

UPM **BIOFORE**
BEYOND FOSSILS



THE BIOFORE CONCEPT CAR

DRIVEN BY BIOFORE





Can a car be resource-efficient?

Is it possible to replace traditional oil-based materials with advanced biomaterials?

Can majority of the car parts be later recycled and reused?

Can a car like this be a reality already today?

Biofore Concept Car is
the answer to all those questions.

**A car that drives
real sustainable
change!**



Metropolia and UPM:

New thinking meets new biomaterials

There's no way around it. Many industries have to look for resource-efficient alternatives to replace non-renewable materials. Materials, which are real alternatives to traditional oil-based components, without compromising quality, durability or safety.

The solution is growing in the forest.

UPM has engineered unique natural fibre composites and wood-based materials that combine sustainability and high performance.

Making use of these innovative biomaterials and knowhow, the **Helsinki Metropolia University of Applied Sciences** applied fresh thinking, futuristic design and bold engineering to come up with a car like no other: The Biofore Concept Car.

Doors and closures and many traditionally plastic parts are made of UPM Formi biocomposite and UPM Grada wood material. The car weighs approximately 150 kilograms less than an equivalent sized car. And what's more – this street-legal city car is fuelled by UPM BioVerno wood-based renewable diesel.

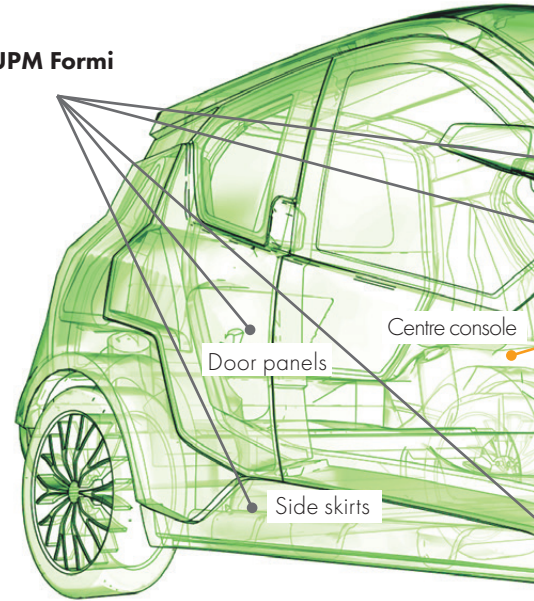


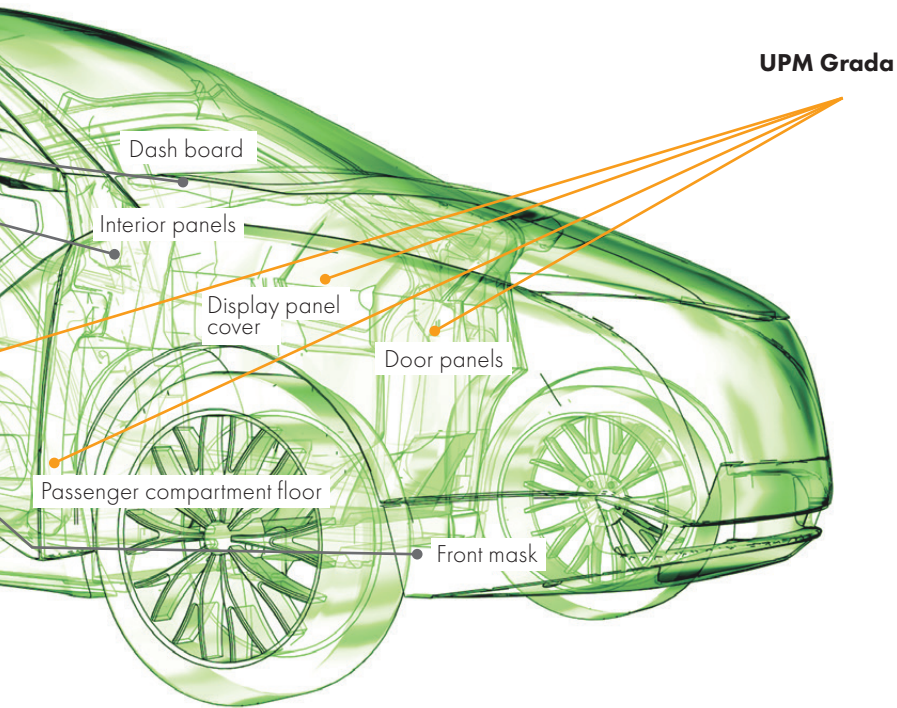
Biofore in Design

All biomaterials used in the car are cellulose fibre-based composite or thermoformable wood material which can be safely recycled or burned. The chassis of the car is made of carbon fibre and the load-bearing parts of metal.



UPM Formi





UPM Formi is a recyclable biocomposite manufactured from cellulose fibre and plastics. With UPM Formi, as much as 50% of oil-based non-renewable raw material can be replaced with renewable fibres.

UPM Grada is a thermoformable wood material with unique forming properties. The material enables visually aesthetic, high-quality ecological designs. The Grada technology revitalises the forming of wood with heat and pressure, and opens up totally new design opportunities.



UPM BioVerno is a wood-based renewable diesel, which will reduce greenhouse gas emissions by up to 80% compared to fossil fuels. It is suitable for all modern diesel engines – including the 1,2 litre low-emission diesel engine featured in the Biofore Concept Car.

UPM BioVerno renewable naphtha wood-based raw material for various types of plastics – used in automotive, textile, packaging and label applications.





UPM Raflatac's self-adhesive label materials are used to mark spare parts, as well as in the interior and exterior design of the car. The labels have been manufactured by using the latest adhesive technology and solvent-free production processes. Sustainability is one of the key drivers in UPM Raflatac's product development.

UPM BioMotion™ Renewable Functional Filler

The revolutionary wood-based fillers with outstandingly low environmental footprint, can replace traditional fossil-based, CO₂ intensive fillers in rubbers and plastics, used in weatherstrip, hoses, sealing systems, and other automotive rubber and plastic applications. UPM's RFF provide top product performance with considerably lower material weight and the highest level of purity.



The Biofore Concept Car was designed and manufactured in partnership with Helsinki Metropolia University of Applied Sciences, the Finnish Funding Agency for Technology and Innovation, and several other partner companies. The engineering and industrial design students of Metropolia designed and manufactured the car with the guidance of teachers who have successfully carried out several renown concept car projects.

www.bioforeconceptcar.upm.com

Metropolia

Helsinki Metropolia University of Applied Sciences, Finland's largest university of applied sciences, educates future professionals in the fields of culture, business, health care and social services, and technology. Metropolia is a reliable cooperation partner and an innovator in higher education.

www.metropolia.fi/en

UPM

Through the renewing of the bio and forest industries, UPM is building a sustainable future across six business areas: UPM Biorefining, UPM Energy, UPM Raflatac, UPM Paper Asia, UPM Paper Europe and North America and UPM Plywood. Our products are made of renewable raw materials and are recyclable. We serve our customers worldwide. The Group employs around 21,000 people and our annual sales exceed € 10 billion. UPM shares are listed on NASDAQ OMX Helsinki.

UPM – The Biofore Company

www.upm.com

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