BIOMASS BASED ENERGY INTERMEDIATES BOOSTING BIO-FUEL PRODUCTION

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Facts

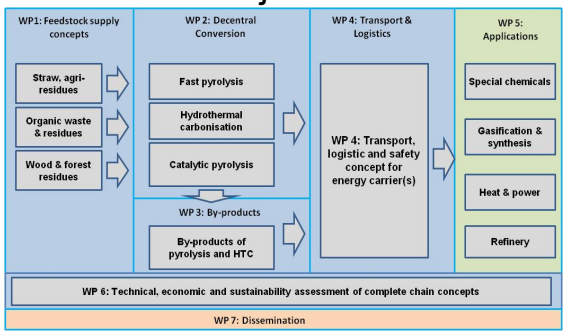
THEME ENERGY.2011.3.7-1: Development of new or improved sustainable bio-energy carriers

Project Reference: 282873 CP in FP7
Coordinator: Karlsruher Institut für Technologie (KIT)

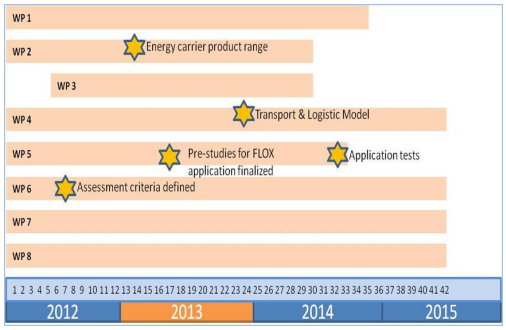
Start: 01/2012
Duration: 42 month
Budget: 7.3 Mio €
Funding: 5.1 Mio €

Beneficiaries: CERTH, AVACO$_2$, CHIMAR, ENBW, TNO, GRACE, IUNG, FHOÖ, NESTE, SYNCOM, DSM, USTUTT

Project structure



Timetable



Objectives

BioBoost paves 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.

The conversion of dry and wet residual biomass and wastes to an intermediate energy carriers like oil, coal or slurry is studied by:

- fast pyrolysis,
- catalytic pyrolysis,
- hydrothermal carbonization

Major activities include the:

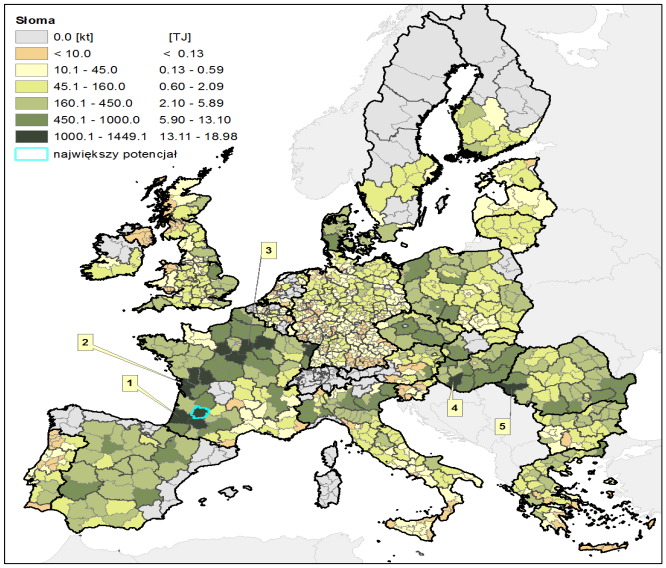
- analysis of the economic efficiency of the complete production pathways,
- the optimization of the logistic chains and the investigation of the environmental compatibility.

Approach

- Investigate feedstock potential, costs and logistic of residual biomass in EU-28 and build-up a GEO-portal to present and display the GIS data
- Identify an optimized energy carrier(s) produced by de-central conversion by fast pyrolysis, catalytic pyrolysis or hydrothermal carbonisation.
- Increase feedstock flexibility of applications by optimised energy carrier(s) and investigate chemical byproducts of conversion.
- Develop a logistic model to identify most suitable plant locations based on supply and demand.
- Perform a technical, economical, environmental and social assessment of the chains, sensitivity and scenario analysis and LCA.
- Investigate and demonstrate energy carrier(s) application in CHP, gasification, refinery and chemistry

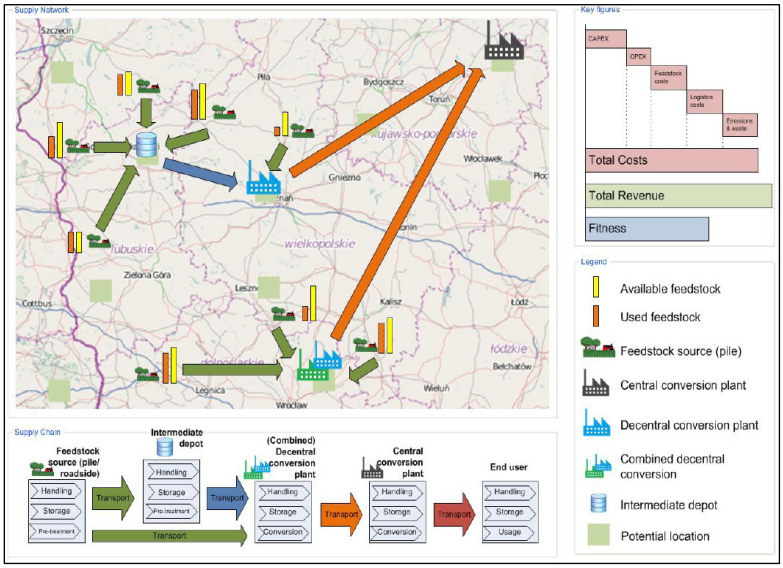
First results: Straw potential

(Institute of Soil Science and Plant Cultivation, PL)



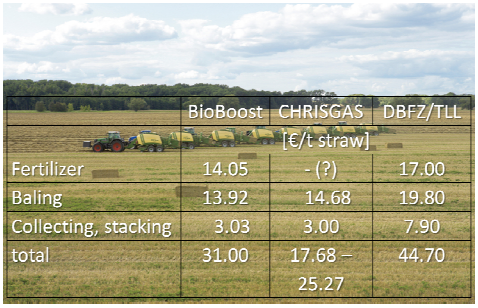
LOGISTIC model

(University of Applied Sciences, Upper Austria, FH OÖ)



Straw cost (SYNCOM)

Calculation:
Baler fix: € 4.2/t
Baler var.: € 5.0/t
Fuel : €1.9/t
Tractor: € 57/h
Labour: € 13/h
Total: € 13.9/t
@ 50 bales/h; i.e. 5t/ha, >10 ha or several in small distance



	BioBoost	CHRISGAS	DBFZ/TLL
	[€/t straw]		
Fertilizer	14.05	- (?)	17.00
Baling	13.92	14.68	19.80
Collecting, stacking	3.03	3.00	7.90
total	31.00	17.68 – 25.27	44.70

CONCLUSION:

The de-centralized pretreatment of residues and wastes into energy carriers increases feedstock flexibility and resource efficiency.

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