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A multi-purpose approach to empower the circular bioeconomy?

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Phytoextraction and thermal biomass processing – a multi-purpose approach to empower the circular bioeconomy?

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Abstract

The METRIK research group at the Department of People & Technology at Roskilde University in Denmark is a diverse group of academic experts that work problem oriented and inter disciplinary with a holistic system perspective to support development and planning of sustainable development especially related to environmental issues within socio-ecological systems. One of the central R&D areas in the METRIK group is the development of new value chains for a circular bioeconomy. The topic is addressed from many angles from the technical to the social sphere around a nexus of; i) soil restoration and development, ii) biomass production, iii) biomass conversion and use, and iv) nutrient re-procurement, re-production and recycling.

A special case within this research area is the combination of phytoextraction and thermal biomass processing in a biorefinery context to remediate soil health and fertility while producing materials and products for new circular bioeconomy value chains. This approach is presented here as a way to feed value directly into the circular bioeconomy while simultaneously increasing the economic resource base on the long term. This short presentation discuss some of these potentials and describe a generalized example of such a system where the focus is on pyrolysis as a process that may provide thermal purification of toxic biomasses grown for phytoextraction of polluted soils and the related production and use of biochar as nutrient carriers and soil enhancer substrates.