CLIMATE POSITIVE FUELS

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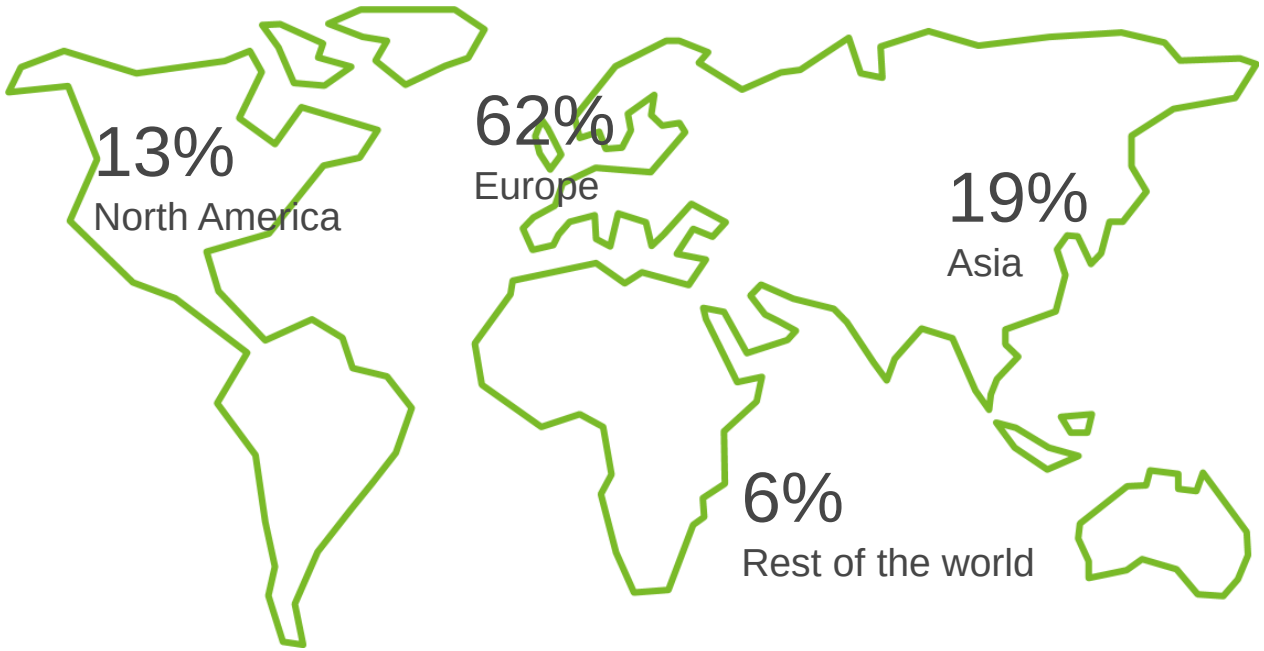
UPM BIOFORE - BEYOND FOSSILS

WHAT ROLE FOR NEW SUSTAINABLE FEEDSTOCK

Global businesses – local presence

UPM's sales by market

EUR 8,600 million



54 production plants in 12 countries

19,000 employees in 46 countries

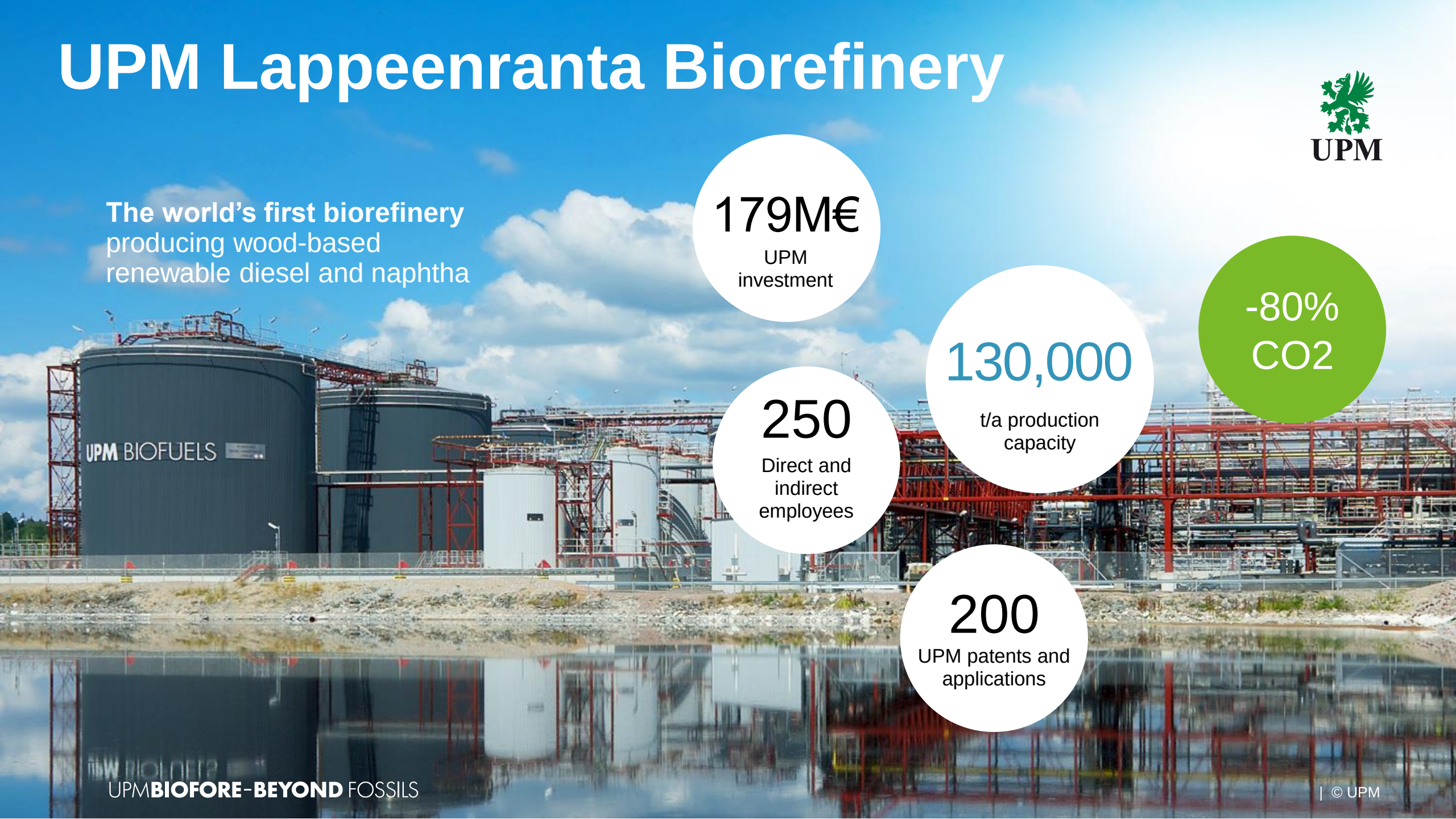
12,600 customers in 110 countries

100,400 shareholders in 32 countries

24,000 b-to-b-suppliers in 75 countries

UPM Lappeenranta Biorefinery

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



179M€
UPM investment

250
Direct and indirect employees

130,000
t/a production capacity

-80% CO2

200
UPM patents and applications

UPM Biofuels is planning a second possible biorefinery

Basic engineering phase started – final location is open: Kotka or Rotterdam

- Environmental impact assesment completed in Kotka, Finland
- Capacity 500 000 t/a of advanced biofuels
- Vast feedstock base, e.g. solid biomass and carinata
- Technology: biomass conversion and hydrotreatment

GROWING DEMAND FOR SUSTAINABLE FEEDSTOCK

How to scale up the advanced biofuels industry?

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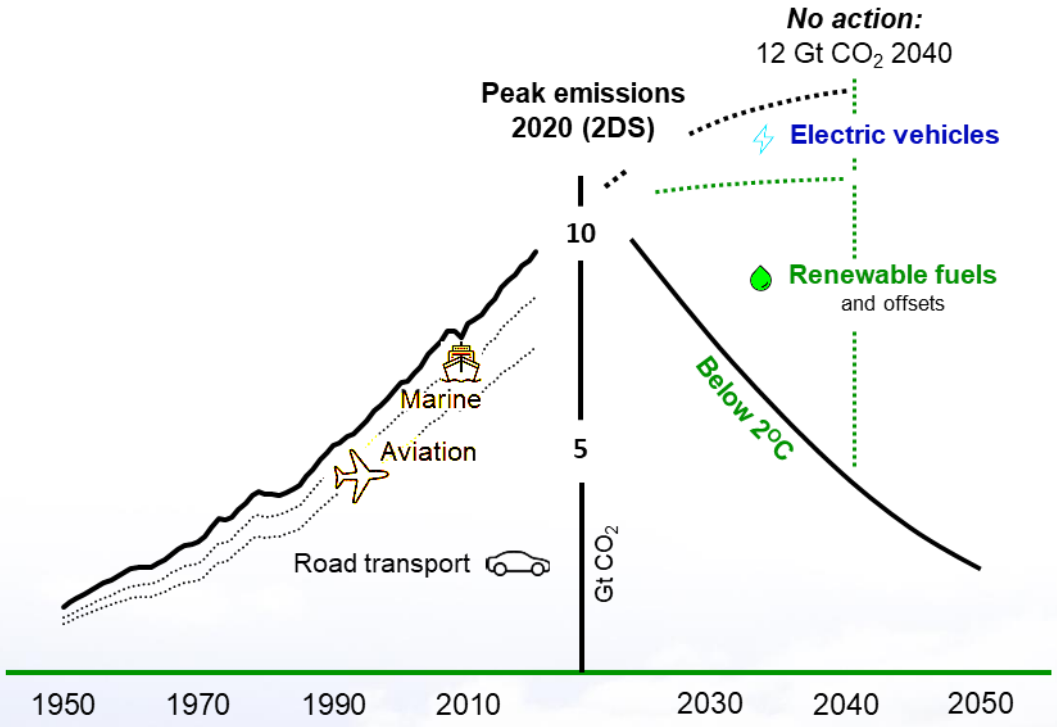
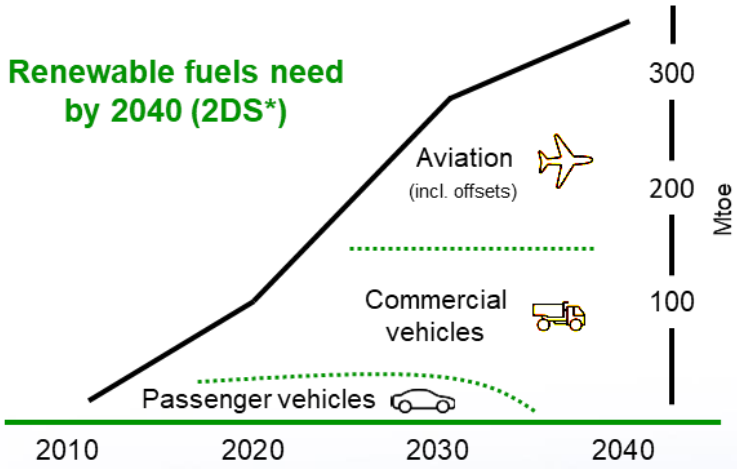
Carbon mitigation in transport is dependent on renewable fuels – Aviation to become biggest renewable fuel consuming sector



Global transport:
Carbon emissions growth and mitigation (2DS)



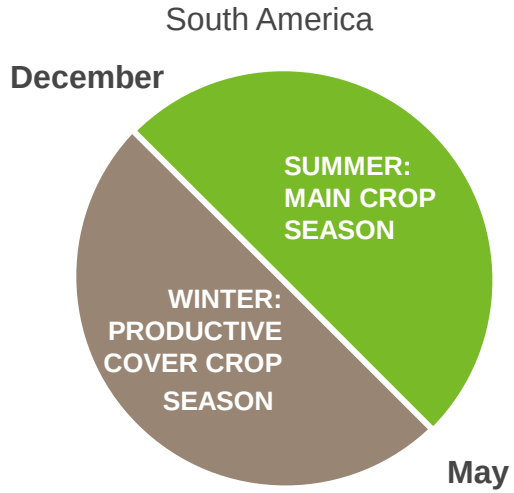
Road transport: Europe and North America
Aviation: Global

Source: UPM based on WoodMackenzie, Bloomberg, ICAO, EIA, IEA
*The two degree scenario (2DS) is calculated vs. 2005 reference per sector (-30% 2030, -40% 2040, -50% 2050)

Climate positive farming

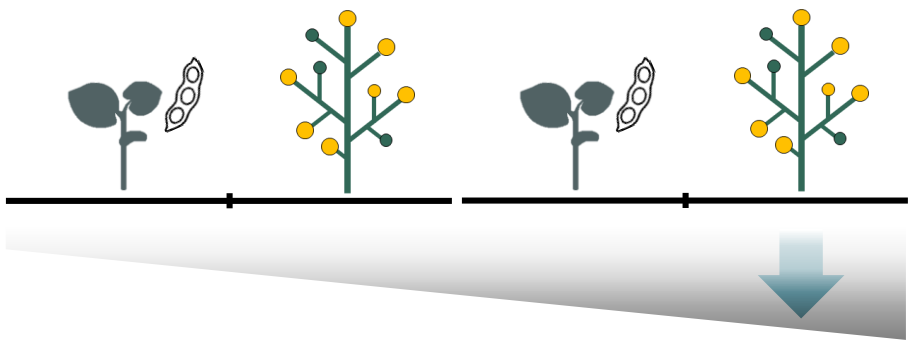
TARGETS

- Additional biomass outside main cultivation season -
  No impacts on land-use
- Higher rates of carbon sequestration to soil and improved soil productivity
- High GHG-reduction from sustainable way of farming
- Sustainable additional raw material for producing biofuels



Adoption of sustainable soil management practices is in the core of climate positive farming system

CLIMATE POSITIVE FARMING



Additional biomass with no displacement › *Positive soil carbon balance and soil health*

MANAGEMENT PRACTICES

Introduction of an additional cover crop to the existing crop rotation, in areas and during seasons where the land is not typically in productive use

Production system internal carbon inputs into soil, e.g:

- *Cover cropping*
- ***High biomass crop development***
- ***Diversification of crop rotation / crop planning***

Production system external carbon input into soils

- ***Biosludge, manure etc.***

Minimizing soil disturbance

- *Minimum or no tillage*

BENEFITS

- *Reduced soil erosion*
- *Higher nutrient retention and recycling*
- *Improved water quality and conservation*
- *Higher rates of carbon biosequestration*
- *Increased yields and productivity with no land use change or crop displacement*
- *Increased biodiversity*
- *Additional income for the growers as a result of higher soil productivity*
- *Additional protein*
- *Climate change mitigation*

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Inspired by the limitless opportunities of bioeconomy

Delivering renewable and responsible solutions

Innovating for a future beyond fossils

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