

Experiences from the private biochar laboratory

Fifth Innovation
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NORDIC BIOCHAR EXPERT LAB

Climate positive expertise,
materials and products

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NORDIC BIOCHAR EXPERT LAB

Fifth Innovation's journey started in 2018

Laboratory and team in Kangasala

Our laboratory operates as outsourced R&D- and sample development unit, producing material samples. Payloads ranging from grams to kilograms.

Fifth Innovation customers are mostly Nordic industrial organizations.

We also cooperate closely with universities and research organizations when most of analytics are outsourced.

Our laboratory offers possibility to test different feed stock options by using:

- Slow to intermediate pyrolysis
- HTC (Hydro Thermal Carbonization)
- Optimize process parameters for biochar production
- Option for Liquid and Gas fraction samples
- Bio-based additives and activated carbon development





OUR SERVICES

EXPERT SERVICES

Outsourced biochar, thermo-chemical and industrial side stream processing unit. Trusted by industry leaders in biofuel, biogas and biomaterial sectors.

TECHNOLOGY EVALUATIONS & ANALYTICS

We design and facilitate application specific performance tests, eg. performance benchmarking of activated carbon in various use cases. We offer our technological expertise with processes, such as:

- Slow to fast pyrolysis
- HTC (Hydro Thermal Carbonization)
- Bio-based additives and activated carbon design
- Lignin separation & utilization
- Industrial environmental systems
- TEA calculations

PROCESS INTEGRATIONS

Senior expert integration design of thermo-chemical process integration into major scale facilities brings direct benefits in profitability.

What if there was a better way?

INDUSTRIAL SIDE STREAMS: THE NEXT GENERATION OF BIOCARBON

Currently, side streams of **biorefineries, forest industry and many agricultural products** are burned as energy. This is a low refinement level end use case that is not only harmful for the climate, but economically insensible. Refining side streams into higher value products brings next generation winners in the Nordic industrial ecosystem.

Revenue potential estimations for 500 000 tonnes of wood “waste”:

- | | |
|-------------------------------|-------------|
| ● As energy: | 40-70 M€ |
| ● As soil improvement biochar | 80-120 M€ |
| ● As carbon black alternative | 100-250 M€ |
| ● As activated carbon | 150-300 M€ |
| ● As construction materials | 400-1500 M€ |

40-70 mil €

Revenue
potential as
energy

>1000
mil €

Revenue
potential as
construction
materials



ELEVATING RAW MATERIALS INTO NEXT GENERATION PRODUCTS FOR A CLIMATE POSITIVE FUTURE

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