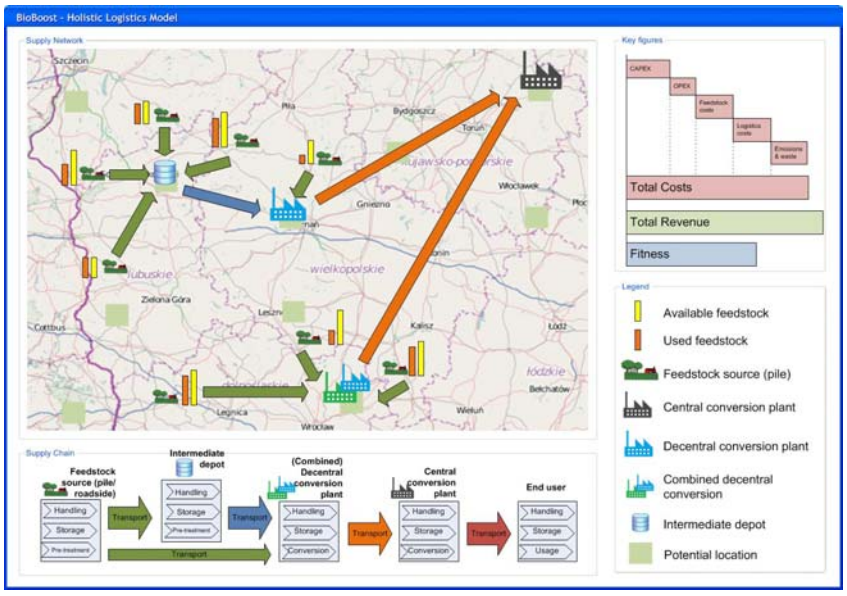
BioBoost – Biomass based energy intermediates boosting biofuel production

The project partners have completed the data generation and data collection phase. The value chain model developed by Fachhochschule Oberösterreich (FHOÖ) will now be used for further analysis and optimization of bioenergy pathways at the level of the EU-28.

"BioBoost" aims at the optimization of value chains converting residual biomass into advanced biofuels and bioenergy. Three promising thermochemical value chains for intermediate energy carrier production to be used for heat, electrical power, and fuels production have been selected in the project. A value chain model has been developed to identify optimal combinations of available feedstock, conversion plant locations and transport ranges.

After 30 months the different solid and liquid energy carriers addressed in the project have been developed and optimized. The value chain model development and data collection have been finished and published on the website (www.bioboost.eu).



To assess the value chain model, a large quantity of carefully selected data along the different bio-energy pathways are now included. The potential of residual biomass in EU 28 and its costs have been evaluated and made available on a Geographic information server (www.). Experiments at three relevant pilot plants for fast pyrolysis, catalytic pyrolysis and hydrothermal carbonisation supplied information on efficiencies, economy of scale, and further technical and economic process parameters. High energy density intermediates are selected and assessed in regard to be utilised via gasification and synthesis to synfuel, upgrading to transportation fuels in refineries or for electricity and heat. Of particular importance is the interaction of feedstock supply, conversion to intermediate energy carriers and final use as illustrated in the figure, considered by life cycle- and techno/economic assessment.

Citation by representative of beneficiaries:

The next step will be using the value chain model to investigate best use of feedstock for biofuels including multi-feedstock chains for year round supply and investigating a ramping up phase during which the intermediate energy carriers are used in existing conversion plants. A slow but continuously increasing market uptake of advanced biofuels will be considered. Other scenarios will investigate the

most cost efficient production scenario for advanced biofuels and those with minimized environmental impact. Final results are expected by June 2015 and will be presented in a workshop in Brussels.

Further information

The BioBoost project concentrates on 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.

Europe is pinning its hopes on energy resources based on residual biomass. BioBoost is one of only two projects for the development of new energy carriers, which were chosen for funding under the 7th EU Research Framework Programme. The project will have a duration of three and a half years and be funded by the EU with a total amount of nearly EUR 5.1 million. Six research institutions and seven industrial partners from all parts of the value chain will participate.

For each Partner – you could insert a citation describing the role or specific task of your organization in the project:

Example from KIT: “Due to its broader access to usable residues and a broader spectrum of use of the energy carriers, this project fits excellently to our bioliq® project in Karlsruhe. Both projects profit from each other in an ideal manner,” explains BioBoost project coordinator Nicolaus Dahmen from the Institute of Catalysis Research and Technology (IKFT) of KIT.

Example 2 from FHOOE: “FHOOE had many years of relevant experience in its competence center for logistics and supply chain management (“Logistikum”) in Steyr and its research group for Heuristic and Evolutionary Computation (HEAL) in Hagenberg to optimize logistics pathways. BioBoost allowed both teams to collaborate more intensively than they had ever done before in order to contribute significantly to the BioBoost project by defining a viable logistics network”, says FH OÖ project coordinator Gerald Schönwetter from Logistikum.

The project will cover the analysis of economic efficiency of the complete process, optimization of logistics chains, and the investigation of environmental compatibility. The objective is to significantly improve the efficiency of the use of biomass and residues in the future.

The process consists of several steps. The first step serves to concentrate the energy, as the residual biomass, e.g., straw, arises in a spatially distributed manner and contains a very small amount of energy. At decentralized facilities, biogenous residues are converted into coke and oil by pyrolysis or carbonization. These products are mixed to form energy-rich intermediate products that contain up to 90% of the energy stored in the biomass. They can be transported in an economically efficient manner to a central location for further processing. There, the energy carriers are subjected to large-scale use in a second step. In addition to the production of customized fuels, such as diesel, gasoline, or kerosene, scientists will also investigate the production of chemicals like methanol, ethylene, and propylene as well as plastics. Generation of electricity and heat from the energy-rich intermediate product also is subject of BioBoost. A logistic model for feedstock supply and connection of de-central with central conversion is set up and validated allowing the determination of costs, the number and location of de-central and central sites. Techno/economic and environmental assessment of the value chain supports the optimisation of products and processes.