





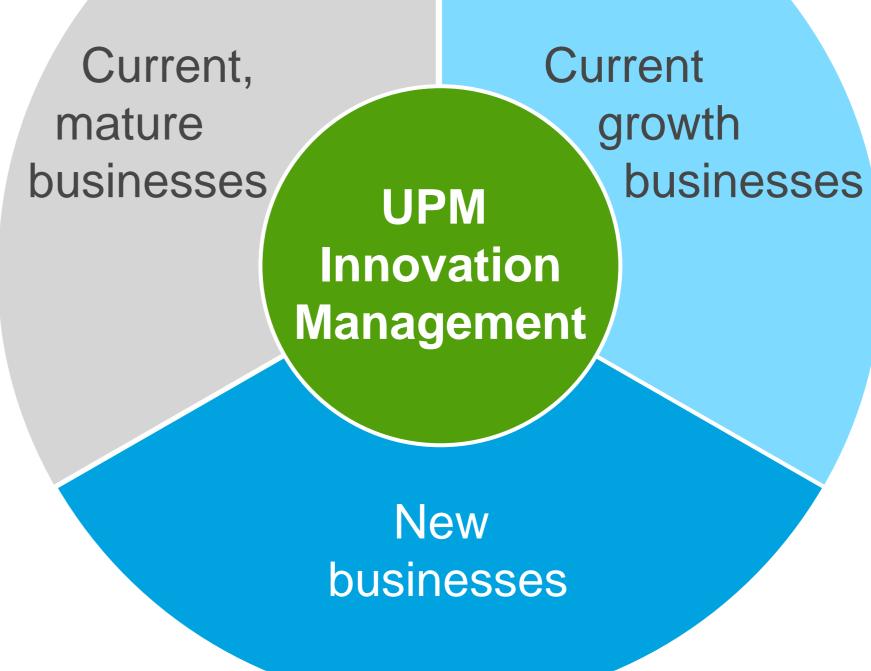
COMPETITIVE ADVANTAGE AND GROWTH THROUGH INNOVATION

Jyrki Ovaska EVP, Technology

What do we mean by innovations at UPM?

- Target: to find & develop new business opportunities and enhance existing businesses
- Innovation is an idea that translates into business value for UPM
 - Business model
 - Service concept
 - Product / product enhancement
 - Business
 - Technology & process
 - New way of operating





Innovation needs differ, but it is a must in all UPM businesses



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Cost savings New services New business models

> New products Go-to-market concept Cost savings

New technologies **Application development** Commercialisation

Product innovations in new and existing businesses













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Digital innovations offer a new opportunity to transform existing businesses



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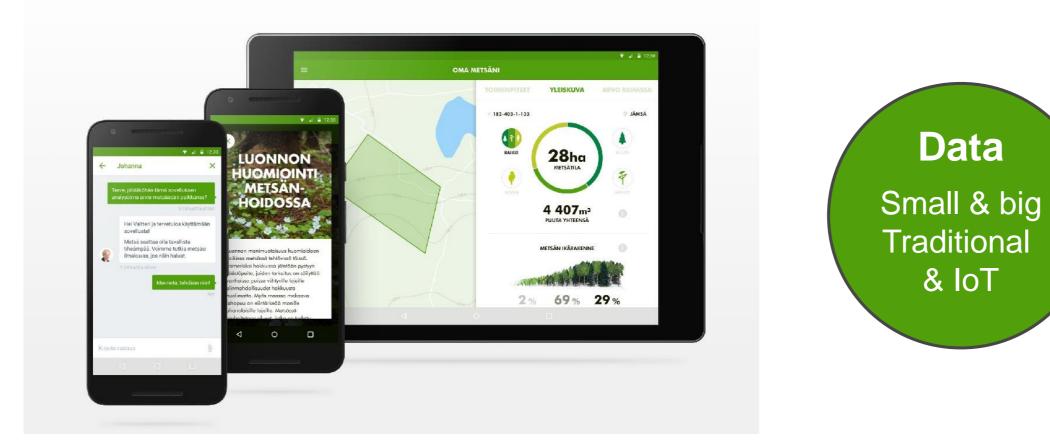
Cost savings New services New business models

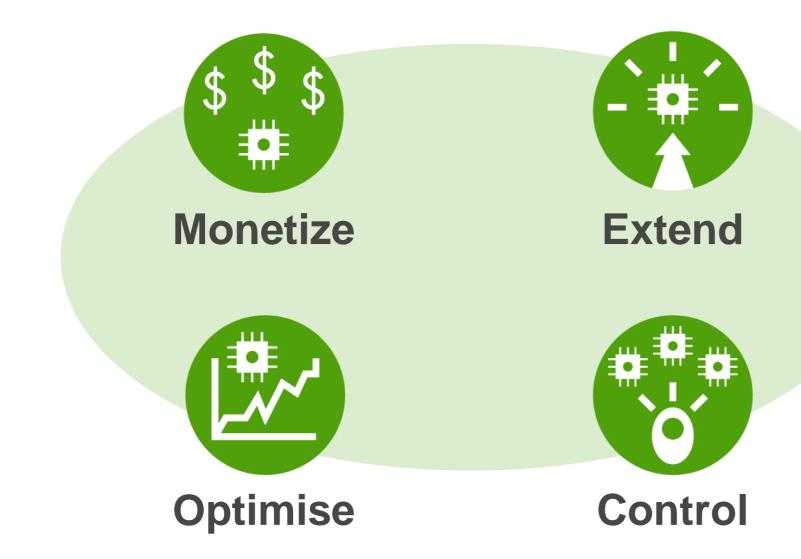
Digital opportunities

New products Go-to-market concept Cost savings

Digital opportunities

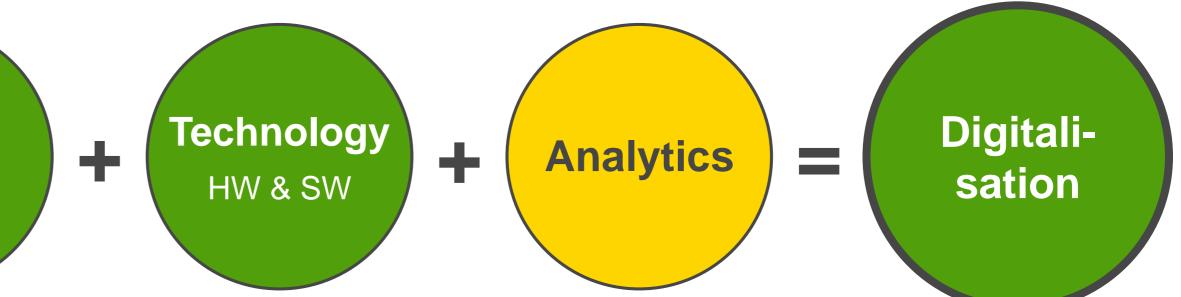
New products New technologies Application development Commercialisation





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Digitalization and IoT Why to be interested?

- New competitive advantage that is hard to copy
- Better customer / user satisfaction with lower costs to serve
- Disrupt industry practices and our own ways of working
- Next steps in cost competitiveness
- Frontrunners will define the rules of the game





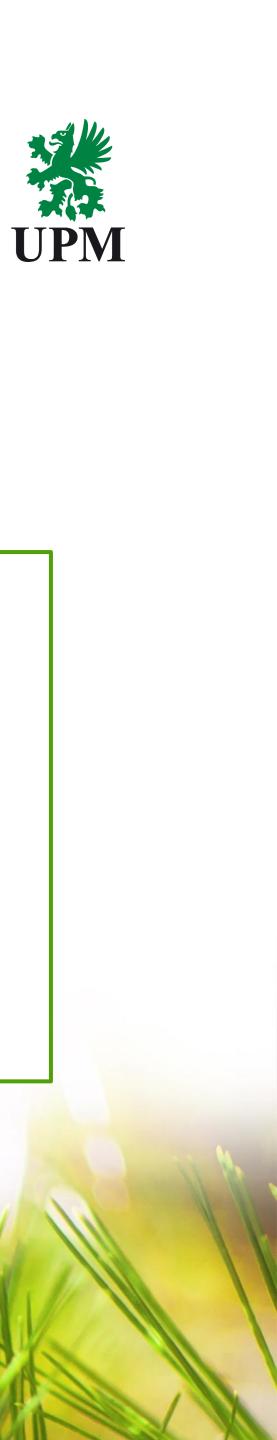


Our planet has to provide increasingly more wellbeing to more people



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MORE WITH BIOFORE

SUSTAINABLE BIOALTERNATIVES & NEW BIOINNOVATIONS

Consumer brand owners continue to drive renewables and green initiatives





Bioplastic Feedstock Alliance The Coal Cita Lempany OF Ford Serie Prog - 10 Ford





WWF FREUNDUCHERE VERMICKUNG



Wood is a unique and excellent raw material for mitigation of global challenges

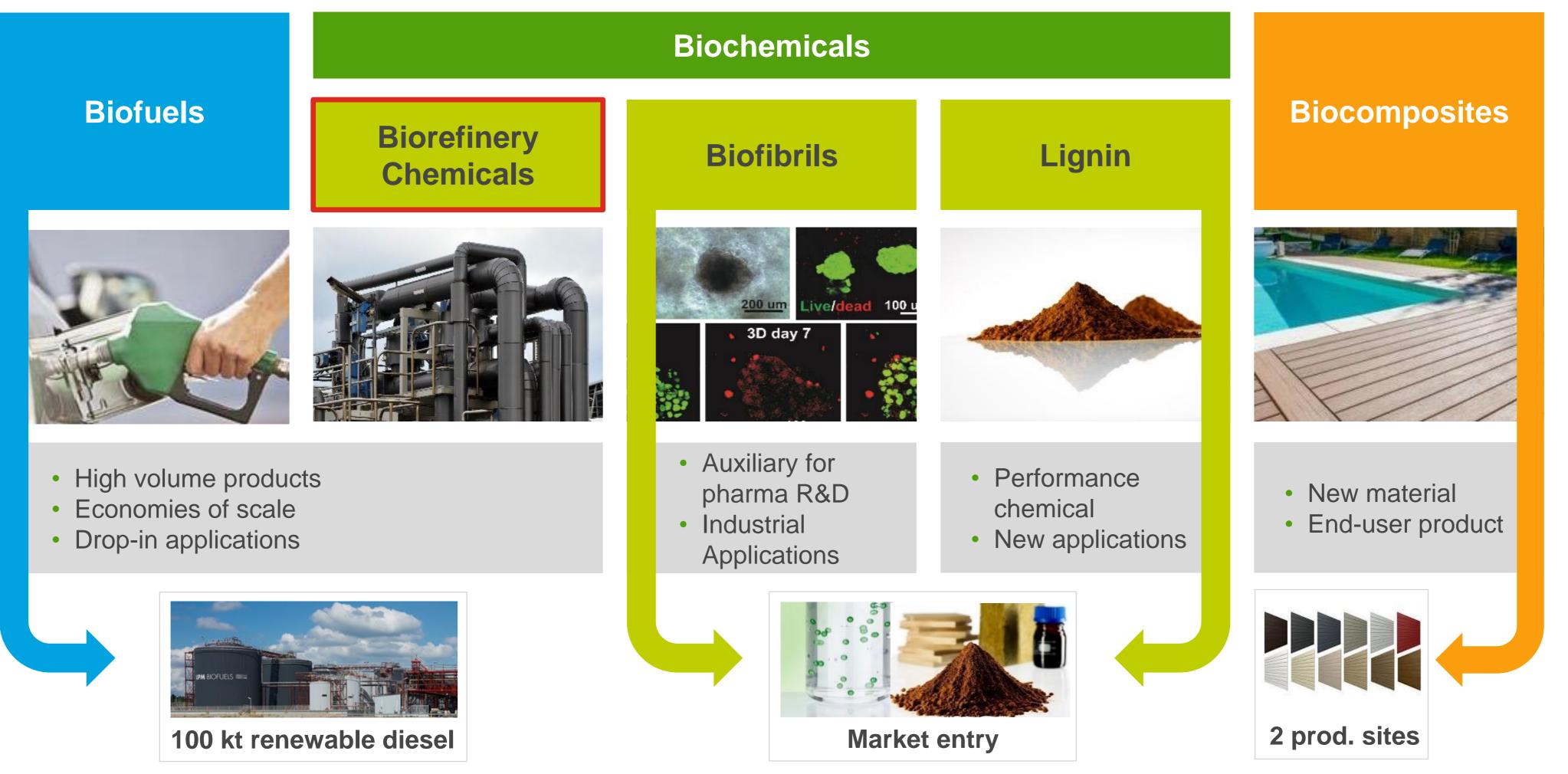


RENEWABLESUSTAINABLENON-FOODRECYCLABLENON-GMOCOMPETITIVEVERSATILELOW MARKET VOLATILITY

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New business opportunities for UPM

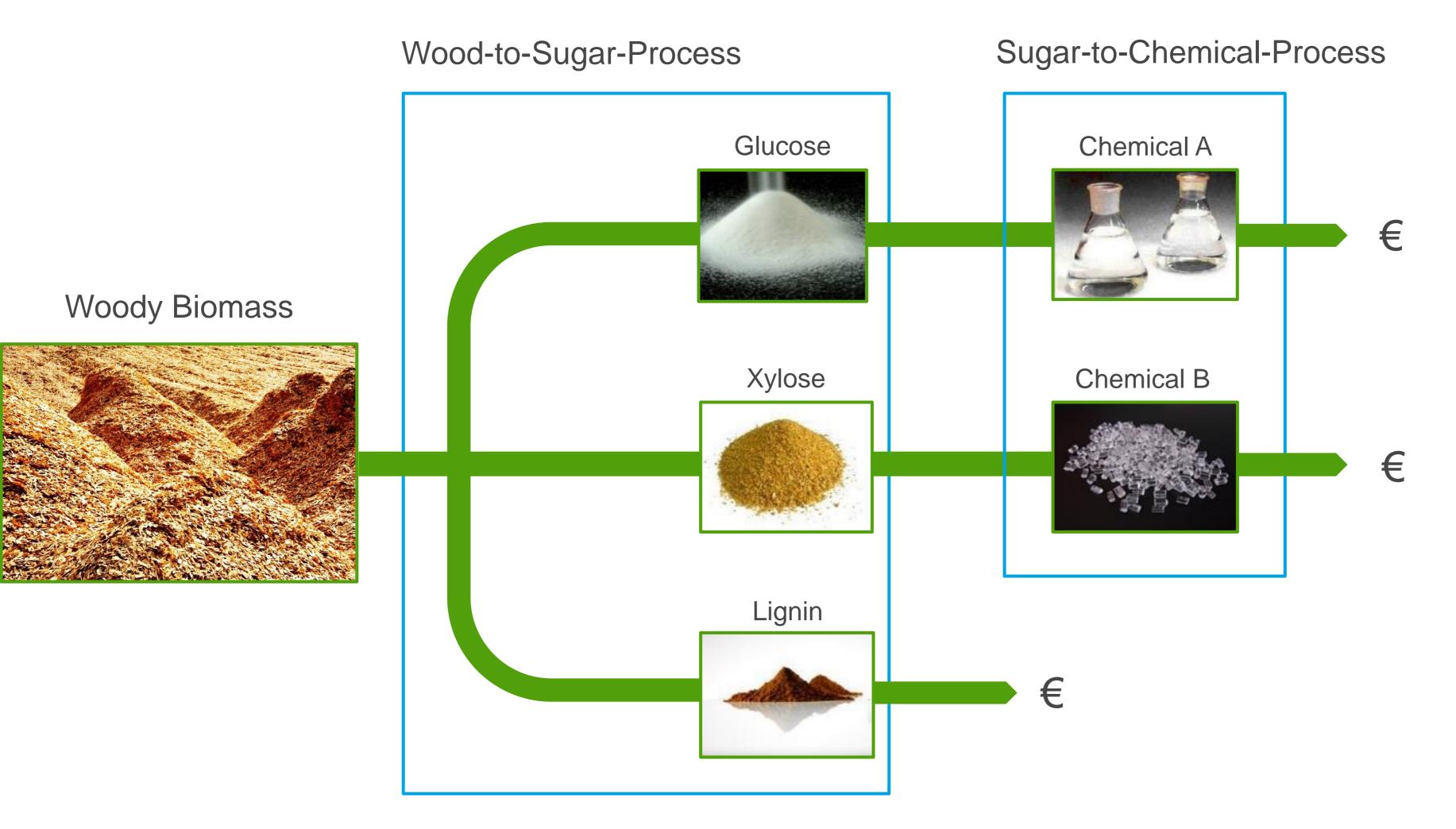


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New separation technologies ensure best overall value capture

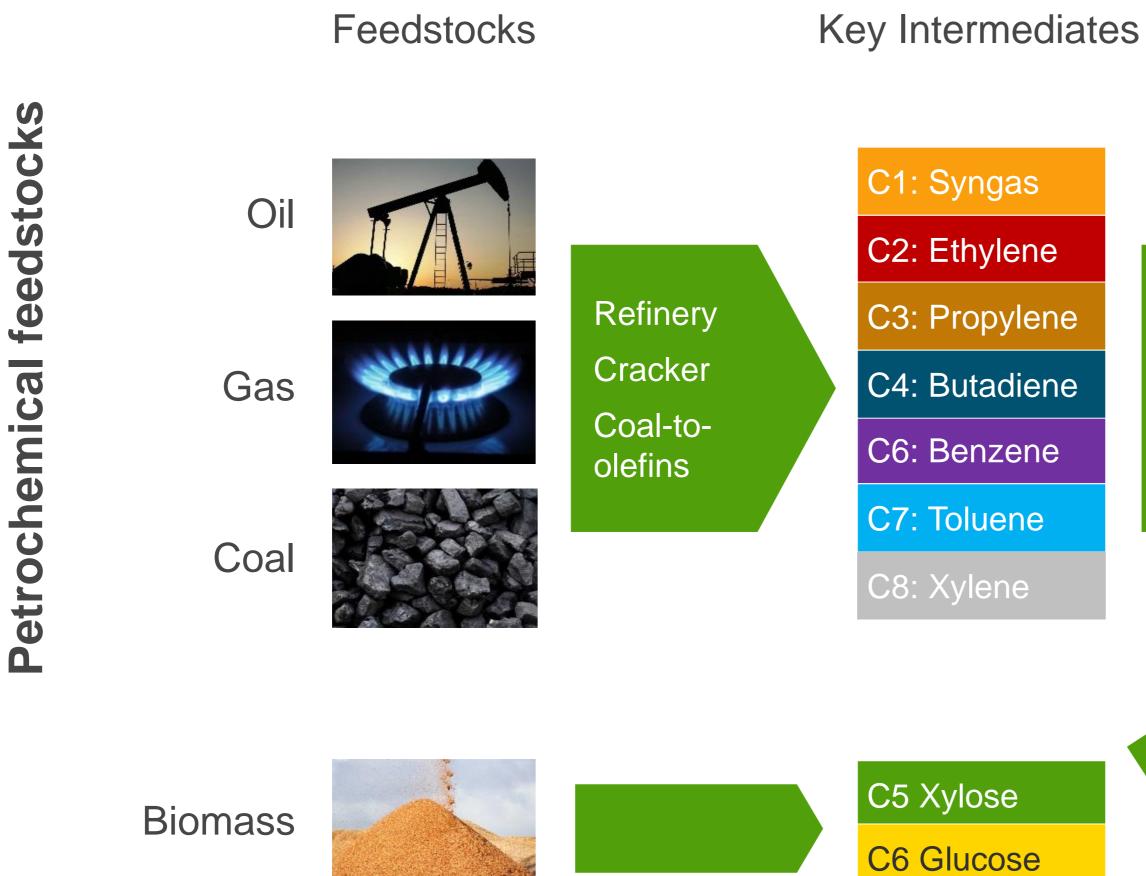


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Partial overlap with fossil-based value chains in chemicals



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Chemical Building Blocks 600 Mtons 10 Mtons

Final products











Diversified chemicals markets offer many opportunities

PLASTICS

FOOD









ADHESIVES



FIBERS



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COSMETICS

PAINTS

COATINGS





TYPICAL APPLICATIONS FOR BIOCHEMICALS



AGRICULTURE



INDUSTRIES



MANY OTHERS

Why UPM and biochemicals ?

Biomass conversion Access to and management of 2G-biomass processes Chemical **Biomass** processes handling - Debarking - Biodiesel - Saw mills - Mechanical UPM pulping **Bioenergy &** Infrastructure - Biomass boilers - CHP - Water treatment

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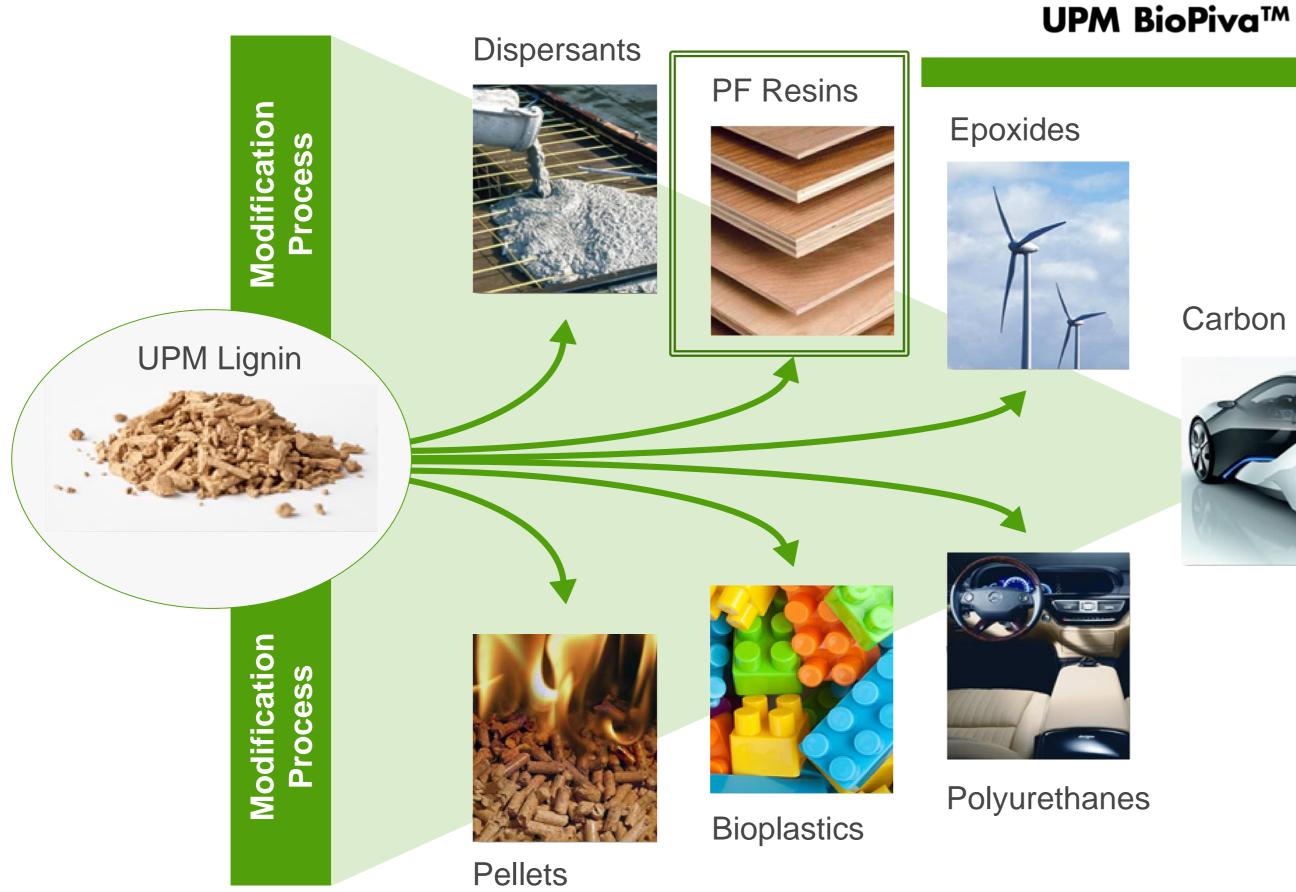


- Kraft pulping
- production

Run sustainably large industrial processes



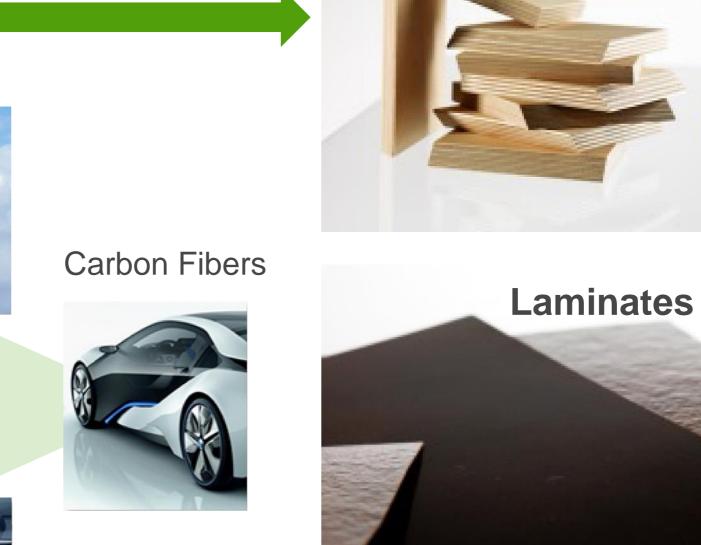
REALITY: phenol in resins replaced by renewable UPM biochemicals



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Plywood

REALITY: UPM biomedicals enabling development of new medical treatments

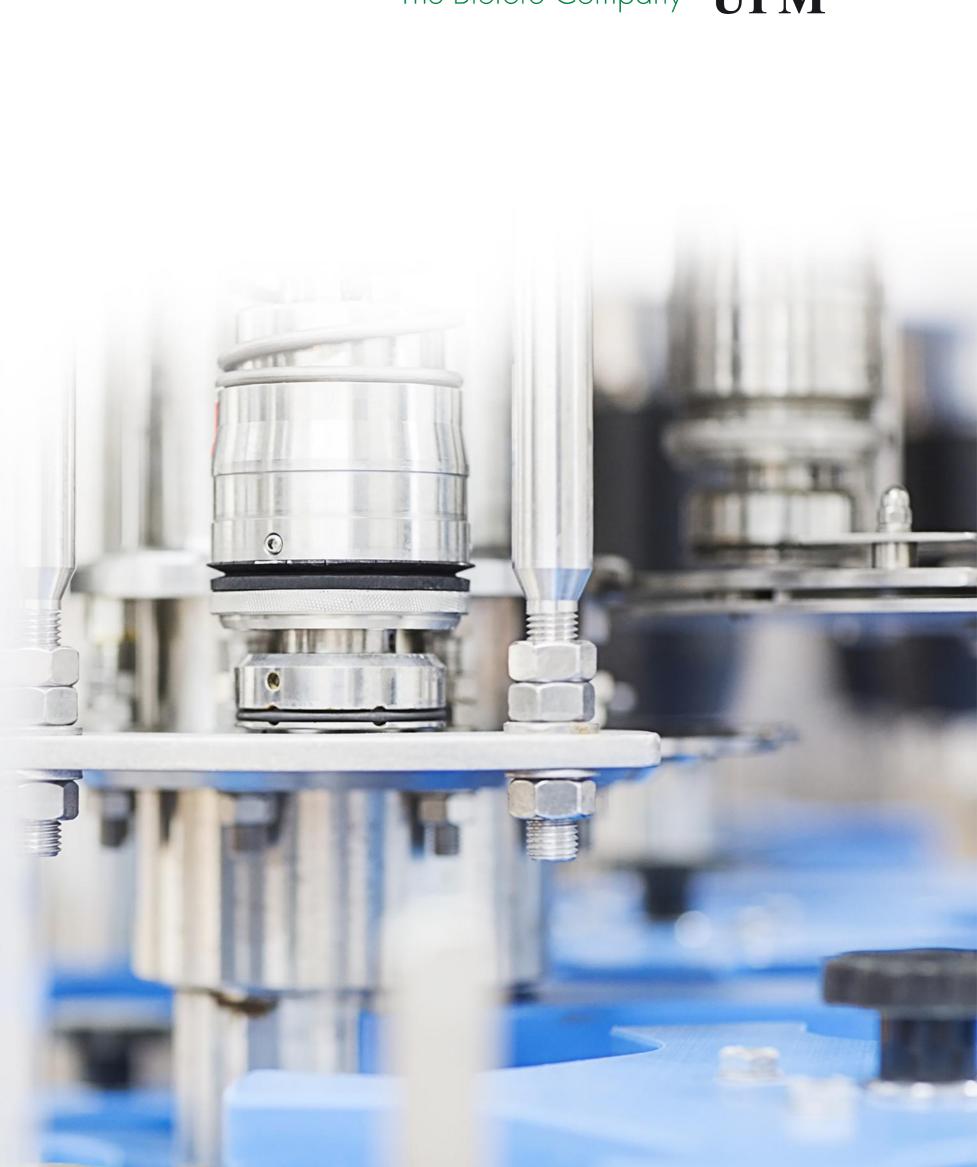




Summary

- Innovations accelerate transformation, drive competitive advantage, top-line growth and new business opportunities
- UPM is in unique position to provide mitigating solutions for global challenges
- Biochemicals provide large market potential. UPM is in good position to capture value through focused growth investments
- Major studies for novel technologies have been going on for 5 years





Redefining the industry



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