SUCCESS STORY

**BEST / BE2020_2.0**
**BEST – Bioenergy and Sustainable Technologies GmbH / BIOENERGY 2020+**

Programme: COMET – Competence Centers for Excellent Technologies

Programme line: COMET-Centre (K1)

Type of project: Non-COMET, GreenCarbon Lab, strategic project, 01/2022 – 05/2023, funded within NÖ R&D&I Infrastructure call


# GREENCARBON LAB FOR RESEARCH ON THERMOCHEMICAL BIOREFINERIES

## RAW MATERIAL TESTING, CARBON PRODUCT PRODUCTION, TECHNOLOGY DEVELOPMENT, ENERGY INTEGRATION, DEMONSTRATION, MONITORING.

In the GreenCarbon Lab at BEST´s research location in Wieselburg, simple biorefinery concepts for the production of sustainable carbon products – GreenCarbon – by means of pyrolysis are investigated.

Based on many years of experience in the field of energetic biomass utilization, further developments of thermochemical conversion technologies focus on the valorization and utilization of residual materials and the production of renewable carbon products. Pyrolysis is a promising technology in this regard. BEST's focus here is in the field of technology development in order to design processes that are as flexible as possible with regard to the input material and to manage these processes in such a way that green carbon products with defined product properties can be produced.

From previous R&D projects (such as Pellet Burner of the Future, BEST, GrateAdvance, ...) there is a lot of know-how on the applicability of various raw and residual materials as well as high expertise in the field of thermochemical conversion processes. At the same time, unique laboratory infrastructure has been built to enable systematic characterization of such processes – in addition to standard analytics, thermogravimetry, a single-particle reactor and a laboratory reactor are available. In order to close the gap to application-related R&D issues, continuously operated experimental reactors were required to enable systematic research and further development of such technologies.

Federal Ministry
Republic of Austria
Climate Action, Environment, Energy, Mobility, Innovation and Technology

Federal Ministry
Republic of Austria
Digital and Economic Affairs

Version 01/2020

Based on these considerations, an overall concept for a corresponding R&D infrastructure was developed - the GreenCarbon Lab:

Core components of the GreenCarbon Lab are two pyrolysis units at different scales that can convert various organic residues into renewable carbon products – i.e. biochar, bio-oil and gas – through pyrolysis. A pilot plant provides the opportunity to test new feedstocks and investigate their specific behavior under different process conditions, as well as the quantity and quality of the resulting products. The pilot-scale pyrolysis plant makes the transition from research to demonstration unit. Findings obtained in the laboratory are implemented and validated at this plant, with the aim of producing GreenCarbon products with defined properties. The capacity is selected in such a way that product batches can be produced in larger quantities for subsequent application tests – e.g. as part of industrial trials at company partners. The units are equipped in such a way that relevant process parameters can be controlled and adjusted in a targeted manner. At the same time, process data are obtained via suitable measuring and sampling points to ensure detailed process analysis.

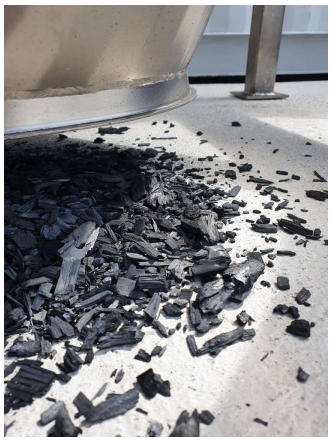
The GreenCarbon Lab was co-financed by the EFRE-fund via the province of Lower Austria.

Pilot-plant in container on the Wieselburg site of BEST GmbH, Source: BEST GmbH

**Impact and effects**

The utilization of residues for the production of valuable products is a central prerequisite for functioning circular economy concepts. Application of such products further creates the possibility of carbon storage (BECCS).

Increased R&D activities also support the technological leadership of Austrian companies in the field of sustainable technologies. Demonstration, monitoring and the creation of a database for possible standardization processes sustainably support the development and expansion of such thermochemical biorefinery systems. Increased regional value creation and the associated creation of regional jobs also provides structures for socially sustainable developments.



Biochar made of wood chips, Source: BEST GmbH

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**Project partner**

- voest Alpine Stahl Donawitz GmbH (co-financing)
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This success story was provided by the centre management and by the mentioned project partners for the purpose of being published on the FFG website. BEST – Bioenergy and Sustainable Technologies Gmbh is a COMET Centre within the COMET – Competence Centers for Excellent Technologies Programme and funded by BMK, BMDW, the regional governements of Styria, Lower Austria and Vienna. The COMET Programme is managed by FFG. Further information on COMET: www.ffg.at/comet