

Modern Biorefineries

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Abstract:

Biofuels, chemicals, and materials derived from lignocellulosic biomass have been the focus of the international R&D community and technology developers for the last decades. However, despite intense efforts, a real breakthrough has not been achieved yet. This has been mainly due to a biased view, focusing solely on a certain end product—for example, cellulose pulp or ethanol—and considering by-products as low-value waste streams for energy applications. With the new wave of lignocellulosic biomass fractionation technologies being demonstrated at a pilot scale, success stories are closer than they have ever been. Biomass fractionation to high purity intermediate building blocks of cellulose to C6 sugars and hemicellulose to C5/C6 sugars and lignin, instead of just one main product, provides a way to produce a diversity of products and establish novel bio-based value chains. Especially important is the availability of higher purity lignin for different direct drop-in or after processing (depolymerization etc.) applications, which—compared to the conventional lignins derived from pulp mills or ethanol refineries—provides totally new applications and perspectives to enable the increased use of biobased raw materials in various industries. Technological advancements in the field are to be demonstrated at European Commission co-funded H2020/BBI JU Flagship project SWEETWOODS (Grant Number: 792061). The project is a large, 43 M€ joint pilot project, that aims at establishing a completely unique wood fractionation Flagship plant in Estonia and demonstration of novel value-chains based on sustainable hardwood resource. During the project MetGen completes an industrial demonstration of its four novel biorefinery solutions: Tailored hydrolysis solution, Enzymatic lignin depolymerization, Lignocellulosic glucose isomerization, and Glucose conversion to glucosone.

Biography:

Alex Michine is a founder and CEO of MetGen since 2008. As a serial entrepreneur, Alex has over 25 years of international experience in biotechnology and cleantech industries. MetGen's mission is to empower industries to get more value out of lignocellulosic biomass.