



Deliverable 2.15

Report on optimal conceptual process design in terms of energy and material efficiency for all products

Demonstration of solvent and resin production from lignocellulosic biomass via the platform chemical levulinic acid

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About GreenSolRes

The need to establish economic and sustainable large-scale operations for the conversion of renewable resources to chemical building blocks is becoming increasingly urgent in the context of climate change and depleting fossil fuel reservoirs. Pathways for manufacturing of bio-based fuels and chemicals have been developed but often rely on sugar and starch crops for feedstock. The European Demonstration project - GreenSolRes aims at a sustainable and competitive industrial production of the platform chemical levulinic acid (LVA) from non-food lignocellulosic biomass. Further, the conversion of LVA and LVA esters into industry relevant building blocks γ -valerolactone (GVL), 1-methyl-1,4-butanediol (MeBDO) and 2-methyltetrahydrofuran (2-MTHF) will take place by new catalytic methods developed during the course of this project. Finally, these chemicals will be upgraded to solvents and resin monomers to produce high added value adhesives and consumer products.

Project Coordinator



Project Office



Consortium



About this document

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Publishable Summary

Conceptual process designs for both, the hydrogenation of LVA to GVL and MeBDO and the cyclization of MeBDO to 2-MTHF were developed. The content of high-boiling impurities in the LVA feed, as well as the permissible number for the reuses of the ruthenium based catalyst are crucial boundary conditions for the hydrogenation of LVA to GVL and MeBDO. For every number of reuses a permissible concentration of high-boiling impurities can be estimated. The catalyst concentration in interaction with the reactor dimensions is key for the economics of the whole process. For every boundary condition, a cost-optimal catalyst concentration can be identified and production costs for MeBDO can be estimated in terms of operating and investment costs.