

UPM Biofuels Driving cleaner traffic

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UPM Lappeenranta biorefinery – proven business in renewable fuels and naphtha



The world's first biorefinery
producing renewable diesel and
naphtha from wood-based residues

130,000

t/a production
capacity

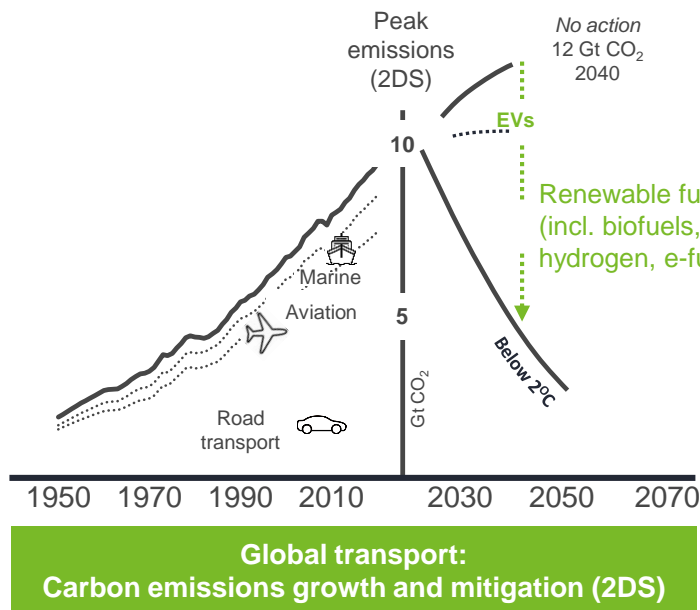
Financials 2019

EBIT margin 20%
ROCE 26%

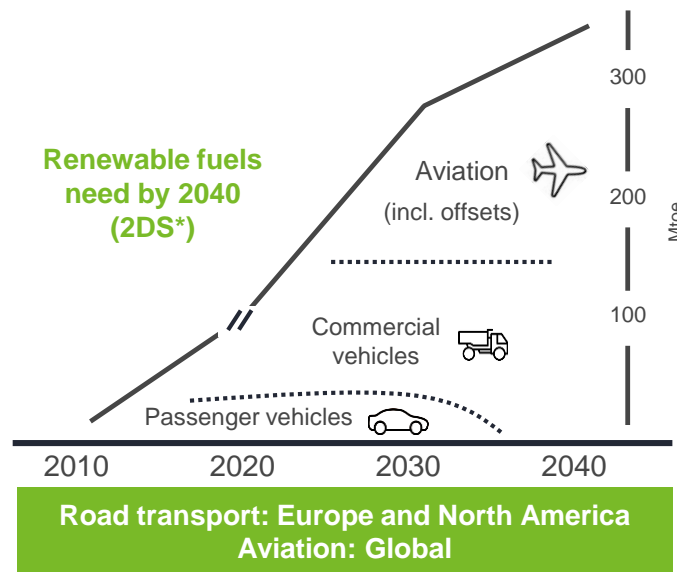
-80%

Greenhouse gas
emissions

Carbon mitigation in transport is dependent on renewable fuels despite recent decline in fuel consumption



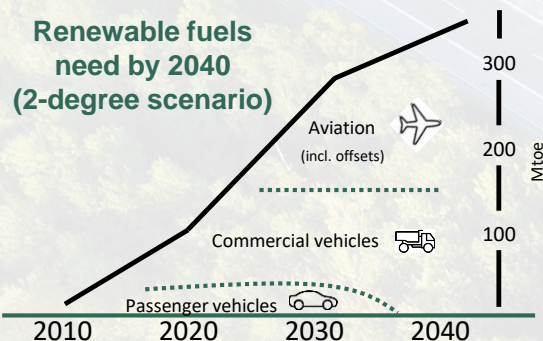
Source: UPM based on IEA, EIA, Bloomberg



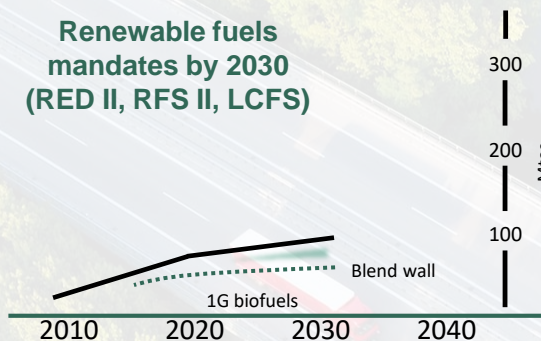
*The two degree scenario (2DS) is calculated vs. 2005 reference per sector (-30% 2030, -40% 2040, -50% 2050)

Source: UPM based on WoodMackenzie, Bloomberg, ICAO, EIA

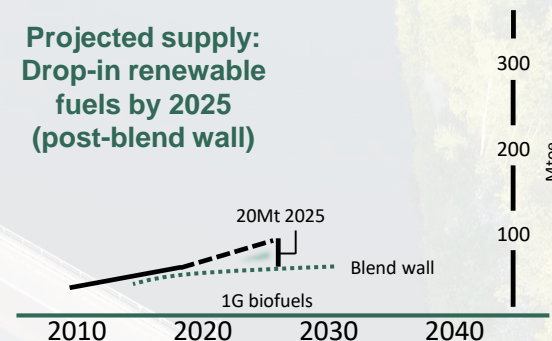
Transport decarbonization sets demand for renewable fuels: mandates grow with supply



Road transport: Europe and North America
Aviation: Global



Road transport: Europe and North America



Drop-in renewable fuel (HVO)
projected capacity growth: Global

UPM Biofuels' competitive edge to be built on resilient ecosystem and agility to select markets



NEW SUSTAINABLE BIOMASS

Sustainable and uniquely upstream integrated feedstock pool

- Additionality
- Climate positive land use



Carbon stored to soil in each cycle

CLIMATE-POSITIVE FUELS

Efficient carbon neutral production



Cellulosic fuels

Renewable diesel, gasoline and jet

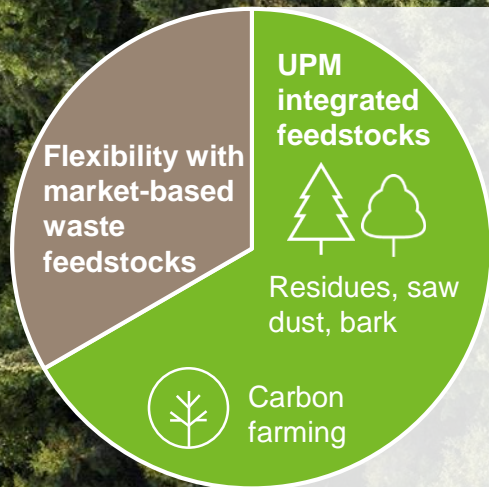
E-fuels future potential

DECARBONIZED TRANSPORT AND PETROCHEMICALS

Flexibility to create maximum value from several end uses and market geographies



UPM's sustainable biofuel feedstock concept founded on wood based and climate positive feeds



INTEGRATED WOOD BASED AND CLIMATE POSITIVE FEEDS

complemented with sustainable market based feedstocks



UPM Lappeenranta biorefinery
130,000t



Planned biorefinery
500,000t



VALUE FROM SEVERAL END-USES

Road transport, petrochemicals and aviation

New potential multi-feedstock biorefinery – origin in sustainable forestry



RESIDUES, SAW DUST and BARK to renewable fuels

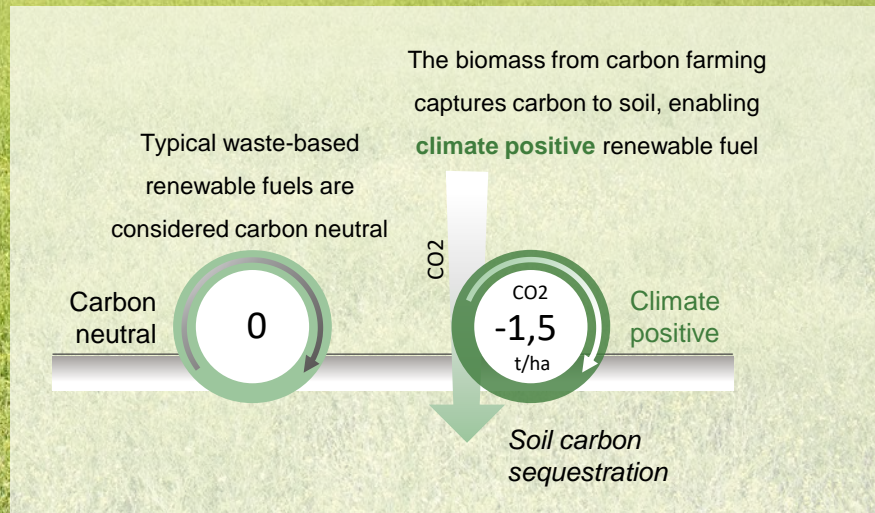
No increase in harvesting or land use

Outside food value chain

Carbon farming supplements UPM's sustainable land use operations



Cumulatively approx. 50,000 hectares cultivated
Second crop and income source for farmers
Increases soil carbon and soil health



Status of the new potential biorefinery

Ongoing:

Feasibility study

Evaluation of technology and raw material concept ongoing

Next steps:

Planning, permissions, investment

Preparing for basic engineering phase and optimal site selection

Biofuels related regulation in the EU and in the member states will also impact the future investment considerations

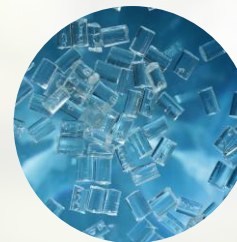
UPM Biochemicals – Responsible choice

Jyrki Ovaska

EVP, Technology

9 September 2020

Scalable biochemicals platform is a result of ten years of intense development



UPM **Biochemicals**
LEUNA



2012



2012–15

Broad evaluation of various **sites, technologies and chemicals**

2015–16

Commercial assessments of **different chemicals and markets**

2015–16

Feasibility engineering studies for **short-listed concepts**

2017–18

Basic engineering for the potential first biorefinery, commercial projects

2019

Preparations to start UPM's regular process of analysing and preparing an investment decision

2020

Final investment decision and project implementation

EUR 550 million
220,000 tonnes

Biochemicals Leuna investment project is proceeding at full speed

- Detailed engineering and procurement activities well advanced
- Permitting process proceeding according to the plan
- UPM team on the site and construction preparations started
- Safety and sustainability based on UPM's high standards



UPM BIOCHEMICALS

Customer value is a result of high performance and ease of use combined with the best sustainability



- UPM biochemicals respond to customers' increasing needs for renewable alternatives in their businesses
- Current supply is limited and high-quality biochemicals are priced at a premium in the markets
- No compromise on quality, performance, fit into customers' processes and the existing recycling infrastructure
- Go-to-market strategy focuses on building the right partnerships in the value-chain and with the brand owners

MAIN PRODUCTS

UPM BioMEG

Renewable
Functional Fillers

Industrial Sugars

UPM BioMPG

Monoethylene glycol is used in different industries and various applications



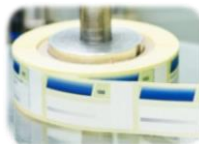
PACKAGING



TEXTILES



FILMS



Global Market:

Demand:
 >30 million tons/a

Growth:
 1,3mt/a, CAGR: 3,7%*

*Source: IHS 2019

Move to a lighter and more sustainable future – UPM's renewable functional fillers



Renewable functional fillers offer superior technical and environmental performance in various rubber and plastic end-uses, such as automotive tires, profiles, and interior and exterior parts.



Global Market:

Demand:
>15 million tons/a

Growth:
0,5mt/a, CAGR: 3,0%*

Wood – the sustainable and responsible choice for biochemicals refinery



- Wood is a renewable, non-food, climate neutral feedstock with global certification schemes.
- Forest thinnings and residues of regional sawmills will be used
- An entirely European value chain
- The investment is in line with Germany's bioeconomy strategy



Renewable
feedstock



Sustainable
forestry



Non-food

Good cost position due to value chain integration, technology concept and central location



UPM Project

VALUE-CHAIN INTEGRATION

Bioroute



Sustainable
Biomass
(Wood)

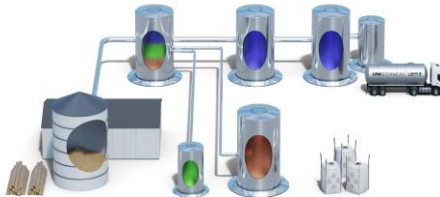


Sugar platform
(Sugars)

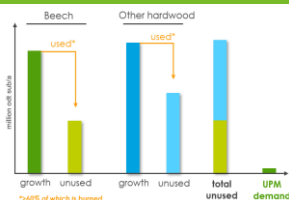


Intermediate
(Monoethylene
glycol)

TECHNOLOGY CONCEPT



CENTRAL LOCATION



Customers
Wood & Other Inputs
Infra & Competences

Entry barrier to wood-based biochemicals business is high and a multi-piece puzzle



FOREST
MANAGEMENT
PRACTICES



COMPETITIVE
SUPPLY CHAIN
FOR WOOD



COMPETENCE
ON INDUSTRIAL
BIOPROCESSES



WOOD
CHEMISTRY
KNOWLEDGE



LONG-TERM
COMMITMENT
AND R&D



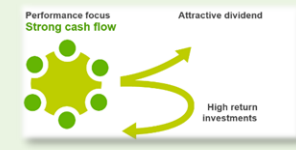
INTELLECTUAL
PROPERTY
RIGHTS



CORPORATE
SUSTAINABILITY
PROFILE



FINANCIAL
CAPABILITY
TO INVEST



Entry into biochemicals creates a new transformative growth business platform



NEW PLATFORM

- Next generation, industrial scale biochemicals refinery
- First building block of UPM Biochemicals platform



BEYOND FOSSILS

- Strong market pull to replace fossil-based chemicals
- Opens totally new markets with unique customer value



FUTURE GROWTH

- Scalable concept with high barriers of entry
- Strong and synergistic fit with UPM platform



UPM **BIOFORE**
BEYOND FOSSILS

