From Concept to Reality: The Start-up of UPM's Biorefinery in Leuna

Dr. Konrad Gebauer, IBC2025

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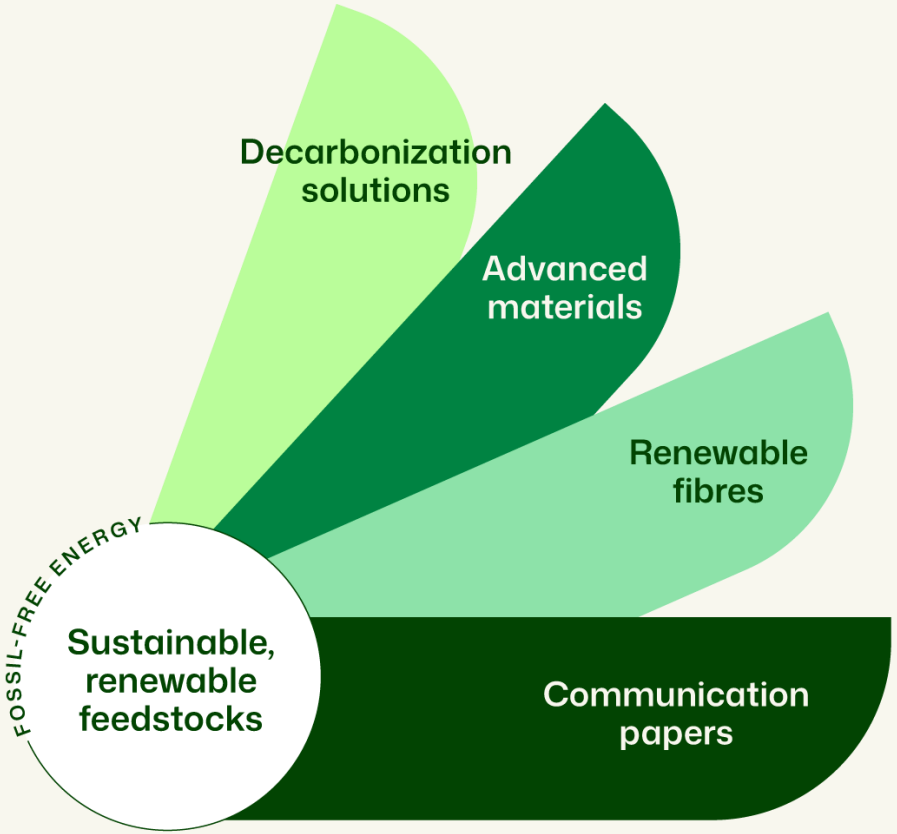
We are a material solutions company

We contribute to the sustainable transformation of society with material solutions, utilizing sustainable, renewable feedstocks.

We create long-term value through our extensive portfolio of renewable fibres, advanced materials, decarbonization solutions, and communication papers.

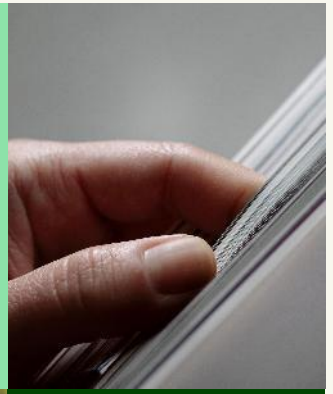


Our businesses

UPM Raflatac

UPM Plywood

UPM Biorefining



UPM Fibres

UPM Specialty Papers

UPM Energy

UPM Communication Papers

UPM Biorefining

UPM Biorefining is **leading the transition to renewable solutions,** addressing the urgent need to reduce emissions.

We pave the way for a sustainable future with biofuels and biochemicals that lower CO_2 footprints and use sustainable raw materials.

UPM Biorefining consists of UPM Biochemicals and UPM Biofuels businesses.

Personnel on Dec 31

468

Lappeenranta biorefinery in operation s. 2015

130k

Annual capacity in tonnes

Leuna biorefinery Full capacity exp. 2027

220k

Annual capacity in tonnes

Pioneering sustainable chemistry, transforming industries.

UPM Leuna biorefinery

> 1,200 million €
Investment

Production volume:
220,000 T
per year

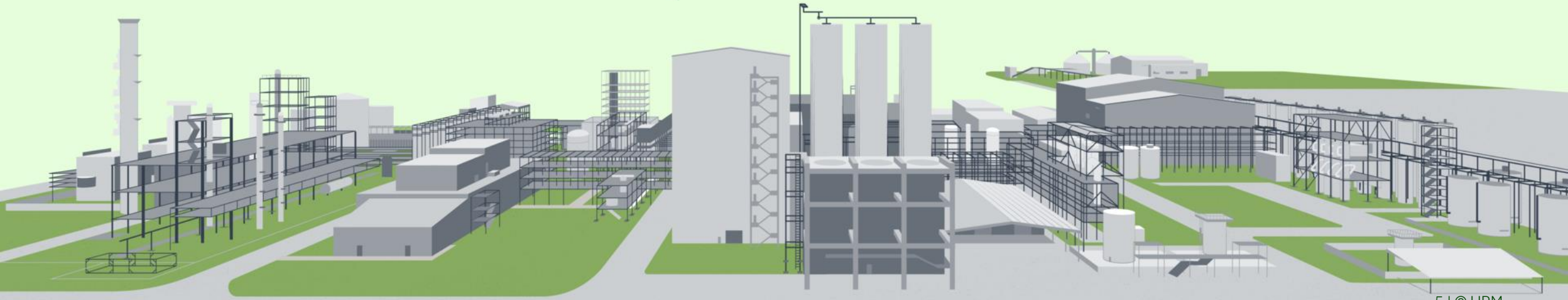
> 100
Employees
at the Leuna site

Start of construction:
January
2021

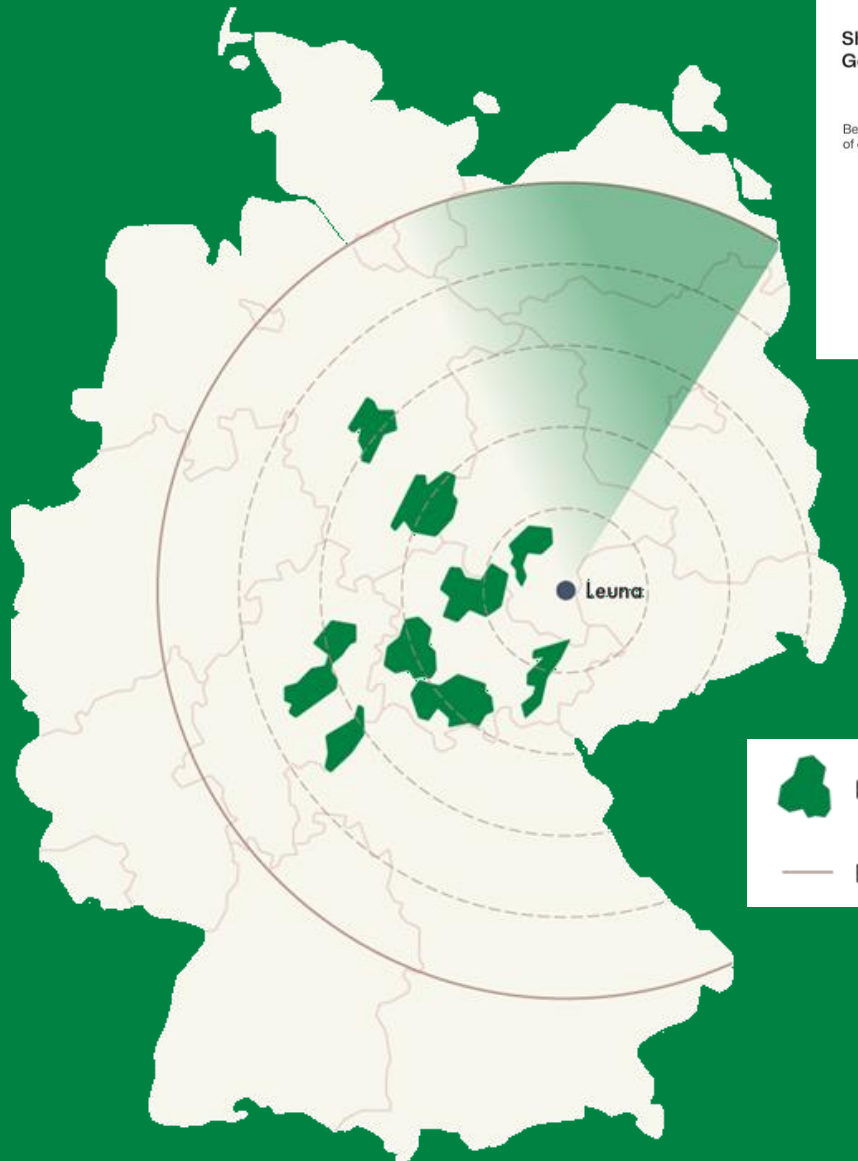
Production ramp-up:
2025

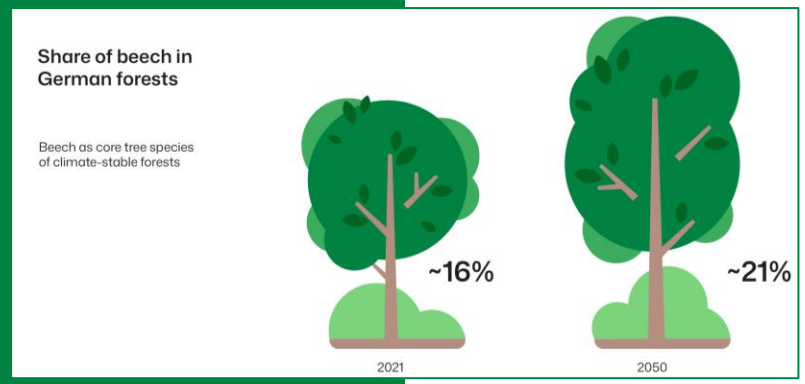
Beechwood-based products:

- → Bio-Monoethylene Glycol (BioMEG)
- → Bio-Monopropylene Glycol (BioMPG)
- → Renewable Functional Fillers (RFF)



Our raw material: Beechwood



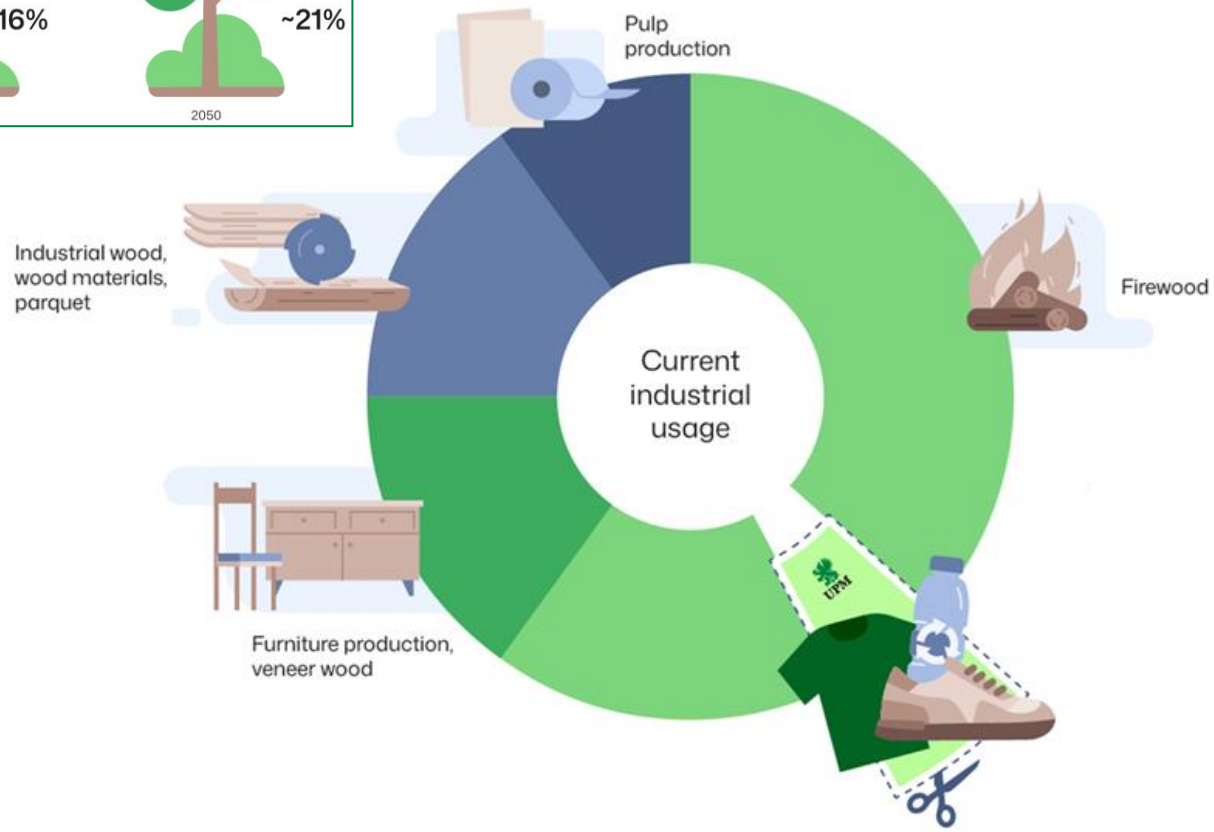


Primary sourcing focus

Extended sourcing areas

FSC
www.fsc.org
FSC® C210095
The mark of responsible forestry

PEFC
PEFC/04-31-3869



Laying the Foundation: The Woodyard Comes First

04/2021

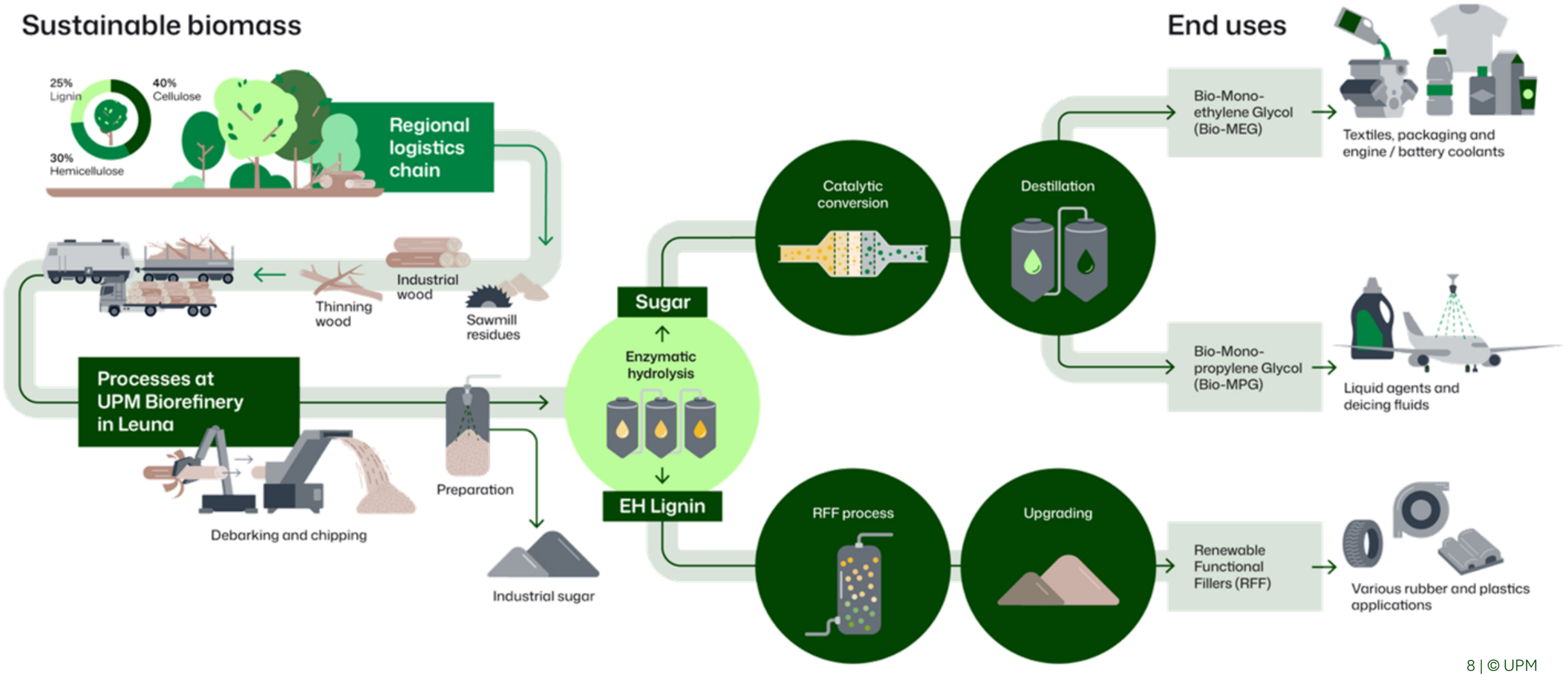
05/2022

06/2023

06/2024

05/2025

UPM's biorefinery complexity calls for a sequenced start-up



The main area spans the equivalent of 20 soccer fields

04/2021

05/2022

06/2023

06/2024

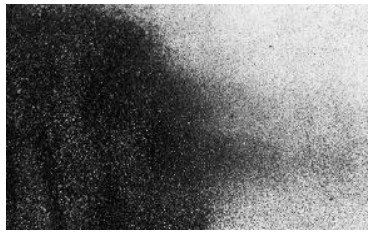
05/2025

UPM Biochemicals is a frontrunner in sustainable chemicals offering a distinct product value add

	Average sustainable chemical	UPM Biochemicals value add
CO_2 negative from day one*		High **GHG reduction**
Renewable carbon		**100% biogenic feedstock**
Certified, sustainable biomass		**Fully certified and traceable, non-food feedstocks**
Regional value chains		**Supply security** and credible **social sustainability**
Enhanced product performance		**Additional technical performance**

* from cradle to gate based on revised and third-party validated LCA according to ISO 14040 and ISO 14044 considering biogenic carbon from our feedstock and purchasing green electricity
#with unlimited use quantity in the final product

UPM BioPrimo™ Lignin and UPM BioMotion™ RFF: perfect application areas for each kind of material

UPM BioPrimo™ **Lignin**		**UPM** BioMotion™ **RFF**	
BioSource for Carbon Materials		Tires	
	Biodegradable Plastics (e.g., mulch films)		Mechanical Rubber Goods (e.g., profiles, hoses)
Bio-based XPS Insulation Boards		NIR-sortable Black Pigment	
	Bio-based Asphalt (replacing fossil bitumen)		Bio-Based Light-Weight Filler for Plastics

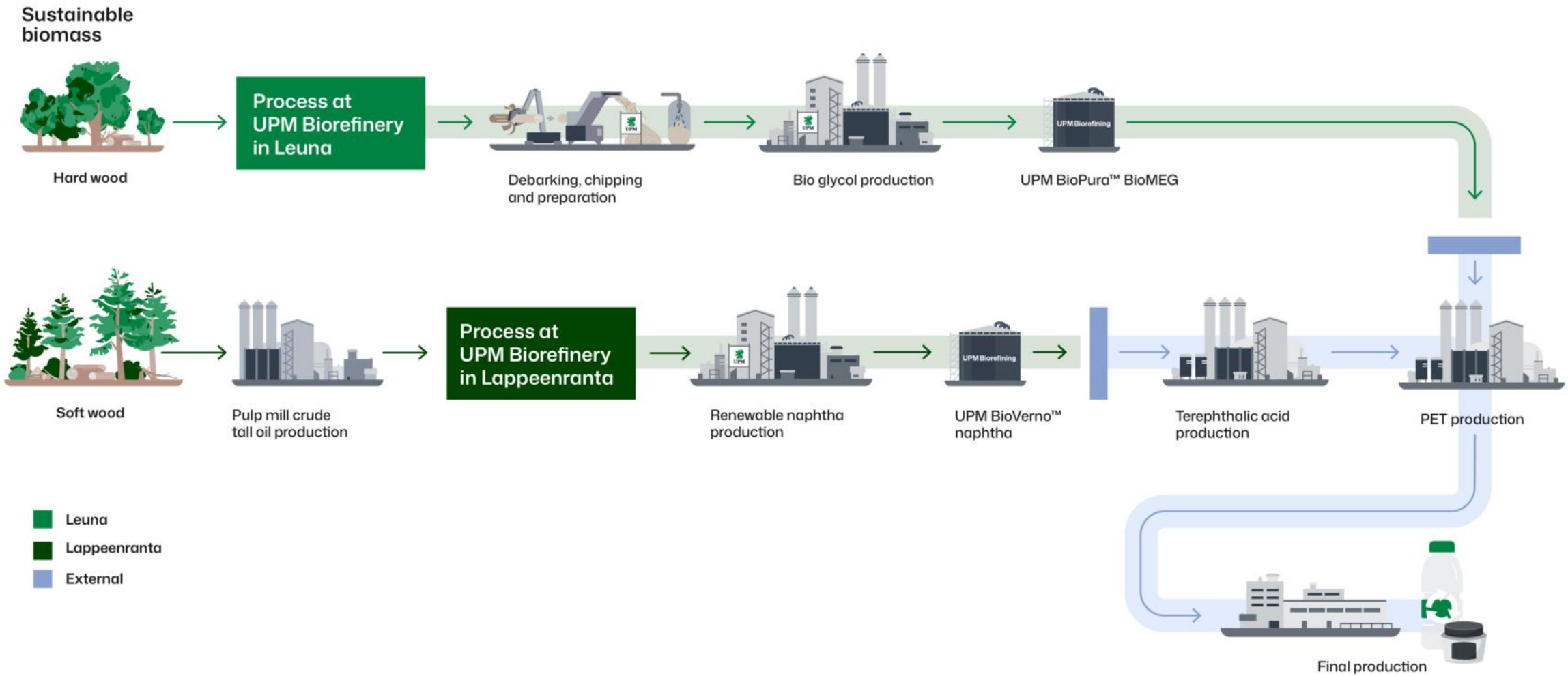
UPM BioPura™ MEG – Partnering for Sustainable Solutions

Renewable carbon content: 30 %

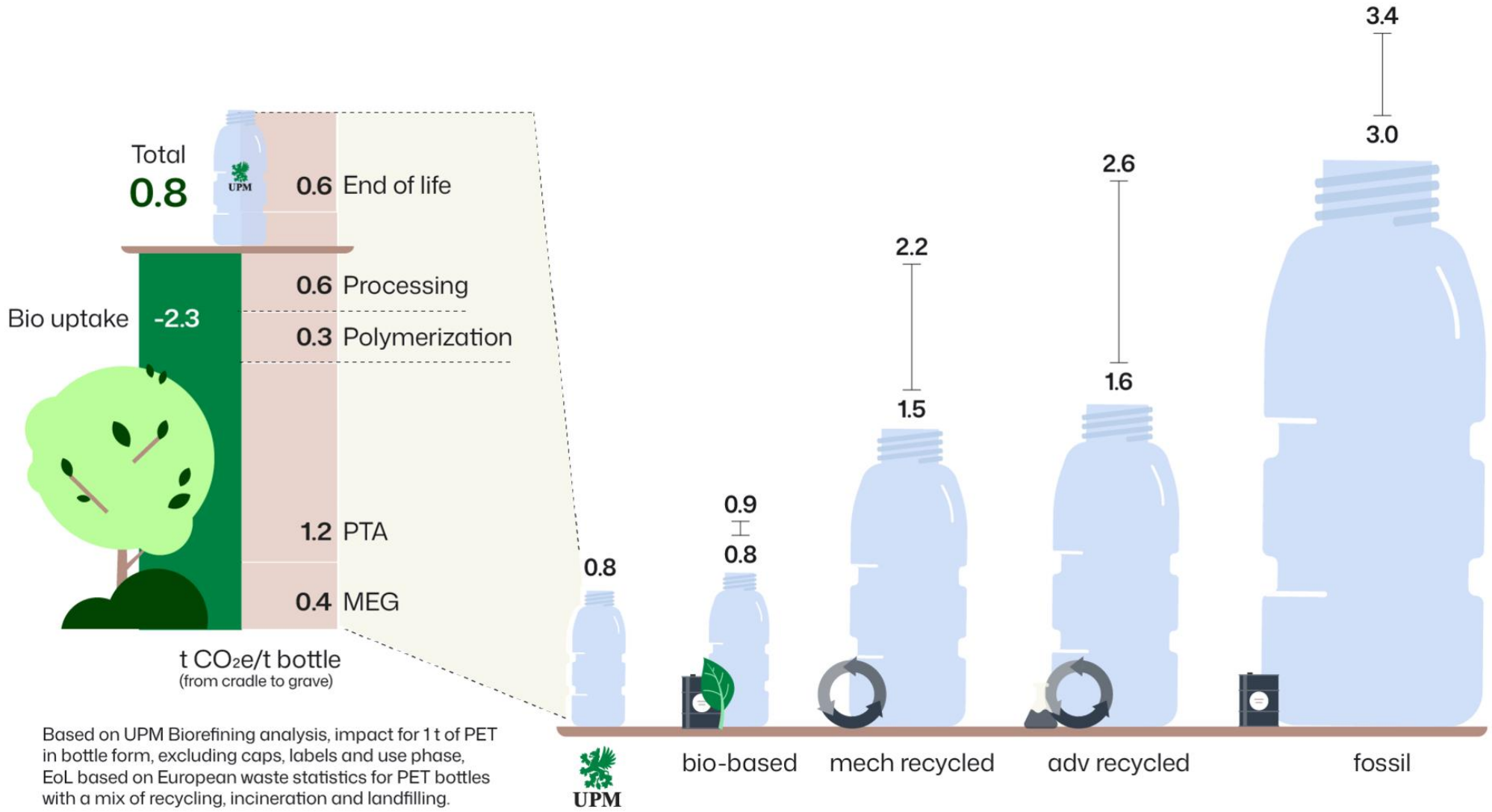
Renewable carbon content: 30 %

Renewable carbon content: 99 %

UPM is working on 100% BioPET – available in 2025



The use of 100% BioPET presents a strong opportunity for reducing GHG emissions beyond what recycling can offer



Based on UPM Biorefining analysis, impact for 1 t of PET in bottle form, excluding caps, labels and use phase, EoL based on European waste statistics for PET bottles with a mix of recycling, incineration and landfilling.

The Journey Continues: What Lies Ahead?

- production ramp up H2/2025
- full capacity expected to be reached in 2027
- continuous process improvements
- valorization of industrial sugar stream in own production processes
- the next biorefinery


UPM