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Biomass based energy intermediates boosting biofuel production

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Deliverable

FACT SHEET

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Objectives

BioBoost is to pave the way for de-central conversion of biomass to optimised, high energy density carriers, which can be utilised in large scale applications for the synthesis of transportation fuel and chemicals or directly in small-scale combined heat and power (CHP) plants.
Increasing the share of biomass for renewable energy in Europe demands conversion pathways which are economic, flexible in feedstock and energy efficient.
The project studies the conversion of dry and wet residual biomass and wastes as feedstock for de-central conversion by fast pyrolysis, catalytic pyrolysis and hydrothermal carbonization to the intermediate energy carriers oil, coal or slurry.
Major activities include the

- analysis of the economic efficiency of the complete production pathways,
- the optimization of the logistic chains and
- the investigation of the environmental compatibility.

BioBoost aims at making a substancial improvement towards increasing the efficiency of the use of biomass and residues in the future.

The focus of the BioBoost project is on agriculture residues and organic wastes. These are actually occurring and economically attractive feedstock, as they are cheap or the disposal of which is paid for. Due to their secondary nature, this feedstock has the potential for high environmental sustainability, and in the case of straw, it rather strengthens food production than competing with it. Perennial, ligno-cellulosic energy crops and forest residues are included as a possibility to compensate the seasonal occurrence of for example straw.

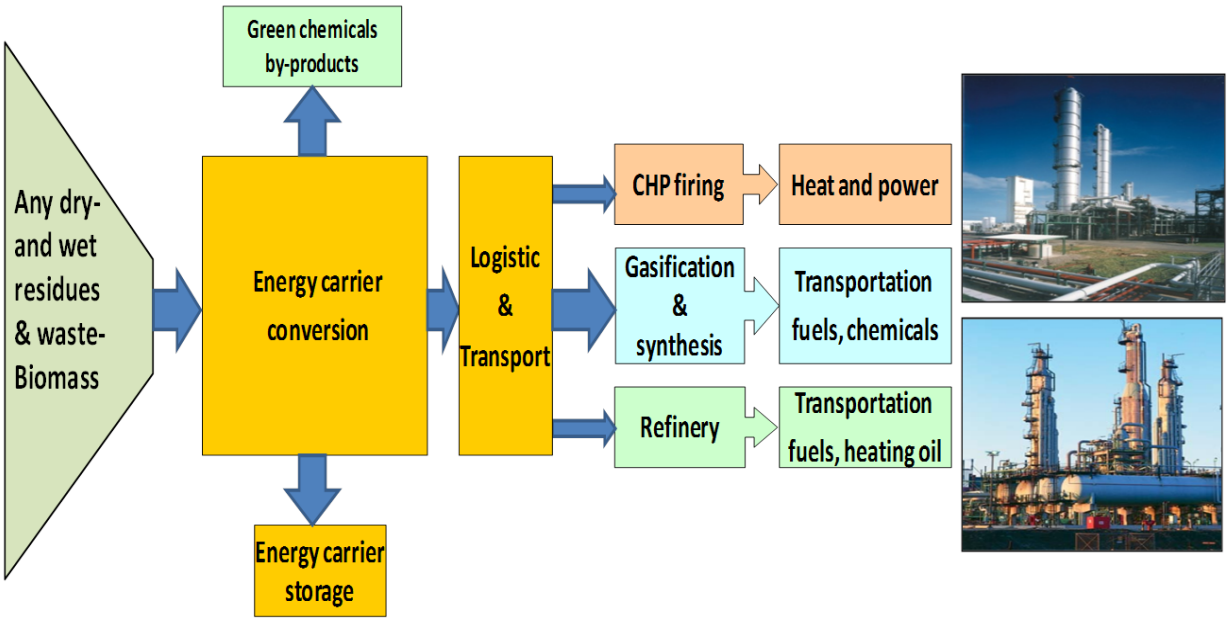


Figure 1: Overview of conversion routes for fuels and chemicals

Project Plan

The project addresses the complete value chain from analysis of feedstock potential, biomass conversion via fast pyrolysis, catalytic pyrolysis and hydrothermal carbonization to a valuable energy carrier, optimisation of transport and logistics up to the exploitation of the energy carrier and its by-products. The techno/economic and environmental assessment includes the complete supply chain.

WP 1 focuses on the technical and economical feedstock potential investigated by GIS tools based on spatial and statistical data on the level of NUTS 3, the determination of feedstock costs and the selection of the optimum conversion plant sites based on transport models including their year round feedstock supply. A GEO-portal is developed to present and display the GIS data.

WP 2 is dedicated to the biomass conversion processes fast pyrolysis, catalytic pyrolysis and hydrothermal carbonization. Feedstock is sourced and feeding to the process plants is tested. The conversion products are characterized and the optimum energy carrier identified.

WP 3 investigates the recovery of high value chemical by-products and nutrients from the intermediate products of each process.

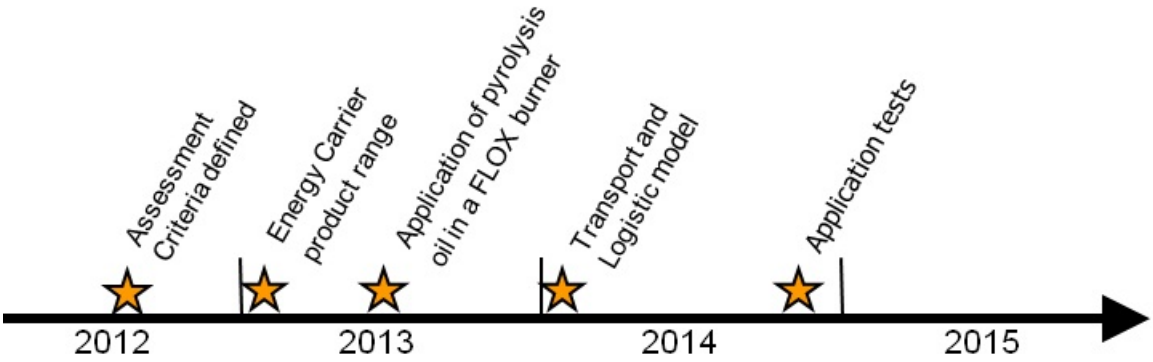
WP 4 sets up a holistic transport model taking into account data from biomass supply, de-central energy carrier production and central utilisation installations. Special attention is paid to techno/economic properties and sustainability aspects, CO2 footprint, safety aspects and risk analysis of the transport and logistic chain.

WP 5 is dedicated to the optimisation of the energy carrier use prior and subsequent to the phase-in of large scale gasification plants for synthesis of fuels and chemicals. The ramping phase when all products from de-central conversion need to be utilised in other applications is investigated and demonstrated.

WP 6 performs the technical, economical, environmental and social assessment including chain assessment, sensitivity and scenario analysis and a Life Cycle Assessment according to ISO 14040. The pathway scenarios are compared to each other, to the fossil pathways and the gasification of the energy carrier with synthesis to transportation fuels.

WP 7 is dedicated to the dissemination of the results (e.g. Workshops, dissemination of the potential and the concept to a wider community).

Major Milestones



Status January 2012

BioBoost started 1. January 2012. The Kick-Off meeting was held from 25th - 26th January 2012 in Karlsruhe at the KIT.

Information			
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DG	Research (282873)	**Priority Area**	Renewable energies
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