-as-a-service" partnerships. As a pioneer in the trading of carbon removal certificates, Novocarbo plays a leading role in the development of carbon removal solutions.