

ENZYMATIC SOLUTIONS FOR INDUSTRIAL BIOREFINERIES

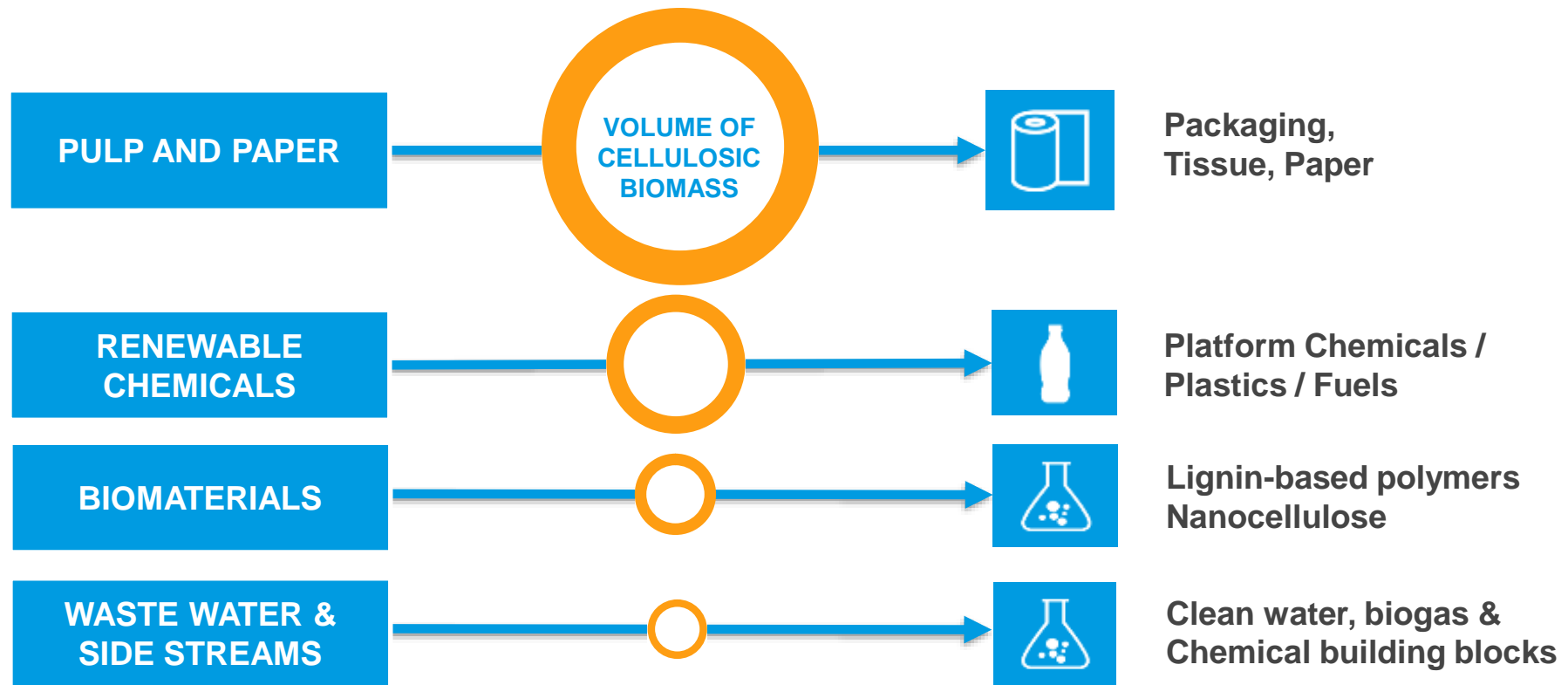
Pitch Perfect 2018 Brussels
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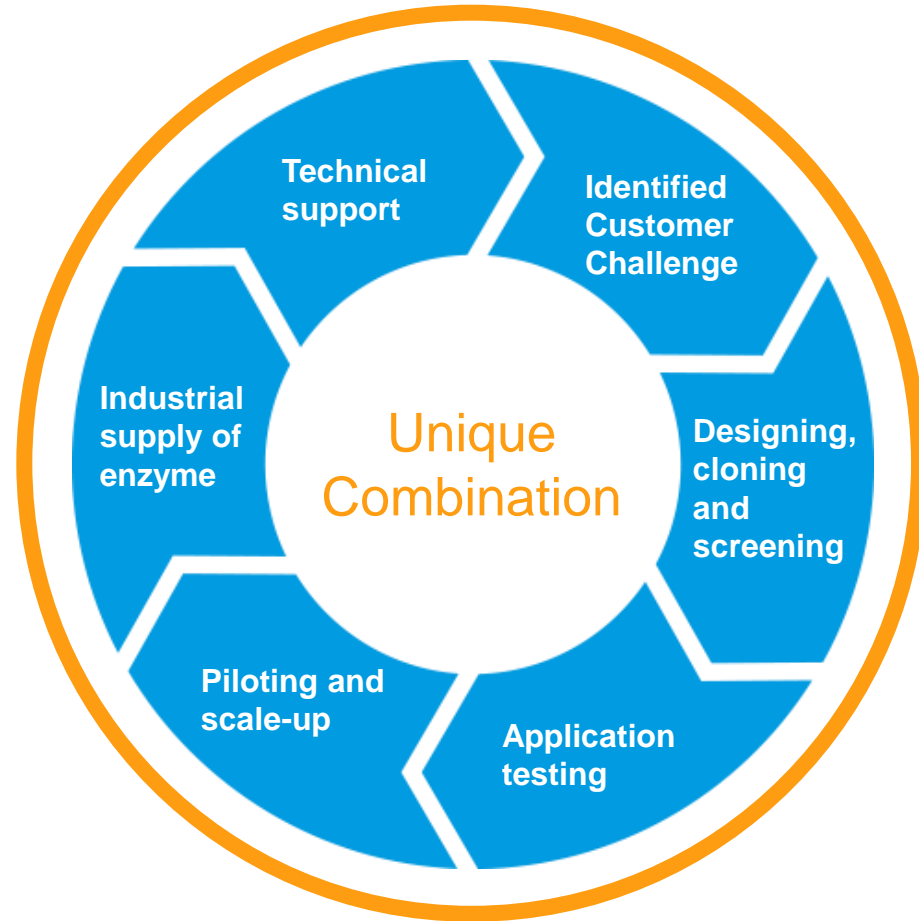
METGEN'S "WHY"

MISSION: EMPOWER INDUSTRIES TO GET MOST OUT OF BIOMASS



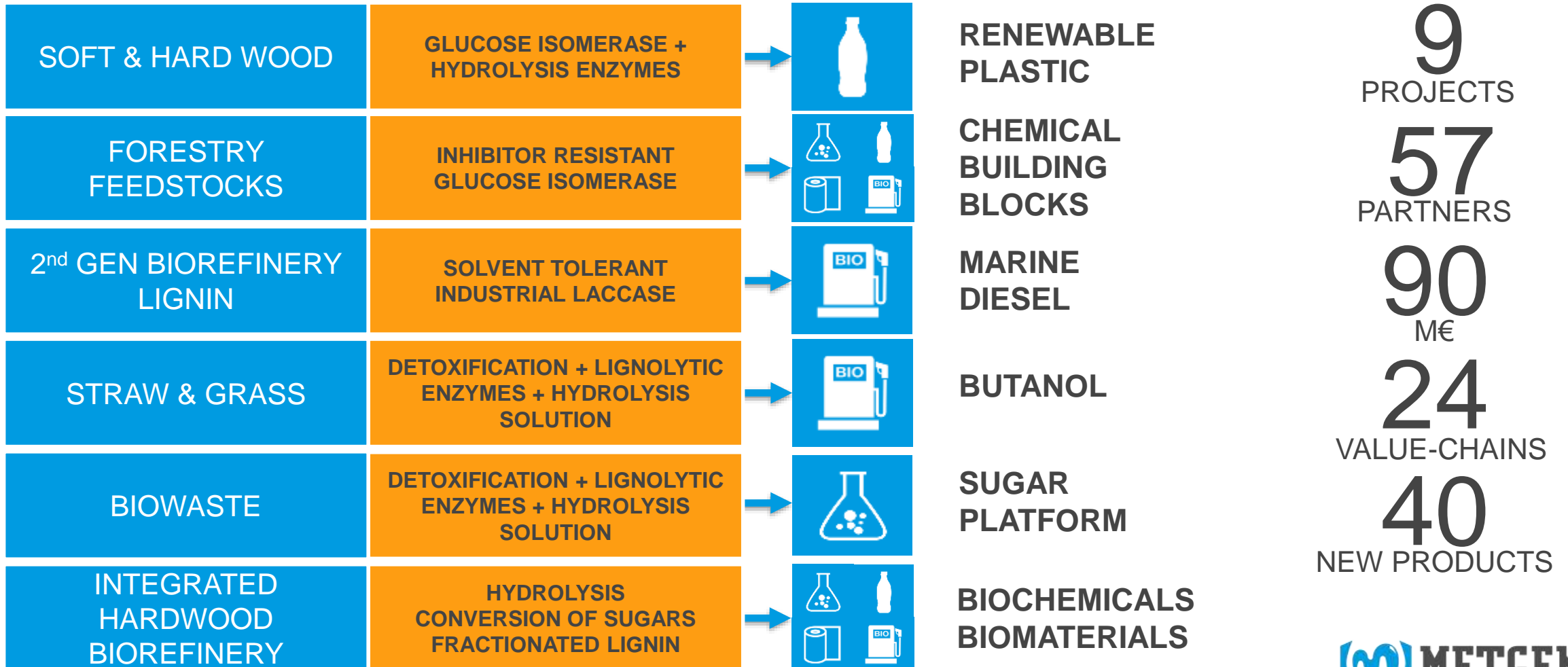
METGEN'S "WHAT" ENGINE® TECHNOLOGY PLATFORM

- **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 from concept to validation at industrial scale and production



METGEN'S "HOW"

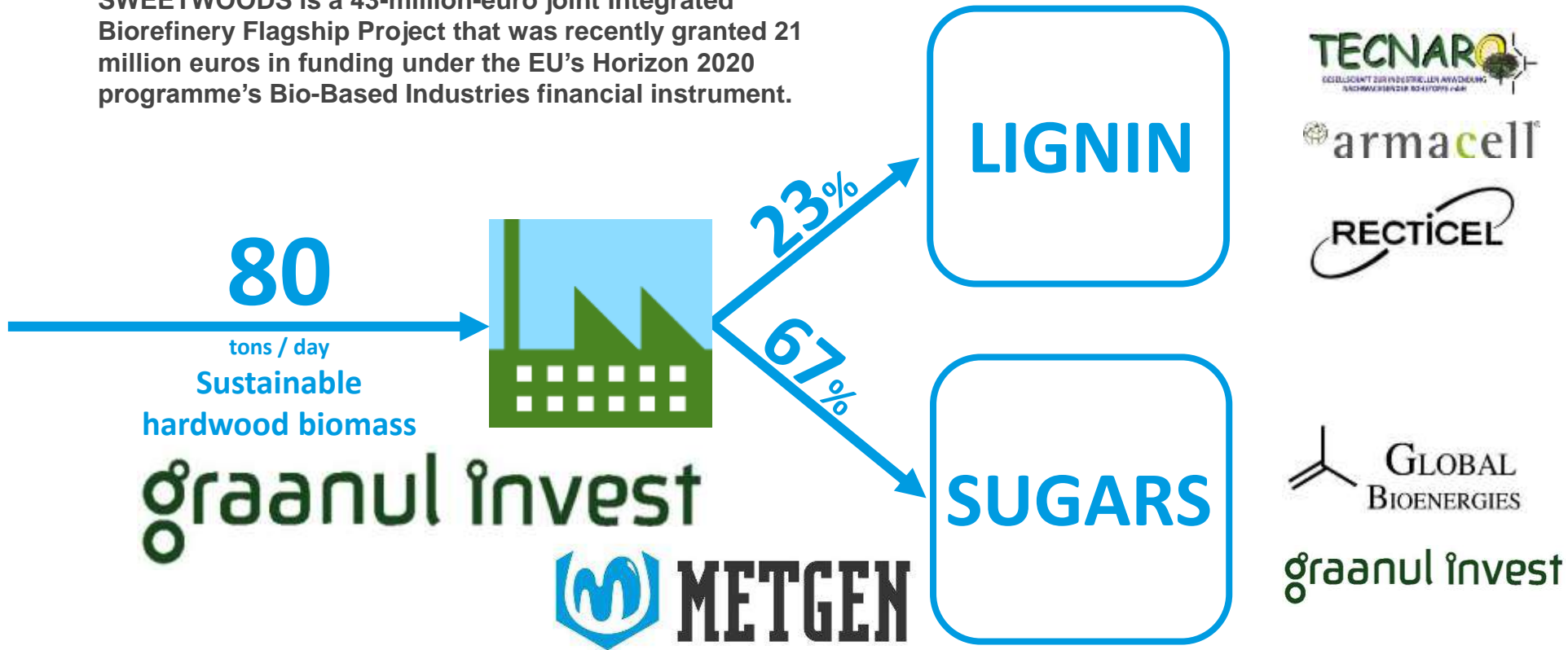
IDENTIFYING FULL VALUE-CHAINS & OPEN INNOVATION



SWEETWOODS PROJECT



SWEETWOODS is a 43-million-euro joint Integrated Biorefinery Flagship Project that was recently granted 21 million euros in funding under the EU's Horizon 2020 programme's Bio-Based Industries financial instrument.



LSCA: 2B S.p.A
Technology viability: Vertech
Project management: Spinverse

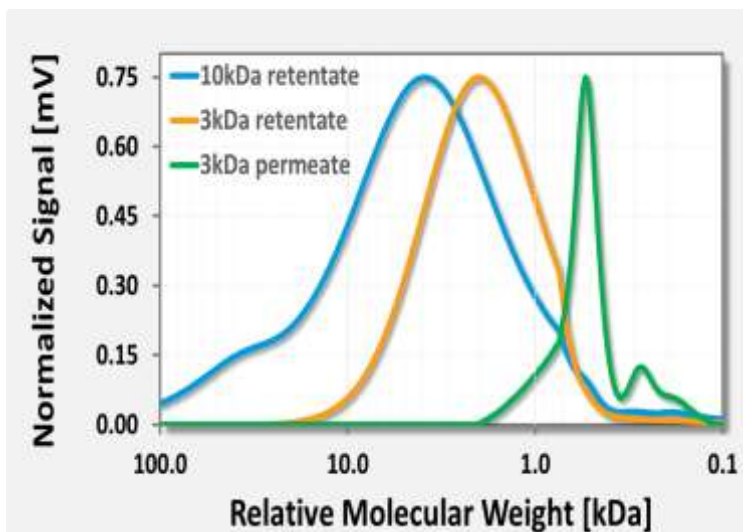


LIGNIN VALORIZATION

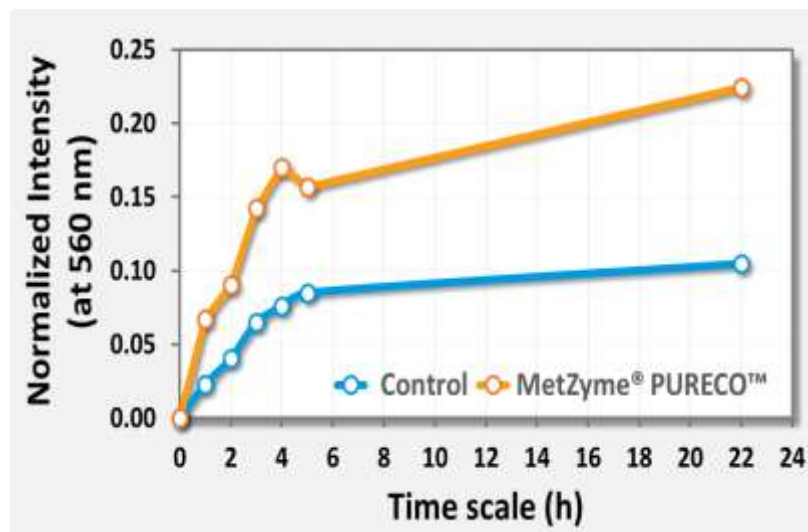
METZYME® PURECO™ is a lignolytic enzyme solution with optimal performance in **high pH (~11)**

PURECO™ enables more efficient and more specific oxidation of lignin, generating highly active lignin fractions and leading to fractionation, demethylation and functionalization.

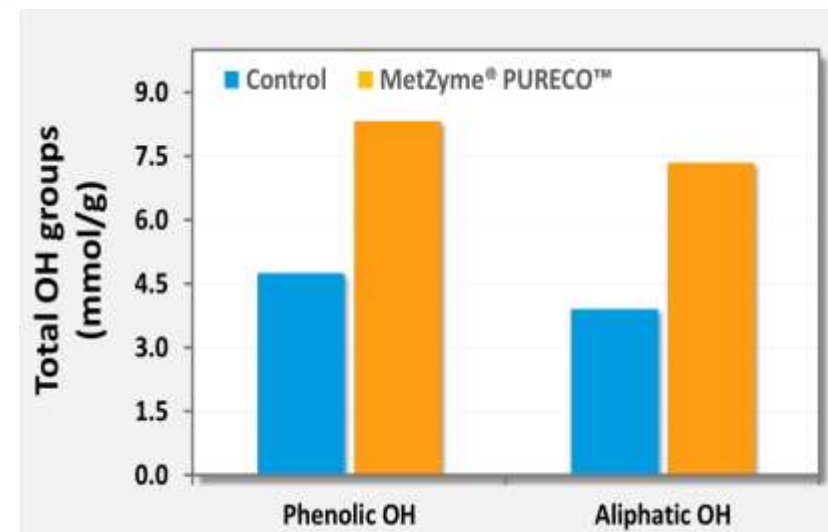
FRACTIONATION



DEMETHYLATION




ACTIVATION



Analysis provided by Prof. N. Labbé et al. Department of Forestry, University of Tennessee, USA.

LIGNIN DEPOLYMERIZATION ADDS VALUE

 METGEN	Molecular Weight	Activity	Solubility in Water / Solvent	Application	Bio-Equivalent of	Price
Industrially available lignin	5–100 kDa	-	-	Burning	Oil / Electricity	50 - 100 €/ton
Enzyme activated lignin	3–50 kDa	++	++	Resins & Adhesives	Form-aldehyde	400 – 500 €/ton
Enzyme depolymerized lignin	0,3–2 kDa	+++	+++	Foams & Composites	PVA	1000 – 1500 €/ton
Enzyme depolymerized specific fractions	0,3 kDa 0,5 kDa 0,7 kDa ... 2 kDa	+++	+++	New materials	Specialty Chemicals & Polymers	> 2000 €/ton

ACKNOWLEDGMENT OF PUBLIC EU H2020 FUNDING



SWEETWOODS



Horizon 2020
European Union Funding
for Research & Innovation

FALCON (720918), SWEETWOODS (792061), WoodZymes (792070), UNRAVEL (792004), BIOrescue (720708) and BIOFOREVER (720710) have received funding from the Bio Based Industries Joint Undertaking / European Union's Horizon 2020 research and innovation programme.



SUPERBIO



- SuperBIO is a HORIZON2020 innovation project that aims to develop new, innovative, cross-border and cross-sectorial industrial value chains in the bio-based economy.
- The SuperBIO project will support the development of value chains producing **bio-based materials, chemicals, fermentation products, innovative food/feed ingredients and liquid or gaseous fuels.**
- MetGen has successfully applied for Market Research innovation service related to Biogas sector.

CONCLUSIONS

METGEN COMBINES SYNTHETIC BIOLOGY AND CHEMISTRY TO ENABLE INTEGRATED BIOPROCESSING:

- Technology platform allows for rapid development of industrial solutions to specific needs
- Enzymes are manufactured and supplied in industrial scale
- Ready to license bioprocessing technologies built around the synthetic biology innovations

CALL FOR ACTION:

- Join us in changing the future of bio-refining by **making lignin a main process stream**
- MetGen is actively looking for new partners to accelerate the development and diversify the field of lignin-based products and applications
- MetGen is open for utilizing the tech platform for joint development of new revolutionary enzymes.

**BIO-BASED INDUSTRY REVOLUTION
REQUIRES ONLY ONE MORE THING:
COLLABORATION!**

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