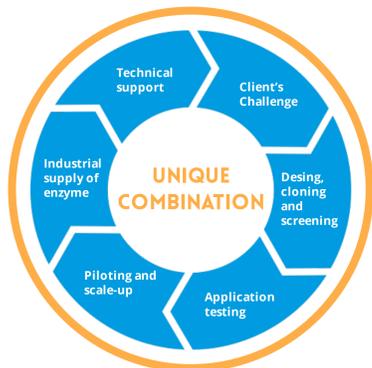


# ONE SIZE DOES NOT FIT ALL

## METGEN TAILORS SOLUTIONS TO ALL THE CHALLENGES ALONG THE BIORENEWABLE VALUE-CHAIN

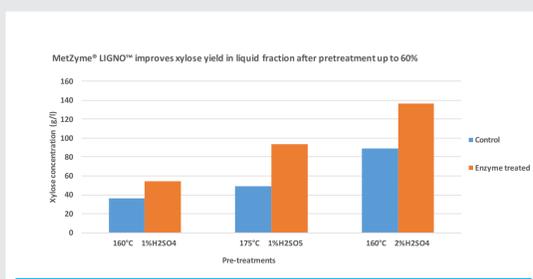
Antoine Mialon, Matti Heikkilä, MetGen Oy



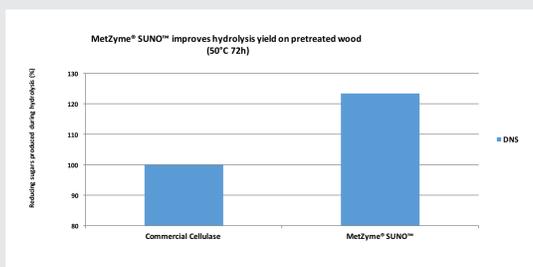
|                       | METGEN | Incumbent companies | Enzyme Resellers | Research | Tollers |
|-----------------------|--------|---------------------|------------------|----------|---------|
| Tailored Solutions    | ✓      | ✗                   | ✓                | ✓        | ✗       |
| Protein Engineering   | ✓      | ✓                   | ✗                | ✓        | ✗       |
| Process Development   | ✓      | ✓                   | ✗                | ✓        | ✓       |
| Industrial Production | ✓      | ✓                   | ✗                | ✗        | ✓       |

**ENZINE®** Technology platform enables creation of disruptive enzymatic solutions for industrial applications – ENZINE® IS:

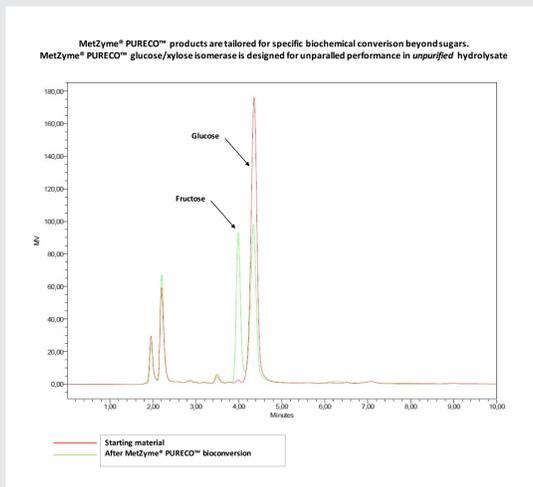
- **FAST:** Industry leading short development cycle
- **FLEXIBLE:** Tailored enzyme design approach to meet challenging industrial conditions
- **ADAPTABLE:** Can produce large amounts of different enzymes, cost-effectively and supply globally
- **PROVEN:** Developed several novel enzymes with IPR from concept to customer validation at industrial scale



**MetZyme® LIGNO™** is designed for delignification of woody substrates. LIGNO™ has its original application in pulp & paper industry where it saves refining energy and improves fibre properties. Same functionality allows improved fractionation of biomass in any biorefining process using lignocellulosic feedstock.



**MetZyme® SUNO™** is designed for wood-based sugar platforms. It allows for more thorough hydrolysis of recalcitrant biomasses. Tailored solution for specific substrate and process enables more complete separation of fractions and also addressing certain chemical compounds with down-stream operations in mind: For example inhibitors can be oxidized during hydrolysis.



**MetZyme® PURECO™** product family addresses the specific conversions towards value-added chemicals beyond sugars. These novel enzymes enable Wood-to-Chemicals value-chain and with that the renewable chemical building-blocks for better products and materials. Opportunities include, but are not limited, to bioplastics, sorbitol, xylitol, furfural, 5-HMF, and organic acids. New technologies supporting Biofuels – such as jet fuel, biogas, or even lignin-based marine diesel – are made available to the industry.

### EXAMPLE CASE: H<sub>2</sub>O<sub>2</sub> PROJECT RETAPP – ENABLING THE VALUE-CHAIN FORM WOOD TO PLASTIC PACKAGING



**MetZyme® LIGNO™** is used for better separation of hemicellulases in pretreatment stage. Resulting soluble fraction has most of the xylose for further conversion to value added chemicals.

**MetZyme® SUNO™** provides higher hydrolysis yields, increased dry-matter content and more affordable production of glucose.

**MetZyme® PURECO™** is used to convert glucose to fructose. Fructose is chemically converted first to 5-HMF, then to FDCA, and ultimately to PEF resin. Xylose is converted to Xylulose, but it can also be further converted to xylitol or furfural.

#### CONTACT US

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