



1 Biomass containing lignocellulose could directly be processed on the field.

FRAUNHOFER INNOVATION CLUSTER »BIOENERGY«

EXPLORING POTENTIALS OF BIOMASS – DEVELOPING INNOVATIVE UTILIZATION CONCEPTS

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Material and energetic use of biomass are expected to make a significant contribution towards covering the worldwide need for raw materials and energy and therefore will help reducing greenhouse gases, especially CO₂.

Worldwide, immense amount of wet biomass containing lignocellulose such as rapeseed straw, grass and green waste are generated decentralized. Today, those biomasses are utilized less intensely. The reason, on the one hand, is its high water content which results in a low calorific value (low energy density), and which makes its transport and storage more expensive. Fraunhofer UMSICHT has initiated the Fraunhofer Innovation Cluster Bioenergy with the objective to increase the available and utilizable amount of biomass by development of new conversion technologies for stalk-like as well as wet biomass.

Keywords

- Wet and/or lignocellulosic biomass
- Decentralized conversion technologies
- Biomass conditioning and dewatering
- Ablative flash pyrolysis
- Hydrothermal carbonization

Sectors

- Agriculture
- Food and food-processing industries
- Energy suppliers
- Disposal companies
- Petrochemical and chemical branches
- Biotechnology
- Plant, machinery, and farm equipment manufacturers



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1 Barley straw.

2 Pyrolysis oil.

Solution approach

- More efficient production systems for biomass-based products, particularly for
 - stalk-like biomass accruing locally at the place of harvest (crop fields/farm)
 - residual fractions occurring at local or regional processing works (e.g. food production, municipal green waste)
- Conversion into hydrocarbon-rich intermediate products for the supply of raw materials and energy
- Use of logistic paths for intermediate products, such as admixture in oil refineries or for co-combustion in heat and power plants
- More efficiency and value creation in agriculture

Objectives

- Supply of mobile or decentral technologies to be implemented locally for the generation of economically transportable and storable intermediate products from lignocellulosic and/or wet biomass and related residual substances
- Objectives will be addressed in three innovation fields:
 - Conditioning of wet biomass: technologies for dewatering and fractioning of press juice based on press and membrane technologies as well as direct drying and conditioning of solid fuels
 - Processing of stalk-like biomass: Development of a technological method based on thermochemical conversion (pyrolysis) for a bio-crude oil production performed close to the place of harvest
 - Processing of biogenic residues: Development of a technology for stationary processing of wet biomass and/or biomass residuals by hydrothermal carbonization (HTC)

Participation in the Cluster

The Fraunhofer Innovation Cluster "Bioenergy" is funded by the German State of North Rhine-Westphalia (NRW) and the Fraunhofer Gesellschaft (FhG). The project is running until the end of 2015.

The objectives formulated in the framework of the Fraunhofer Innovation Cluster are implemented in cooperation with partners from industry and universities. Targeted partners are in particular enterprises based in North Rhine-Westphalia interested in collaborating in the Cluster topics. Individual agreements may be made with the cooperating partners in order to realize the objectives.

Are you interested in the topics addressed by the Cluster? – Please do not hesitate to contact us!

Funded by:



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