



The Biofore Company **UPM**

Where is the bioeconomy?

UPM the Biofore Company

Stefan Sundman

Vice President, Public Affairs

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THE FOREST OF NEW OPPORTUNITIES

The world is changing

Resource scarcity
Change in economic gravity
Climate change
Digitalisation

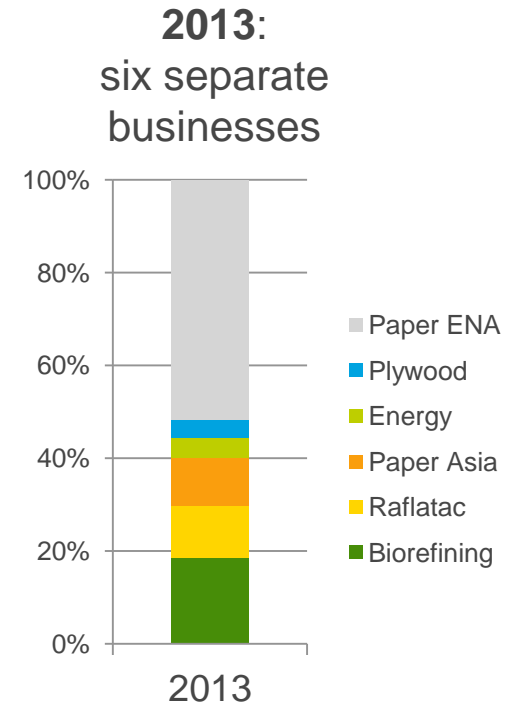
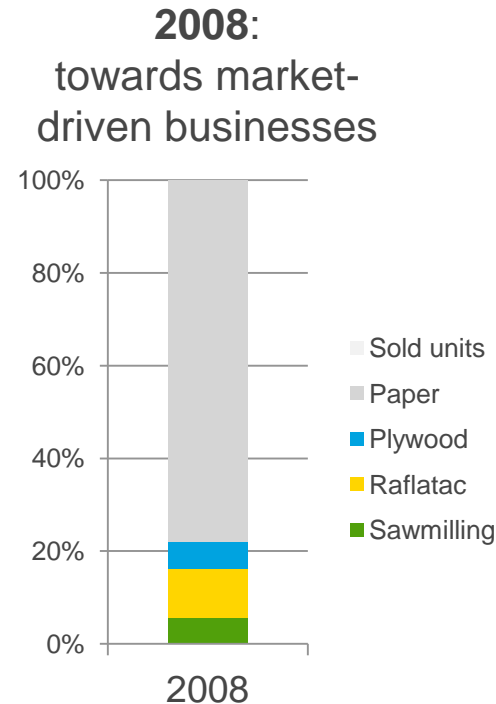
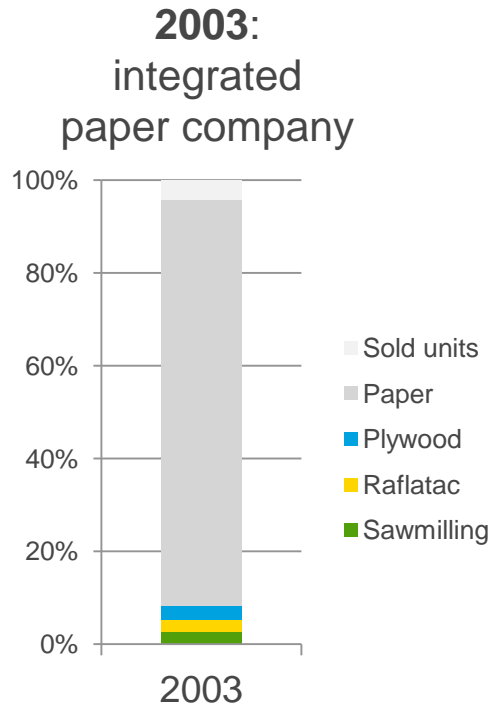
Biofore – growth and competitive advantage

Material and energy efficiency
Renewable and recyclable products
Innovations and new businesses



UPM in transformation

Business portfolio, sales



| | |
|------------|-----------|
| Sales | EUR 9.9bn |
| EBIT (*) | EUR 429m |
| Net debt | EUR 4.9bn |
| Market cap | EUR 7.9bn |
| Personnel | 34,500 |

| | |
|------------|-----------|
| Sales | EUR 9.5bn |
| EBIT | EUR 513m |
| Net debt | EUR 4.3bn |
| Market cap | EUR 4.7bn |
| Personnel | 25,000 |

| | |
|------------|------------|
| Sales | EUR 10.1bn |
| EBIT | EUR 683m |
| Net debt | EUR 3.0bn |
| Market cap | EUR 6.5bn |
| Personnel | 21,000 |

Integration of current operations and competencies into new knowledge and operations

Current businesses
&
competencies



New knowledge
&
new businesses



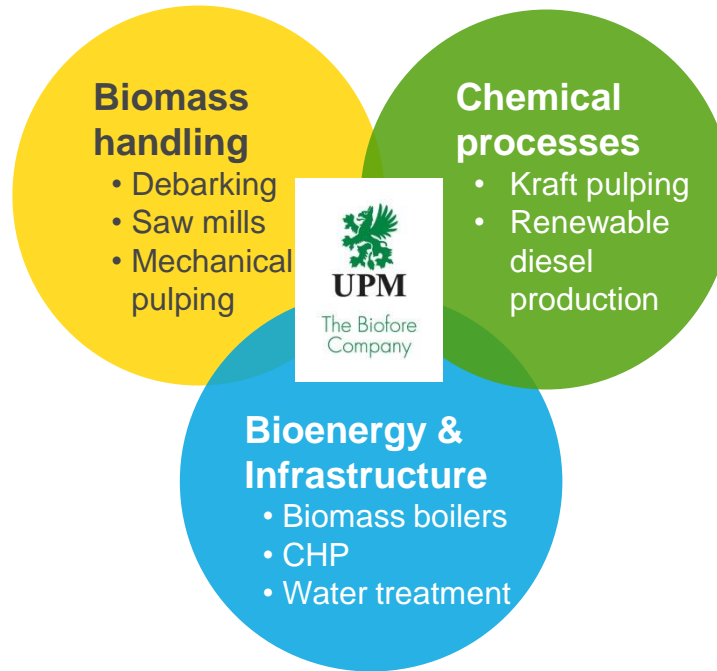
New
forest industry

An excellent position to integrate processes for new bioproducts

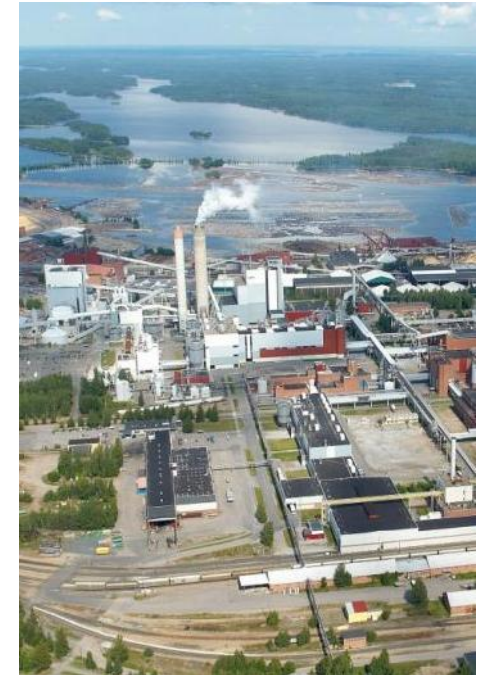
1) Access, management and sourcing of biomass



2) Processes of biomass conversion



3) Run sustainably large industrial processes



More with Biofore

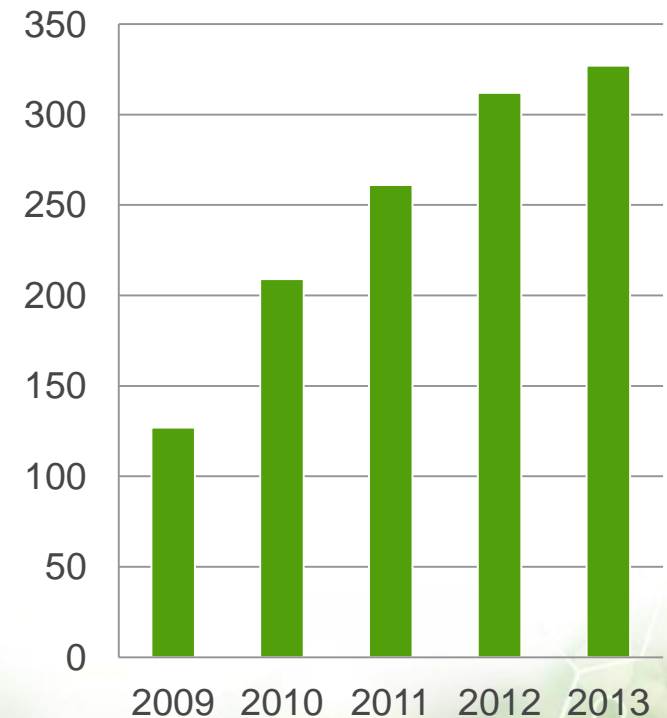
New businesses based on UPM's development and innovation work



The Biofore Company UPM

- Large target markets with potentially healthy profitability
- Sustainable competitive advantage based on IPR
- **Biofuels** renewable drop-in diesel suitable for all diesel engines
- **Biochemicals** sustainable drop-in alternatives for oil-based chemicals
- **Biocomposites** for injection moulding to replace oil-based raw materials

Annual patent filings 2009–2013



UPM Biofuels Strategy

Renewable fuels

- Drop-in fuels fully compatible with all diesel engines and fuel distribution systems



Wood-based raw materials

- Renewable wood-based raw materials
- Not competing with food production



Sustainable operations

- Sustainable supply chain
- Low emission products



UPM will become a major player in advanced biofuels

Biofuels investment: Capturing synergies by full integration into UPM Kaukas mill site in Lappeenranta, Finland



The Biofore Company UPM

- 1 RESEARCH CENTRE
- 2 PAPER MILL
- 3 BIOMASS POWER PLANT
- 4 PULP MILL
- 5 SAW MILL
- 6 BIOFUELS



Key facts:

Production of renewable diesel (pure hydrocarbons) from CTO

Investment: 175 mio €

Capacity: 100.000 to

Commissioning: 2014

UPM Biofuels

EUROPE'S **1st** WOOD-BASED RENEWABLE
DIESEL BIOREFINERY

UPM BIOVERNO

80% LESS
GREENHOUSE GAS
EMISSIONS

100%
RENEWABLE
RAW MATERIAL



UPM Formi

CARBON FOOTPRINT

-50%

SUBSTITUTES UP TO

50%

OF FOSSIL-BASED
NON-RENEWABLE
MATERIALS

PRODUCED FROM CELLULOSE FIBRE AND PLASTICS
FOR INJECTION AND EXTRUSION APPLICATIONS



100%

CAN BE MADE USING FSC® OR PEFC™
CERTIFIED NATURAL FIBRES

Opportunities are significant

Chemicals market: EUR 2.300B; thereof EUR 30B bio-based

incl. plastics
(270B€)

Biofibrils

Biochemicals

Gasoline + diesel market: EUR 1.800B;
biofuels: EUR 65B

Biofuels for transport

Labels and composites

Chemical pulp market:
EUR 30B

Pulp, paper, plywood and wood products

Wood and biomass procurement and logistics



Ready to demonstrate and convince

- Many oil-based plastic parts are replaced by parts from **biobased renewable composite materials** which can be recycled and reused.
- The Biofore Concept Car weighs 150 kg less than similar-sized cars
- Lightweight = low fuel consumption
- Street-legal in Finland



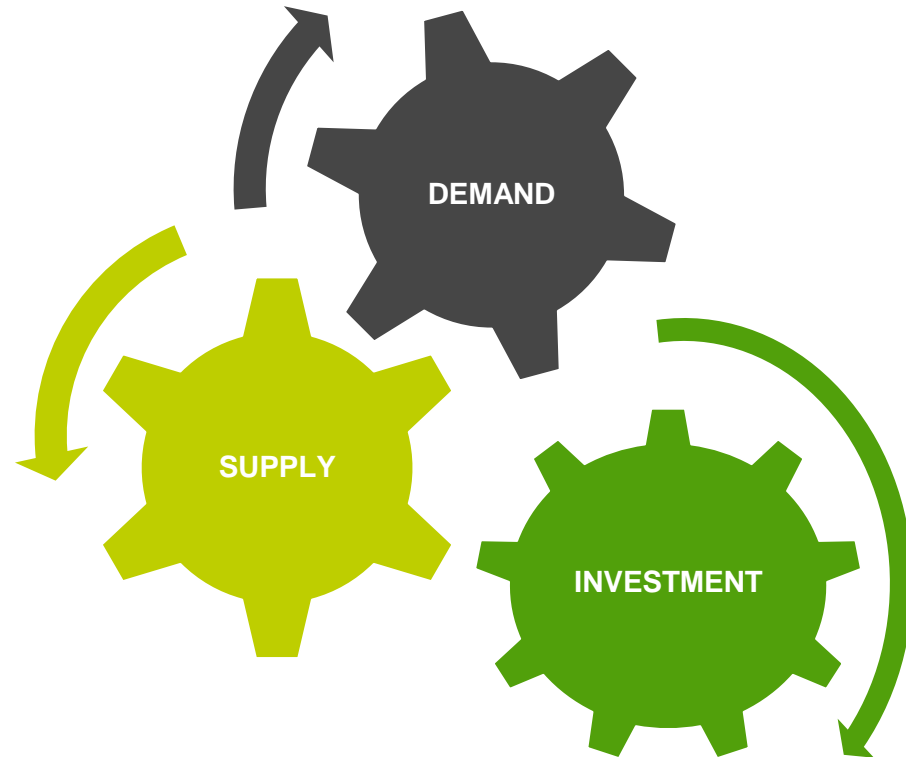
Driven by **Biofore**

<http://youtu.be/CbF99ScSkfY>



In summary

- The BBI PPP is an excellent tool for supporting development and investments
 - Common agenda for the whole BBI sector
 - Opportunity to form wide consortia
 - One decision for the whole development path
- The EU biobased industry needs to be competitive to be able to innovate and invest
 - Consistency and predictability of policies (esp. Biofuels)
 - Ensure sustainable raw material supply
 - Products need to be competitive
- Demand for biobased products shall be stimulated
 - Supportive solution oriented approach

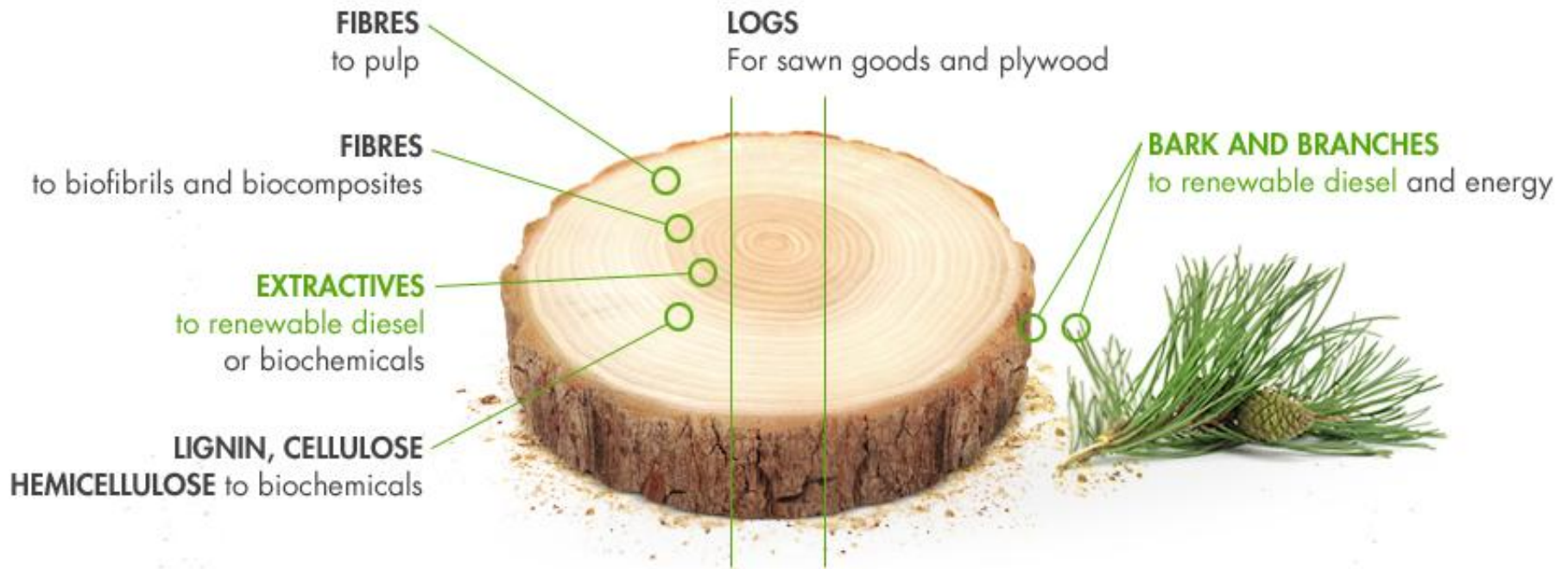




UPM

The Biofore
Company

Wood raw material is the basis of many different businesses at UPM



UPM ProFi

Main raw materials are the surplus paper and plastic left over from the production of UPM self-adhesive label materials

PRODUCTS FOR OUTDOOR APPLICATIONS IN CONSTRUCTION

100%
RECYCLABLE

RAW MATERIAL

>50%

FORMER WASTE

100%

PEFC™ CERTIFIED
PRODUCTS

