Research content for the short video: Biochar_Utopia 2025

"IMAGINE a FUTURE...

where we remove & use CO_2"

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Biochar: New inventions enable the affordable and effective storage of CO_2 in many goods.

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Biochar 2050: From utilization to regeneration – The biochar world of tomorrow

The world of 2050 is characterized by a paradigm shift in materials management. Biochar, once a by-product, has become a key resource in the renewable circular economy. It is not just a material, but an essential element for restoring natural cycles.

Material-centered approach: Biochar as a source of added value: Biochar is no longer viewed solely as a soil conditioner or building material additive—it is a product that retains its value over time and has a wide range of functions. Whether in soils, building materials, or industrial processes, biochar is used specifically to sequester carbon, close material cycles, and conserve resources.

Cities for carbon reduce: Instead of climate-damaging building materials, buildings today are made of highly porous biochar building elements that regulate moisture, store heat, and bind CO_2 in the long term. Cities are no longer sources of emissions, but active carbon sinks that have a positive climate effect thanks to biochar building materials.

Soils as storage and filters: Biochar is the backbone of regenerative agriculture. Soils worldwide are enriched with biochar, which helps them retain nutrients, store water, and stabilize agricultural yields. This targeted use has doubled humus content and made global food production more resilient to climate change..

Innovative approaches

- **Carbon Retention-Driven Design:** Every product containing biochar is developed with the goal of long-term carbon sequestration. Instead of short-lived applications, the focus is on longevity and recyclability.

- **Negative Emission Economy: C**ompanies and cities no longer just account for emissions, but also for the amount of carbon that is actively removed and stored by biochar. Biochar has become the central currency of carbon markets.
- **Maximizing biochar value creation:** Biomass residues are converted into valuable biochar worldwide by decentralized pyrolysis plants. The cascade of uses is optimized: From industrial applications to the construction industry to soil improvement, biochar goes through various life cycles before being stored in soils for the long term.

Ecological and economic advantages

- CO_2 storage instead of emissions: Biochar in building materials and soils stores billions of tons of carbon.
- Stable value thanks to material passports: Every biochar product is traceable and integrated into digital carbon balances.

The world of 2050 has changed—not only in terms of technology, but also in terms of values. **Carbon is no longer seen as a threat, but as a resource that can be shaped.**

Biochar is the symbol of a new ecological age in which the economy, the environment, and society are in harmony.

Research at the site:

- **"Biochar" - Green Tech Radar: Kohlenstoff aus Biomasse; neueste Entwicklungen & Marktpotenziale: https://www.greentech.at/green-tech-radar/green-tech-radar-biochar/**

- **BEST Bioenergy and Sustainable Technologies**: https://best-research.eu/content/de?field-search=biochar