

Research institute:

PTS München
Hess-Strasse 134
80797 Munich

Head of the research institute:

Dr. A.-B. Kerkhoff

Project leader:

Dr. F. Miletzky
Tel: 089 / 12146-184
Fax: 089 / 12146- 591
E-Mail: frank.miletzky@ptspaper.de

Internet: www.ptspaper.de

Research area: General aims

Production economy // Production planning

Key words:

Biorefinery, JTI , biofuels, biochemicals, recovered paper, biomass, potential

Title:**Biorefinery study****Background/Problem area**

The aim of this study is the representation of the importance and possibilities of a Biorefinery Joint Technology Initiative (JTI) for the paper industry located in Germany. This study explains the future role of biorefineries as well as the meaning and opportunities of a JTI.

In general biomass can be converted into useful biofuels and bio-chemicals via biomass upgrading and biorefinery technologies. A biorefinery is a facility that integrates biomass conversion processes to produce fuels, power, chemicals and materials from biomass. Biomass includes all renewable organic materials, such as wood, agricultural crops or wastes, but also recovered paper. Upgrading processes include fractionation, liquefaction, pyrolysis, hydrolysis, fermentation, and gasification. E.g. upgraded bio-oil from biomass pyrolysis can be used in vehicle engines as fuel. The benefits of an integrated biorefinery are numerous because of the diversification in feedstocks and products. There are currently several different levels of integration in biorefineries which adds to their sustainability, both economically and environmentally. Economic and production advantages increase with the level of integration in the biorefinery. On the other hand it becomes obvious, that different new needs for biobased materials could lead to a lack for traditional applications like paper production.

Objectives/Research results

The following questions have to be answered within the study:

- Biorefinery – definition and contents
- Biorefinery – what's the relation to the pulp and paper industry
- Biorefinery – prospects and risks
- What are the requirements to participate in the JTI biorefinery

Therefore the overall objective of this study is to give an overview on existing development work and projects dealing with the biorefinery concept, especially focused on the use of lignocellulosic feedstocks.

Out of the raw material wood and by-products from pulp manufacturing arise multiple prospects of integrated biorefinery. Beneath a few examples of pilot-scale plants such processes still have to be developed further. Furthermore recovered paper is an important feedstock that can be converted to bioenergy and biochemicals – recovered fibres e.g. could be used for biogenic plastics. For the paper industry as a part of the value added chain "wood and forest" one also has to consider the competition occurring for the use of these renewable resources.

To participate in the Biorefinery JTI companies have to do an individual situation analysis – are there possibilities and benefits for the implementation of biorefinery processes? What are the expectations and needs connected to the participation in the JTI?

Application/Economic benefits

The study will enable paper mills to recognize the economic potential of biorefinery technologies to improve their efficiency and to optimize the utilization of all resources and arisings. In times of increasing costs for energy and raw materials the integration of sustainable processes becomes more and more important. A JTI is a suitable platform to push on developments together with strong partners using the synergy effect of several sectors of the pulp and paper industry.

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Remarks

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