



The Biofore Company



Driven by **Biofore**

The Biofore Concept Car



# 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.

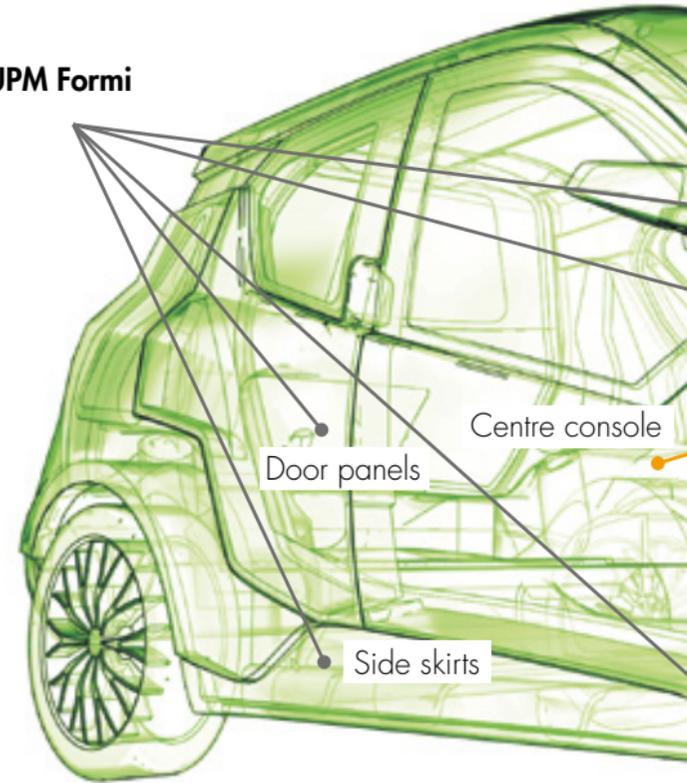


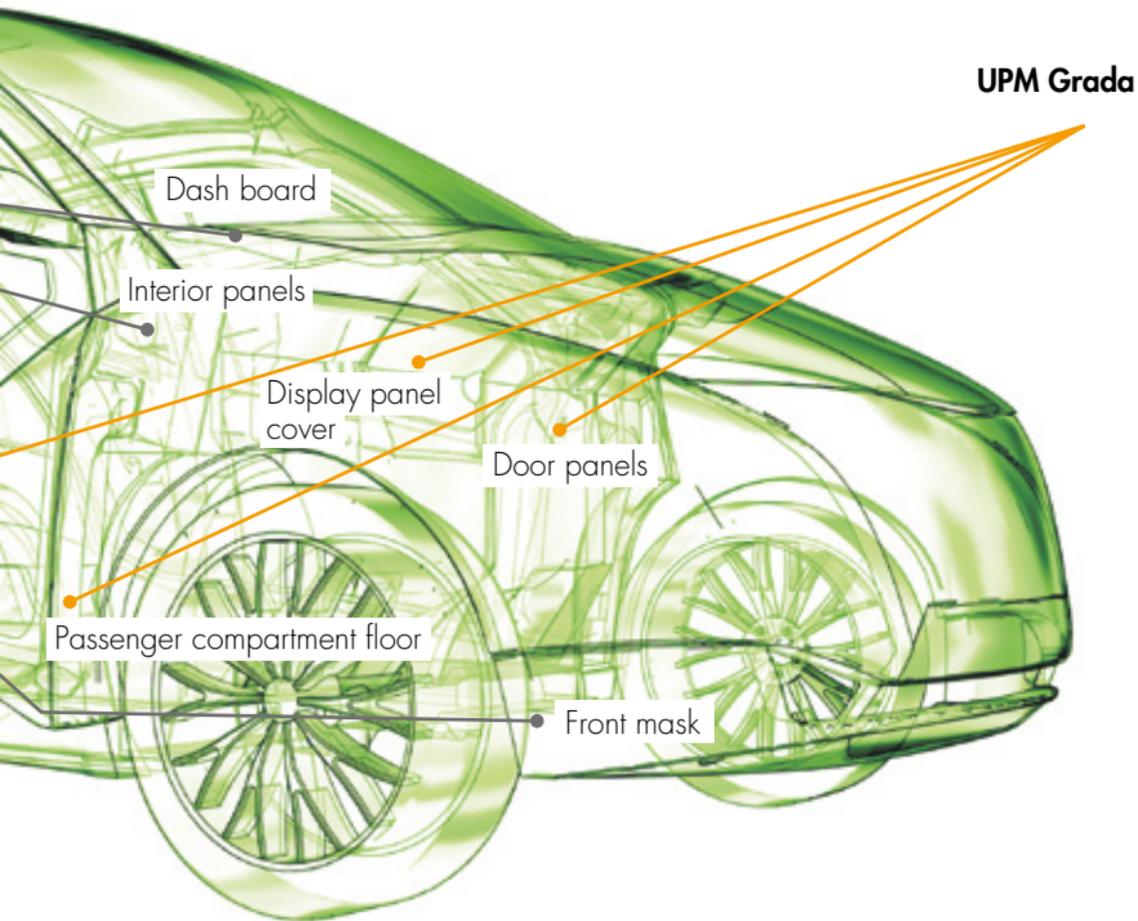
# Biofore in Design

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 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.



**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](http://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](http://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](http://www.upm.com)

## Partners

Aalto University

AGCO Power

All-Plast

BRP Finland

Componeering

Digipolis Kemi Technology Park

Lapland University of Applied Sciences

Outokumpu Stainless

Pilkington Automotive Finland

Premium Sound Solutions

Randax

Rovaniemi Regional Development Agency

Ruukki Metals

Sandvik Mining and Construction

Tampere University of Technology

Tekes

Valtra





[www.upm.com](http://www.upm.com)