



Deliverable 2.21

**Report on Techno-Economic Feasibility of
Heterogeneous Catalysed Commercial
Production of GVL from Levulinic Acid or
Levulinic Ester**

**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

Gamma-valerolactone (GVL) is an excellent and versatile solvent, which has been discussed in numerous publications and named as a potential alternative to the reprotoxic NMP. The possibility to manufacture GVL based on sustainable raw materials is a further benefit. However, it has never been produced on a large industrial scale.

Here a successful heterogeneous gas-phase hydrogenation of ethyl levulinate to GVL has been shown in a continuous mode. Various parameters such as temperature and catalyst load were optimized to improve the overall selectivity of GVL before scale-up. The heterogeneous gas-phase process was then successfully transferred from small scale to kg-scale. Further up-scale of the developed process to industrial assets is possible.

