

A brief introduction to CONTRA CS 2: BWC

Main focus: conversion of BW to biochar as a solid fuel



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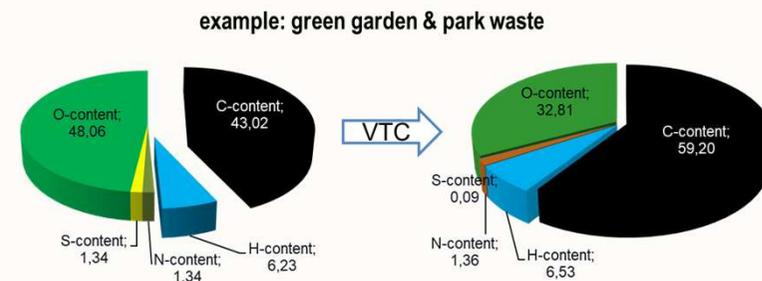
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What is Vapothermal Carbonization (VTC)?

- Thermo-chemical process
- Converts biomass to biochar (or: „biomass carbonizate“)
- Conditions: 220°C + 23 bar in saturated steam atmosphere
- Reaction time: ~3 hours
- Increases relative carbon concentration in organic molecules by removal of heteroatoms (mainly O, S, N and H).
By-products: mainly H₂O, some H₂S, SO₂, NO_x



What is biochar?

Solid fuel

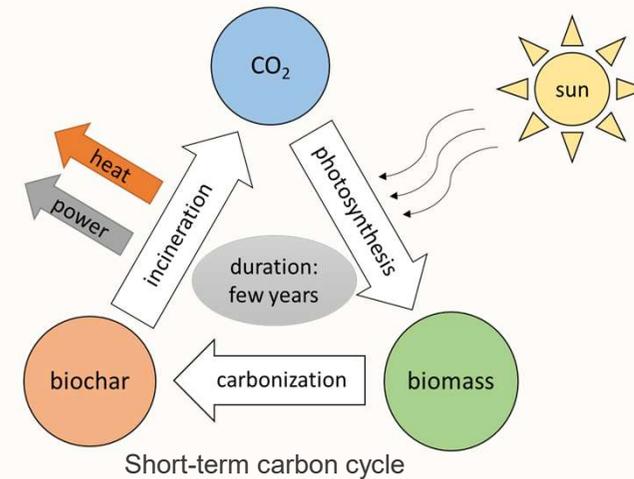
- Replacement for fossil coal (hard coal, lignite)
- Carbon neutral

Soil improving agent („terra preta“)

- better water holding capacity,
- habitat to microorganisms, etc.

Raw material for further refining

- activated carbon e.g. for filtration
- pharmaceutical carbon source



Preparing the biochar bed for urban tree allee plantation in Stockholm. (from: www.biochar-journal.com)

Experimental VTC reactor



Reactor with open pressure vessel



... and closed pressure vessel

- 15l reaction chamber
- electric jacket heating
- monitoring of pressure and temperature

Biochar from beach wrack obstacles

Main problem: high sand input from beach cleaning

VTC process is very robust

- the reaction is not affected by salt or sand
- biomass to biochar works fine

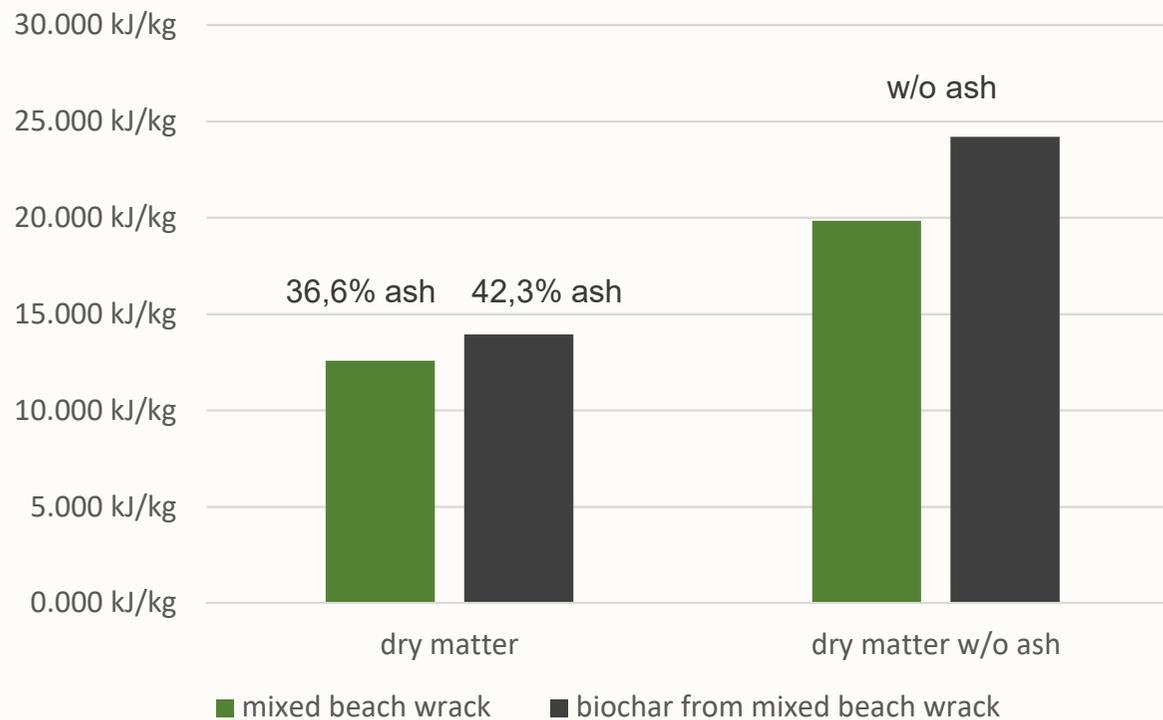


But inert admixtures

- pass the reaction unaffected and stay in the biochar
- lower the biochar's calorific value
- separation of fine particles (like sand) is complicated and expensive

An example: the effect of sand in biochar

Calorific Value: beach wrack biomass and biochar



**Thank you very much
for your attention!**