

Scaling up in Decarbonisation solutions

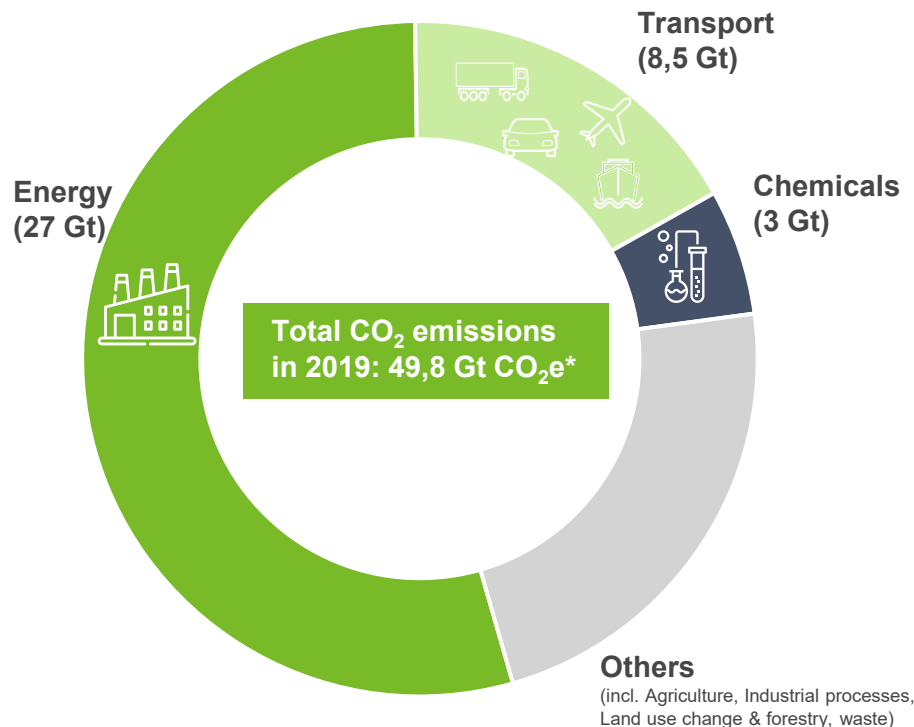
Winfried Schaur, EVP, Technology and UPM Biorefining



Decarbonisation solutions



The need for decarbonisation remains pressing – UPM offers solutions for key sectors

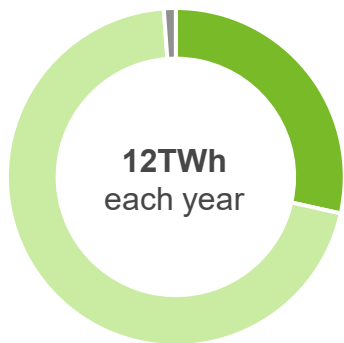


- **Energy, Transportation and Chemicals** industries contribute **>75%** of total emissions globally
- Energy as the only sector with scalable emission reduction options available today
- Transport sector with emerging set of decarbonisation options around advanced biofuels and eFuels
- Chemical industry defossilisation as key enabler to reduce CO₂ footprint of manufactured goods

UPM's electricity generation portfolio is clean and efficient to match the future needs



UPM Energy electricity generation is 99% CO₂-free

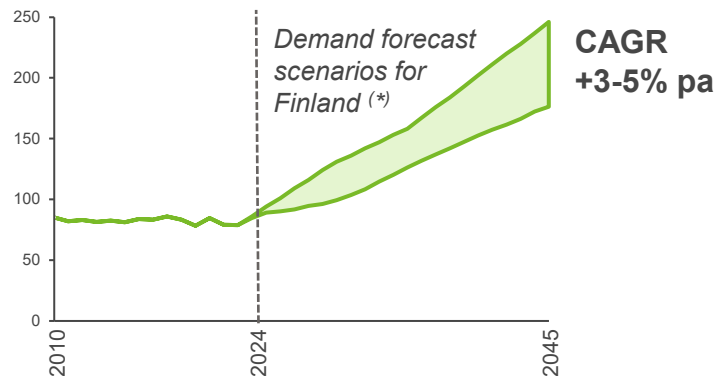


■ Hydro ■ Nuclear ■ Thermal

UPM Energy

- **Flexible hydro** power crucial to balance the volatile energy system
- **Reliable nuclear** power to support the electrification of the society

Electricity demand is expected to grow significantly



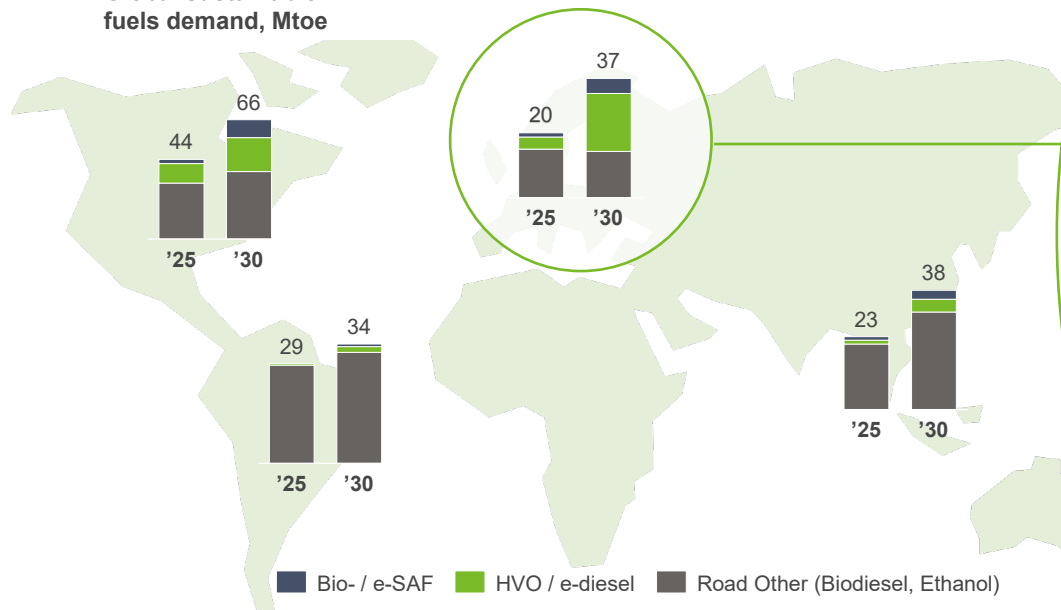
Electricity demand growth requires reliable CO₂-free baseload

- **Near term**; electric heating (large scale electric boilers and heat pumps), data centres and traffic
- **Longer term**; industrial decarbonisation and electrification

Global renewable fuels demand outgrows planned capacity as of 2030

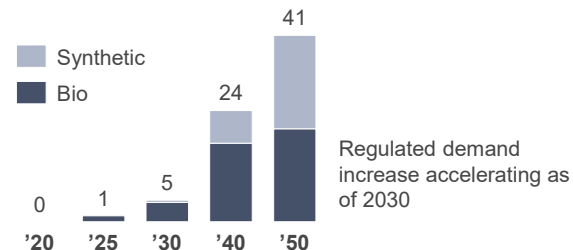


Global sustainable fuels demand, Mtoe

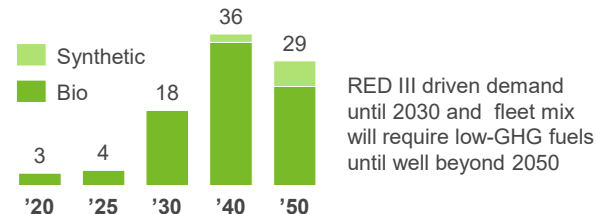


1) Including Norway and UK; Road demand 2030 estimate including upside from RED III implementation – current regulations ~12 Mtoe demand

EU SAF¹, Mtoe

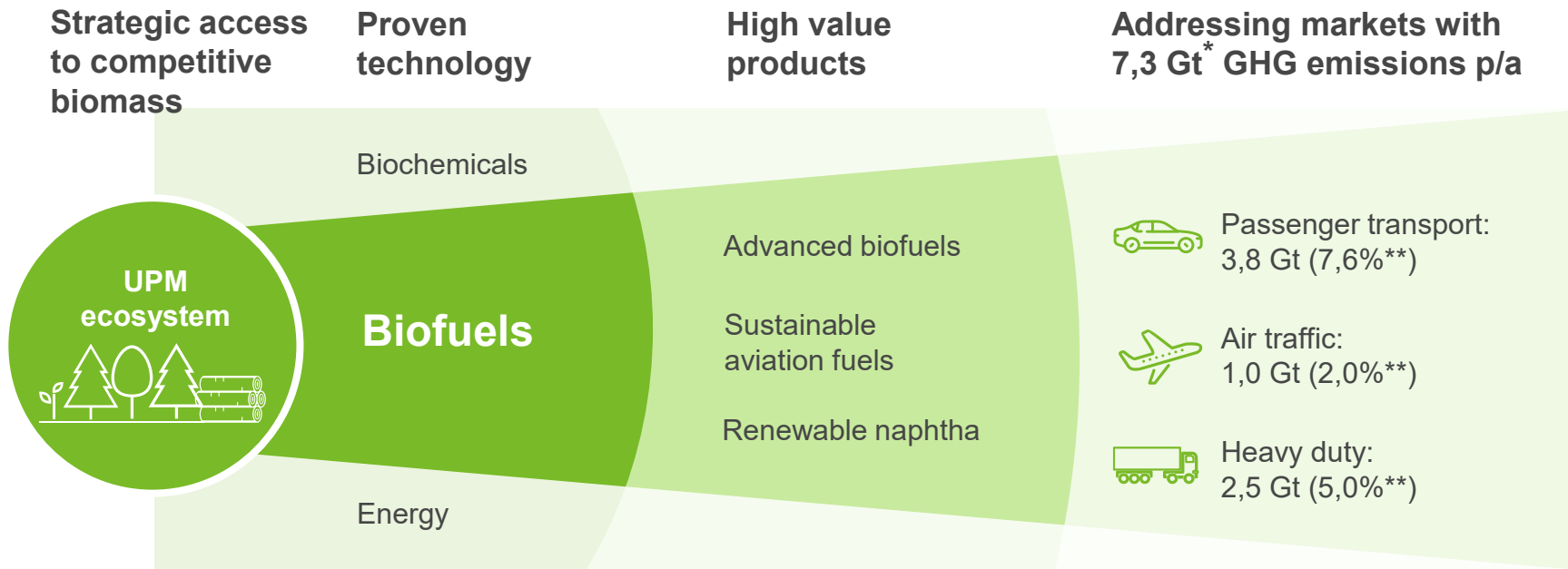


EU Road Renewable Fuels¹, Mtoe



Source: UPM Analysis based on Bloomberg NEF, Goldman Sachs Research, IEA, McKinsey, Neste, Wood Mackenzie

UPM Biofuels differentiation comes from competitive feedstock base and proprietary technology



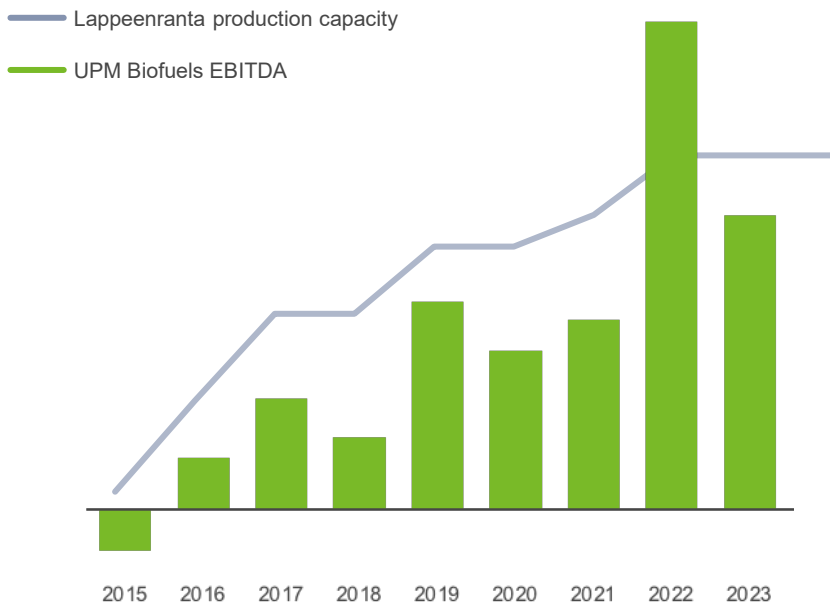
* UPM Analysis based on World Resources Institute, 2020 & International Energy Agency, 2020

** share of global GHG emissions

Current challenging market situation affecting 2024, strong track record and positive long-term outlook



UPM Biofuels EBITDA and production capacity



- Lappeenranta Biofuels today at **135% of nominal capacity**
- **EBITDA** margin average 2019-2023 **27%**
- **EBIT** margin average 2019-2023 **20%**
- **ROCE** average 2019-2023 **33%**

We continue pursuing growth for Biofuels while focusing on the recovery of existing business



Current Biofuels operations are a strong basis for profitable performance in growing markets

Basic engineering for a second refinery in Rotterdam is progressing, technology platform chosen

Testing new UPM technology for processing integrated feedstocks at larger scale takes approx. 2 years

UPM Biochemicals – a set of entirely new products to help decarbonise a large variety of end-uses



Leuna products*

Material and end-use applications

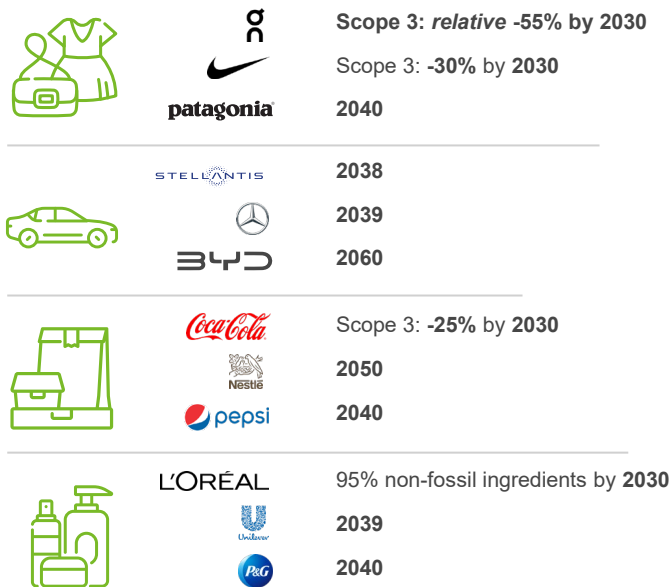


* Industrial sugars as a major side-stream will be sold for Bioethanol and Sweetener production, valorisation in own processes as a next step

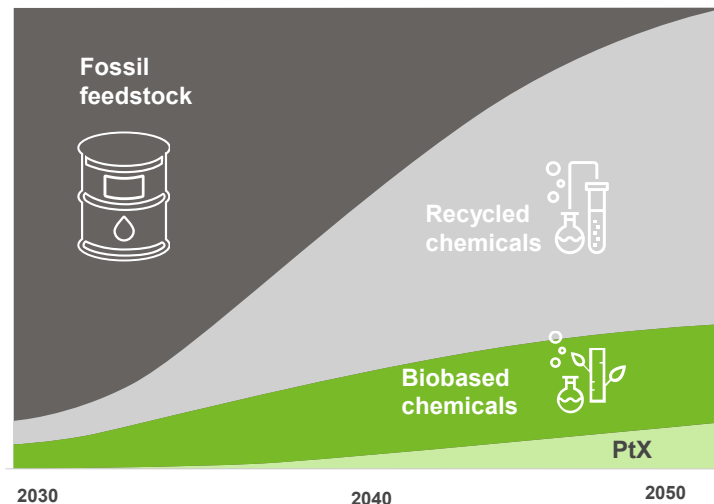
Biobased chemicals are central to the transition away from high-CO₂ materials



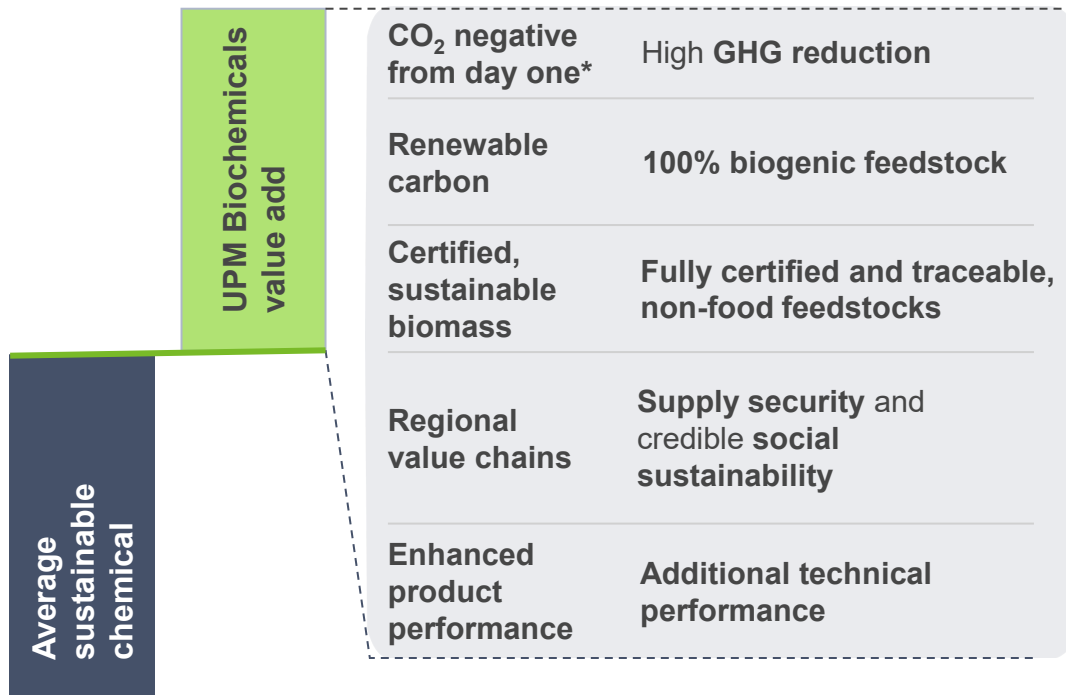
Net-zero commitments of major global brands will reflect on demand for sustainable chemicals



The shift away from fossil feedstocks will rely on bio-based solutions as first option to scale



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



Strategic partnerships with leading players in various regions and industries confirm high demand for UPM products



* Considering the biogenic carbon from our feedstock & purchasing 100% green electricity

We address markets and segments with high future demand for sustainable solutions



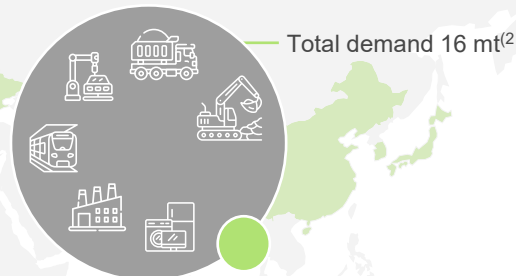
Global MEG market



25 kt
current renewable glycols supply

Leverage strong future need for sustainable materials in automotive, packaging, textiles

Global functional filler market



150 kt
renewable/recycled functional filler supply

Valorise strong advantage of negative CO₂ product footprint, weight-reduction etc. in various applications, from automotive to packaging

After reaching full capacity, Leuna will focus on capacity increase, cost optimisation and additional side stream valorisation. We expect ...



Sequential
production
start in Q4
2024

100%
capacity
utilization as
of 2027

Positive
EBIT in
2027

Biochemicals
business
long-term
ROCE target
14%

Thinking beyond Leuna – a clear growth path for UPM's Decarbonisation solutions



Power-to-X

Explore, develop, invest

Biochemicals

Ramp-up, prove, scale

Biofuels

Operate, develop, scale

- Return to profitability
- Enable SAF production
- Validate technology options
- Enhance feedstock options
- Prepare to scale with second fuels refinery

- Ramp-up Leuna
- Prove commercial viability
- Drive valorisation of Leuna production
- Consider future locations for second biorefinery
- Prepare to scale with second biochemicals refinery

- Explore portfolio options based on own feedstock
- Develop technology and capabilities
- Investigate operation model and locations
- Prepare to invest

UPM **BIOFORE**
BEYOND FOSSILS

