

P R E S S R E L E A S E

Graz, March 2018

Wood as feedstock for the chemical industry

BIOENERGY 2020+ successfully completed a research project regarding mixed alcohol synthesis with an international consortium. This is a further step from laboratory towards industry, to use regional available biomass as feedstock for chemical industry and transportation fuel.

BIOENERGY 2020+ operates a lab-scale mixed alcohol unit with real wood gas. Wood gas is converted to a mixture of alcohols, this process is therefore called mixed alcohol synthesis. The produced alcohols are suitable feedstock for chemical industry and transportation fuel. State of the art feedstock for wood gas production is forest wood chips, future feedstock could be any biomass residue or waste. This results in a low carbon footprint and there is no competition between food and fuel.

In the third mixed-alcohol-synthesis project, BIOENERGY 2020+ achieves a long term testing (1020 hours of operation) and a model based control system. The Californian project partner West Biofuels could successfully demonstrate the scale-up, an optimized pilot unit was build and commissioned. Knowledge about the long-term stability and the influence of the larger scale are important research finding to get the mixed-alcohol-synthesis to industrial use.

The project partners of the international consortium were Albemarle Corporation (the Netherlands/USA), REPOTEC GmbH & Co KG, TU Graz, TU Wien, UC San Diego (California, USA) und West Biofuels (California, USA). The project management of the two year project was Matthias Binder from BIOENERGY 2020+. The Project was funded within the Austrian COMET program which is managed by the Austrian Research Promoting Agency (FFG).

There are currently negotiations on a follow up project and there is great international interest to continue.

Matthias Binder: „Our goal is to utilize regional biomass as feedstock for chemicals and fuel. We are proud that, due to the research findings, we are getting closer to achieving this ambitious goal.”

Background and process steps

BIOENERGY 2020+ is working since 2009 on advanced conversion technologies to produced chemicals from wood. In Güssing research and development on synthesis are done, aiming for the production of e.g. diesel, kerosene, methane, hydrogen. National Partners are REPOTEC, an experienced biomass power plant engineering company, TU Wien and TU Graz. In the USA, the condition for alcohol as fuel blend is beneficial and there is strong interest on the cooperation. This

project opens BIOENERGY 2020+ the US-market, which leads to a further internationalization of the research center.

Wood gas is conditioned, compressed and fed into the reactor. A special catalyst, which is developed and provided by the partner Albemarle, is used. This makes the synthesis resistant against sulfur and other catalyst-poisons. Finally the outlet stream is cooled – the alcohols are condensed and can be separated as liquid product.

Foto: Matt Hoffman, West Biofuels

Publications: Binder, M., Weber, G., Rauch, R., Hofbauer, H., 2016, *"Progress in Mixed Alcohol Synthesis - Based on Wood Gas Derived from Dual Fluidized Bed Biomass Steam Gasification"*, poster presentation at CASCATBEL workshop 2016, 18 - 20 May 2016, Porto Carras, Greece.

Binder, M., Rauch, R., Hofbauer, H., 2016, *"Mixed alcohol synthesis based on wood gas derived from dual fluidized bed biomass steam gasification - applying a rapeseed oil methyl ester gas scrubber for gas conditioning"*, poster presentation at BioResTec2016 - 1st International Conference on Bioresource Technology for Bioenergy, Bioproducts & Environmental Sustainability , 23 - 26 October 2016, Sitges, Spain.

Binder, M., Rauch, R., Hofbauer, H., 2016 *"Improving the propanol yield of mixed alcohol synthesis based on wood gas derived from biomass steam gasification"*, presentation at: 5th International Symposium on Gasification and its Applications (ISGA-5), 29.Nov.-01.Dec.2016, Busan, Korea

Binder, M., Rauch, R., Hofbauer, H., 2017, *"Performance of a mixed alcohol synthesis lab-scale process chain operated with wood gas from dual fluidized bed biomass steam gasification"*, poster presentation at CEBC 2017 - Mitteleuropäische Biomassekonferenz , 18 - 20 January 2017, Graz, Austria.

Binder, M., Rauch, R., Koch, M., Summers, M., Aichernig, C., and Hofbauer, H., 2017, *"Influence of sulfur components on the catalytic mixed alcohol synthesis based on wood gas derived from biomass steam"*, in: Proceedings of the 25th European Biomass Conference and Exhibition, 12 - 15 June 2017, Stockholm, Sweden

Summers, M., Liao, C., Hoffman, M., Hart, M., Seiser, R., Cattolica, R., Niemann, U., Binder, M., Rauch, R., 2017, *"Production of Fuel Ethanol and Higher Alcohols from Biomass Residue"*, in: Proceedings of the 25th European Biomass Conference and Exhibition, 12 - 15 June 2017, Stockholm, Sweden

Contact: DI Matthias Binder, Junior Researcher, Tel: 03322/42606-155, matthias.binder@bioenergy2020.eu,

Mag. Claudia Peternell, PR, Tel. 0316/873-9207, claudia.peternell@bioenergy2020.eu., Inffeldgasse 21 b 8010 Graz, www.bioenergy2020.eu.