



# SUSTAINABLE CAR SOLUTIONS FROM FINLAND

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BUSINESS  
FINLAND

#FINLANDWORKS

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BUSINESS  
FINLAND

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# WHY FINLAND?

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BUSINESS  
FINLAND

#1

THE MOST STABLE  
COUNTRY  
IN THE WORLD

THE FUND FOR PEACE,  
FRAGILE STATES INDEX 2021

#1

NUMBER 1 BUSINESS  
ENVIRONMENT  
IN THE WORLD

GLOBAL INNOVATION  
INDEX 2020

#1

DIGITAL  
COMPETITIVENESS  
IN THE EU

EUROPEAN COMMISSION  
DESI INDEX 2020

#2

MOST SKILLED  
WORKFORCE  
IN THE WORLD

WORLD ECONOMIC FORUM,  
GLOBAL COMPETITIVENESS  
REPORT 2019

#3

MOST INNOVATIVE  
COUNTRY  
IN THE WORLD

BLOOMBERG INNOVATION  
INDEX 2019

#1

LEADING COUNTRY  
IN SUSTAINABLE  
DEVELOPMENT

UN SUSTAINABLE  
DEVELOPMENT  
REPORT 2021

#1

THE HAPPIEST  
COUNTRY  
IN THE WORLD

UN 2020 WORLD  
HAPPINESS REPORT

# SUSTAINABLE CARS AS A WAY OF LIFE

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A sustainable car is the top priority for all major car manufacturers in the world. It is a car that goes beyond a zero-emission electric vehicle. It is sustainable by design, benefiting from highly innovative, renewable and recycled materials. It minimizes CO<sub>2</sub> emissions, and at the end of its life cycle, every component is recyclable or reusable. It provides a new way of life by being both smart and sustainable. Here are a few examples of the actions the automotive industry is taking to move toward a sustainable car.

## TARGETS

- Audi: 30% less vehicle-specific CO<sub>2</sub> emissions by 2025; carbon neutrality by 2050.
- GM: 50% sustainable content by car weight by 2030.
- Volvo: 25% biobased or recycled plastics by 2025.
- Ford: 50% recycled or renewable plastics by 2035.
- Toyota: car life cycle CO<sub>2</sub> emissions 25% less by 2030.
- BMW: car CO<sub>2</sub> emissions 40%+ less by 2030.

## ACTIONS

- BMW: reducing the # of large components to increase recyclability.
- Polestar: no foam in car textiles to increase recyclability.
- Audi: Germany–India collaboration on using recycled batteries for green energy in rural India.
- Mercedes Benz: car body made from bagasse (a fibrous byproduct of sugarcane juice extraction).

## INNOVATIONS

- Recycled PET bottles for interior materials.
- Tree fibers for seats as a leather substitute.
- Spent 3D printer powder for fuel line clips.
- 3D printed lightweight plastic shells and frames.
- Agave fiber for reinforced window mechanisms.
- Plant-based tires from shrubs.
- Carpool app services, eco rideshares and co-ownerships.
- Long-range electric cars, hydrogen cars, solar cars.
- Residential charging stations, solar-powered charging.

# TOWARD A SUSTAINABLE CAR

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## ENGINE ELECTRIFICATION

Solutions (including materials) for engine and power transmission electrification and batteries.

## SUSTAINABLE MATERIALS

Solutions enabling the use of non-fossil -based, renewable, recycled, and/or recyclable materials and sustainable additives in cars.

## RECYCLING AND REUSE OF COMPONENTS

Solutions for end-of-life collection, sorting and separation, recycling, and/or the reuse of all car components, including batteries.

## LIGHTWEIGHT CAR BODIES

Innovative solutions targeting a significant reduction in car body weight, including metal replacement.

## CHARGING INFRASTRUCTURE

All infrastructure-related solutions enabling ecological and efficient electric car charging, including the availability of charging outlets and their ease-of-use.

## THE SUSTAINABLE CAR AS A WAY OF LIFE

Solutions, including mobile apps, enabling the car as a service and car sharing.

## CONNECTIVITY

Infrastructure solutions enabling smart and autonomous cars and car cybersecurity solutions.

# FINNISH STRONGHOLDS

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Finnish companies' competitive edge is based on a globally pioneering position in the circular economy. Innovative and sustainable new materials and composites are created, and at the same, highly advanced recycling solutions are developed. A world-leading position in the production of sustainable wood-based materials, plastic, textile and metal recycling technologies, advanced battery minerals and solutions, and pioneering digital and mobile solutions create the foundation for Finnish competitiveness.

## OUR EXPERTISE

- Material innovations: sustainably produced wood biomass, pulp, and other fibers and composites.
- Advanced mechanical and chemical recycling technologies in plastics, textiles, and metals.
- World-leading battery minerals solutions and high-efficiency battery technologies.
- World-pioneering digital, mobile, and 5G and 6G connectivity solutions.
- Innovative sustainable electric vehicle charging infrastructure solutions.
- Smart vehicles and Mobility as a Service solutions.

## PIONEER IN THE CIRCULAR ECONOMY

- Pioneer ambition: Climate neutral Finland by 2035 based on Finnish strategic program for the circular economy.
- First in the world: roadmap to the circular economy 2016–2025, updated in 2019.
- First in the world: plastics circular economy roadmap 2018, updated in 2022: plastics circular economy by 2030.
- First in the world: National Circular Design Program 2022 for companies.
- Pioneer in sustainable cars: Biofore Concept car—[read more](#).

# WORLD-LEADING RESEARCH AND INNOVATION ECOSYSTEMS

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BUSINESS  
FINLAND

Finland is a pioneer in developing all the technologies required for a sustainable car as a way of life. This capability is based on long R&D traditions and industry-academia innovation ecosystems that create solutions ranging from nano-scale breakthrough materials to pioneering biobased and circular solutions, and to the enablers of high-efficiency, digitalized and smart sustainable cars.



# RESEARCH EXAMPLES

Topic	VTT TECHNICAL RESEARCH CENTRE OF FINLAND	FINNISH ENVIRONMENT INSTITUTE (SYKE)	TAMPERE UNIVERSITY OF APPLIED SCIENCES	LUKE NATURAL RESOURCES INSTITUTE FINLAND
<b>Engine Electrification</b>	<p><b>VOLTCAR:</b> Design, manufacturing, and validation of eco-cycle electric traction motor.</p> <p><b>HiECS:</b> High-Speed Electromechanical Energy Conversion Systems.</p> <p><a href="#">DRIVEMODE</a>: next-generation electric drives.</p> <p><a href="#">SOLiD</a>: develops processing methods for solid-state batteries.</p>			
<b>Sustainable materials and additives</b>	<p><a href="#">HIDDEN</a>: develops self-healing methods to increase the lifetime of Li-metal batteries.</p> <p><a href="#">NextGenBat</a>: develops materials, concepts and processing methods for solid-state batteries.</p> <p><a href="#">Carbon neutrality empowered by handprint</a>: a framework for companies to reliably and credibly show their carbon neutrality and the handprint of circular economy solutions.</p>	<p><a href="#">PlastLIFE SIP</a> – Re-thinking plastics in a circular economy; PlastLIFE promotes the implementation of the Plastics Roadmap for Finland.</p> <p><a href="#">PlastLIFE</a> University of Jyväskylä: works on ecotoxicity and biodegradability to promote safer use of biodegradable plastics as a substitute for conventional plastics.</p>	<p><a href="#">3D Pirkanmaa</a>: a competence center in the Tampere region focusing on promoting industrial additive manufacturing technologies to companies.</p> <p><a href="#">3D MetalPro</a>: pilots for demanding 3D industrial metal printing and testing its suitability for real-life use.</p>	<p><a href="#">Nature2Bond</a> (Biobased sustainable adhesive system for plywood, LVL, and wood-based panels): The solution developed by Luke follows the principles of the circular bioeconomy: Low-value raw materials are processed into high value-added products, and wood panels bonded with new bio-glues are sustainable and environmentally friendly.</p>
<b>Recycling and reuse of components</b>	<p><a href="#">BATTRACE</a>: traceability of battery materials and the production processes.</p> <p><a href="#">Industrial circular economy</a>: circular design: offers a holistic viewpoint for closing, lengthening and redesigning the battery value chain.</p>	<p><a href="#">PlastLIFE Syke</a>: Towards a safe circular economy: safer recycling of plastics.</p>		



# RESEARCH EXAMPLES

BUSINESS  
FINLAND

Topic	VTT TECHNICAL RESEARCH CENTRE OF FINLAND	FINNISH ENVIRONMENT INSTITUTE SYKE	TAMPERE UNIVERSITY OF APPLIED SCIENCES	TURKU UNIVERSITY OF APPLIED SCIENCES
<b>Lightweight car bodies</b>	<a href="#">HiPer</a> : efficient production of strong and lightweight composites with similar mechanical performance to current thermoplastic cut glass fiber composites.			
<b>Charging infrastructure</b>	<a href="#">ASSURED</a> : boosts the integration of urban commercial electric vehicles with a high-power fast-charging infrastructure.			
<b>Sustainable car as a way of life</b>	<a href="#">REFLECTIVE</a> : a novel concept for a distributed and modular fully electric vehicle, combining compact size and design.			<a href="#">E-mobility promotion via V2G solutions in RESPONSE project</a> : Implementation of light electric vehicle charging hub and shared electric vehicles to promote sustainable mobility.
<b>Connectivity</b>			<a href="#">eSmartmachines</a> : networked RDI and Demonstration Testbed for electric intelligent mobile work machines and commercial vehicles.	

# WORLD-LEADING INNOVATION ECOSYSTEMS

## ExpandFibre: accelerating the development of sustainable bioproducts

ExpandFibre (2020–2024) is a €50m R&D collaboration and Ecosystem launched by Fortum and Metsä Group and co-funded by Business Finland. It focuses on upgrading pulp fiber, hemicellulose and lignin from renewable and sustainable sources of straw and northern wood to functional and sustainable new bioproducts such as textiles, packaging solutions and biocomposites.

### EXPANDFIBRE CONNECTS WITH MULTIPLE R&D INITIATIVES BY FORTUM AND METSÄ GROUP

The research and development in ExpandFibre, which aims to produce ground-breaking new technologies and smart business concepts, is divided into seven key research themes: textiles; biocomposites; packaging; lignin products; hemicellulose products; sourcing and fractionation of straw; and other fiber products.

### EXPANDFIBRE CONNECTS WITH MULTIPLE R&D INITIATIVES BY FORTUM AND METSÄ GROUP

Fortum and Metsä Group aim to inspire a larger global ecosystem to join the mission, as ExpandFibre invites actors in the seven key value chains to join in building a world-leading innovation ecosystem to commercialize new bioproducts and green businesses. The ExpandFibre Ecosystem is a unique opportunity to find innovation and collaboration partners, explore new business opportunities, and take part in cross-disciplinary and end-to-end value chain cooperation.

### CONTACT EXPANDFIBRE PROGRAM MANAGERS

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**Metsä Group:** Katariina Kemppainen, VP, Group R&D at Metsä Spring, [katariina.kemppainen@metsagroup.com](mailto:katariina.kemppainen@metsagroup.com), +358 (0)50 375 2212, [www.metsagroup.com](http://www.metsagroup.com)



# WORLD-LEADING INNOVATION ECOSYSTEMS

## BATCircle—circular ecosystem of battery metals

BATCircle2.0 is a Finland-based circular ecosystem of battery metals led by Aalto University. It aims to improve the competitiveness of the Finnish battery metals value chain through high-quality research at the academy–industry interface.

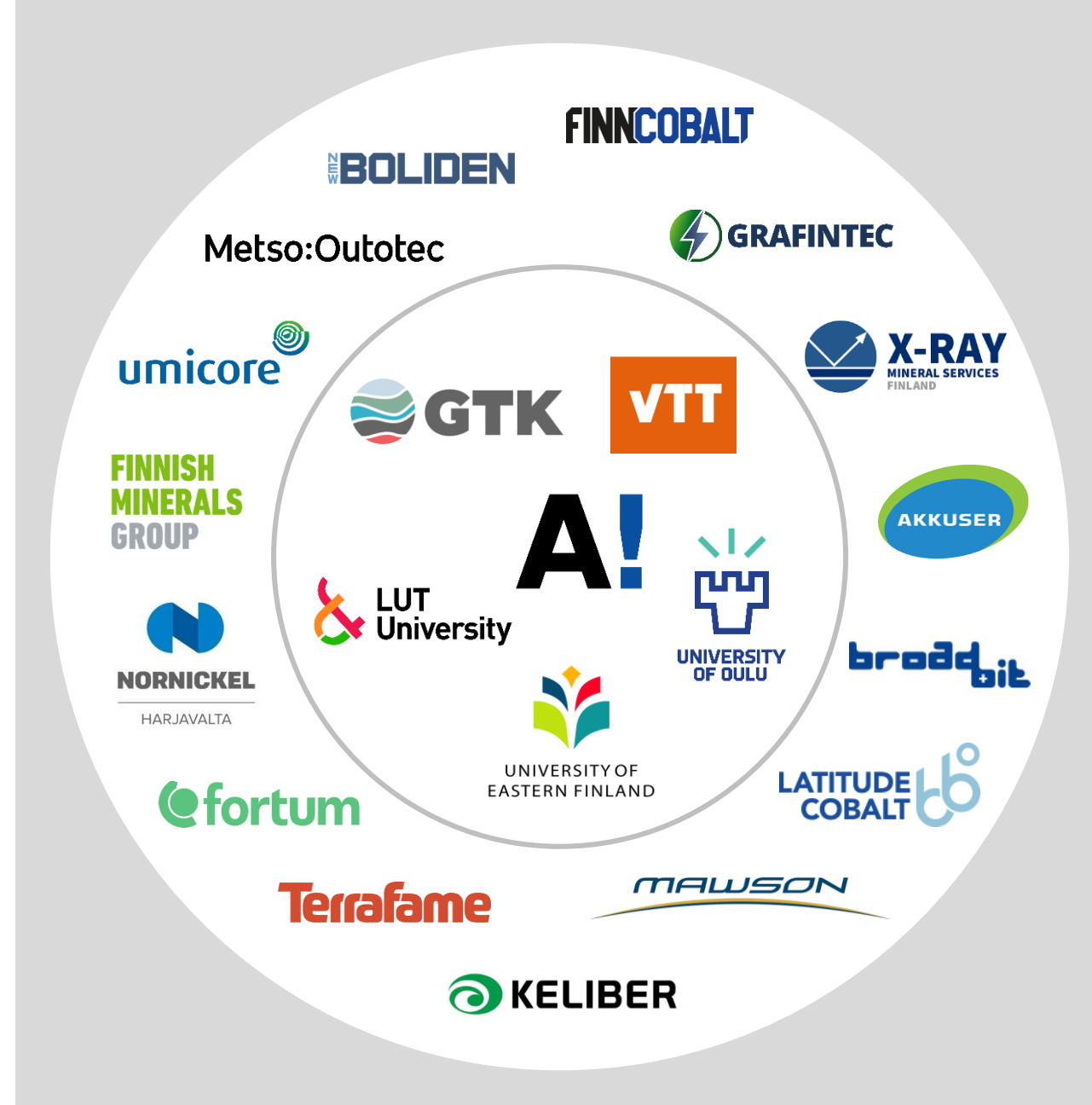
Research includes the entire battery metals value chain, extending from minerals exploration through metals processing to recycling and circular value systems. Sustainability is the key value, which is considered a threshold when manufacturing and recycling materials and metals for batteries and car components.

### OUR ECOSYSTEM

- Covers the entire car/battery metals value chain.
- Has a deep understanding of metallurgical unit processes.
- Has high-level expertise in novel metal/battery recycling research.
- Combines modeling and practical research.
- Has extensive experience of research–enterprise cooperation.

### CONTACT US FOR COLLABORATION

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# SUSTAINABLE SOLUTIONS ON THE MARKET

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BUSINESS  
FINLAND

## ENGINE ELECTRIFICATION

Celltech Solutions  
Valmet Automotive

## SUSTAINABLE MATERIALS AND ADDITIVES

EcopulpFinland  
Finnfoam  
Metsä Group / Metsä Wood  
Nanoksi Finland  
Rester  
UPM Biofuels  
UPM Plywood

## LIGHTWEIGHT CAR BODIES

Addcomposites  
TactoTek

## CHARGING INFRASTRUCTURE

Cation  
Parking Energy  
Unified Chargers

## SUSTAINABLE CARS AS A WAY OF LIFE

Tramigo

## CONNECTIVITY

Basemark  
CTRL Reality  
Deal Comp  
Driveco  
Vaisala  
Wapice

# ENGINE ELECTRIFICATION

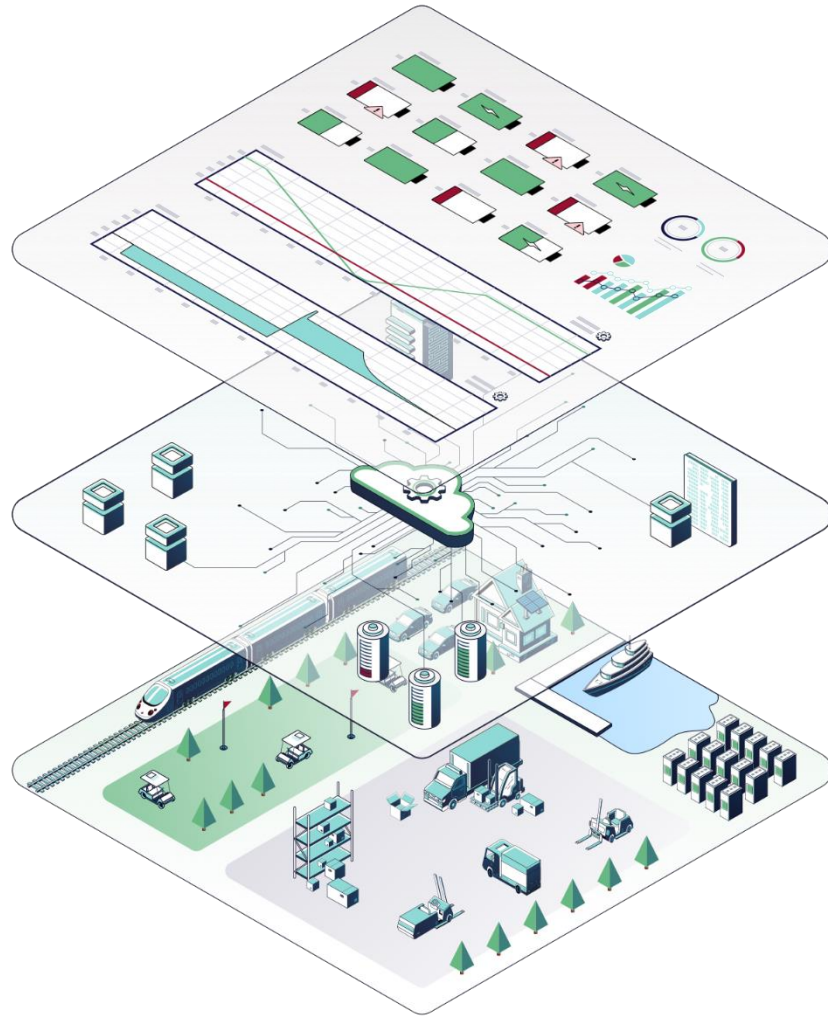
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BUSINESS  
FINLAND

Bamomas

Celltech Solutions

Valmet Automotive



# POWERFUL ANALYTICS FOR INDUSTRIAL BATTERIES

## OUR SOLUTION

The exponential market growth of EV batteries has led to sustainability challenges because current battery use practices are far from sustainable. Industrial batteries are virtual black boxes with no data or traceability available to guide battery stakeholders' managerial and financial decisions. To make battery use safer, smarter and more efficient, Bamomas has developed a cloud battery intelligence platform based on AI and ML powered algorithms. We provide predictive analytics for and insights into the health, use and lifespan of industrial batteries to make their use sustainable.

## BENEFITS FOR THE CUSTOMER

- Manage your fleet through insights into the entire battery asset portfolio, not just a single battery.
- Utilize field data to simulate use and operating conditions for future battery aging and health.
- Automate safety alerts to highlight suspicious behavior and conditions before they become critical.

## COMPETITIVE ADVANTAGE

1. Our solution offers the ability to not just monitor your battery data, but also to analyze it for battery management at a fleet level. 2. We store battery

data on our cloud servers and deploy AI and ML techniques to identify use trends. 3. Our solution is largely battery chemistry agnostic.

## COMPANY

We are a Finnish tech company, specializing in remote battery monitoring and predictive battery analytics. Our IoT and cloud analytics solutions enable the predictive maintenance of industrial batteries and make battery use more economical and sustainable.

## REFERENCES

Our solution has been deployed in different application areas for both mobile and stationary fleets such as Material handling, UPS, Telecom and Golf.

## CONTACT

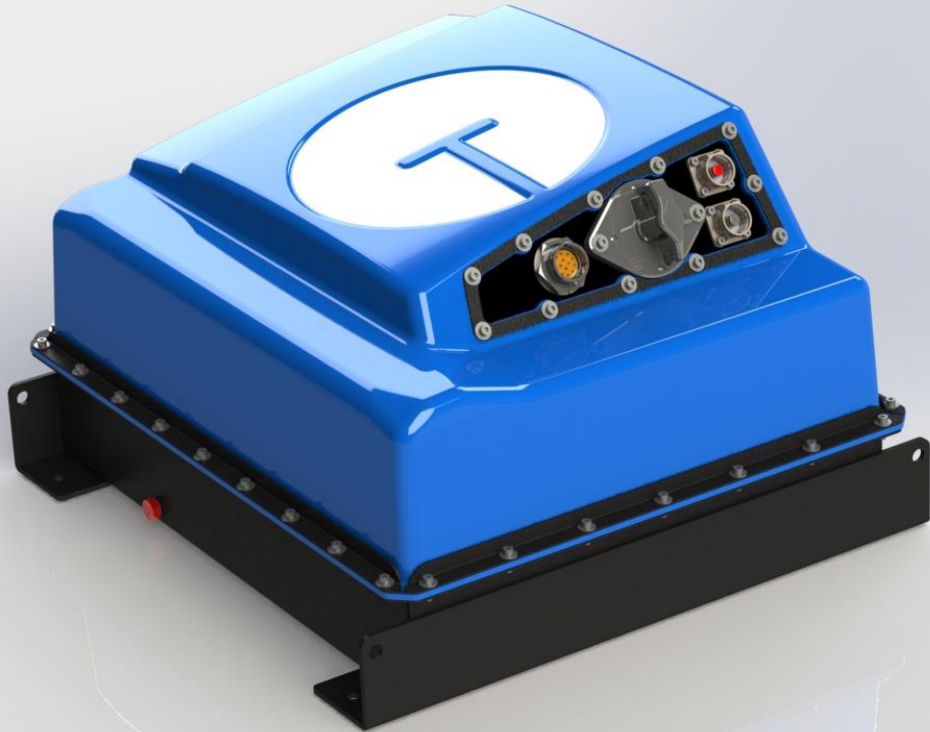
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# BATTERY SYSTEM DESIGN AND MANUFACTURING

## OUR SOLUTION

We design and manufacture battery systems for industrial and special vehicles. We already have many customer cases with global leading companies in the industrial machinery business segment. With our more than 30-year history of working with battery systems and strong financial position, we can handle large and difficult projects efficiently and with high quality. We aim to continue to be a trusted battery system partner for our customers for decades.

## BENEFITS FOR THE CUSTOMER

- We have a long history of working as a long-term key partner in our customers' demanding battery solutions.
- We understand our critical role and have decades long customer relationships to prove we can be trusted.
- With our own product development and production, we can offer the best possible solutions for our customers now and in the future. We have a financially strong position and can handle rapid short- and long-term business growth.

## COMPETITIVE ADVANTAGE

We have designed three different battery system platforms that cover most of our customers'

requirements in the 24–800V range. From these existing platforms, we can finalize the most suitable customer-specific solution in the most cost-effective way and the shortest possible project time.

## COMPANY

Celltech has been designing and manufacturing customer-specific batteries and battery systems for 30 years. We partner with all major industrial companies in the field of batteries worldwide—for example, cell manufacturers.

## REFERENCES

We work with many industrial device and machine manufacturers that are global leaders in their market area. We support them at the global scale.

## CONTACT

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# VALMET AUTOMOTIVE ELECTRIFIES THE ROAD AHEAD

## OUR SOLUTION

The automotive industry is facing today's technology-driven trends. Electric mobility has already been at the core of Valmet Automotive's strategy for more than a decade. This makes us a pioneer in the field. In all our business lines, electric mobility and electric drivetrains play a leading role. We meet OEMs' increasing need for efficient battery systems and production capacity of cell modules and battery packs across the value chain, including complete solutions from concepts, engineering, prototypes, testing, validation and manufacturing to serial supply.

## BENEFITS FOR THE CUSTOMER

- Competence and experience in developing highly efficient battery systems.
- Efficient and reliable inhouse testing and validation.
- Speed and cost-effectiveness in ramping up production.

## COMPETITIVE ADVANTAGE

Valmet Automotive has been CO<sub>2</sub> neutral since January 1, 2022, in its own operations. We offer a complete value chain coverage and have the capability of producing cars and batteries under one roof.

Our outstanding flexibility and decades-long manufacturing expertise are highly acknowledged by renowned OEMs.

## COMPANY

The Valmet Automotive Group is a leading European manufacturer of electric vehicle battery systems and automotive kinematic systems for OEMs, as well as being one of the largest vehicle contract manufacturers in the world.

## REFERENCES

Mercedes-Benz cell modules and batteries, Volvo Cars Plug-in Hybrid battery.

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# SUSTAINABLE MATERIALS AND ADDITIVES

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BUSINESS  
FINLAND

EcopulpFinland

Finnfoam

Metsä Group / Metsä Wood

Nanoksi Finland

Rester

UPM Biofuels

UPM Plywood



# SUSTAINABLE PACKAGING FOR CAR COMPONENTS

## OUR SOLUTION

Ecopulp Finland Oy develops, designs and produces 3D-shaped solutions and protective packaging from recycled paper or wood fiber. Ecopulp applications are always very environmentally friendly because the material is biodegradable and 100% recyclable. The total carbon footprint of recycled fiber-based products is lower than in any other material with a similar intended use. Ecopulp protective packaging is perfect for the transportation of spare parts and other components.

## BENEFITS FOR THE CUSTOMER

- Products are fully biodegradable and recyclable
- Components will decrease total carbon footprint
- Products replace plastic solutions

## COMPETITIVE ADVANTAGE

100% recyclable protective packaging for car components in transportation is the most sustainable supply chain, including waste

management and fees with packaging materials. Condensation/moisture problems do not arise with fiber-based products as they do with plastic-based packaging.

## COMPANY

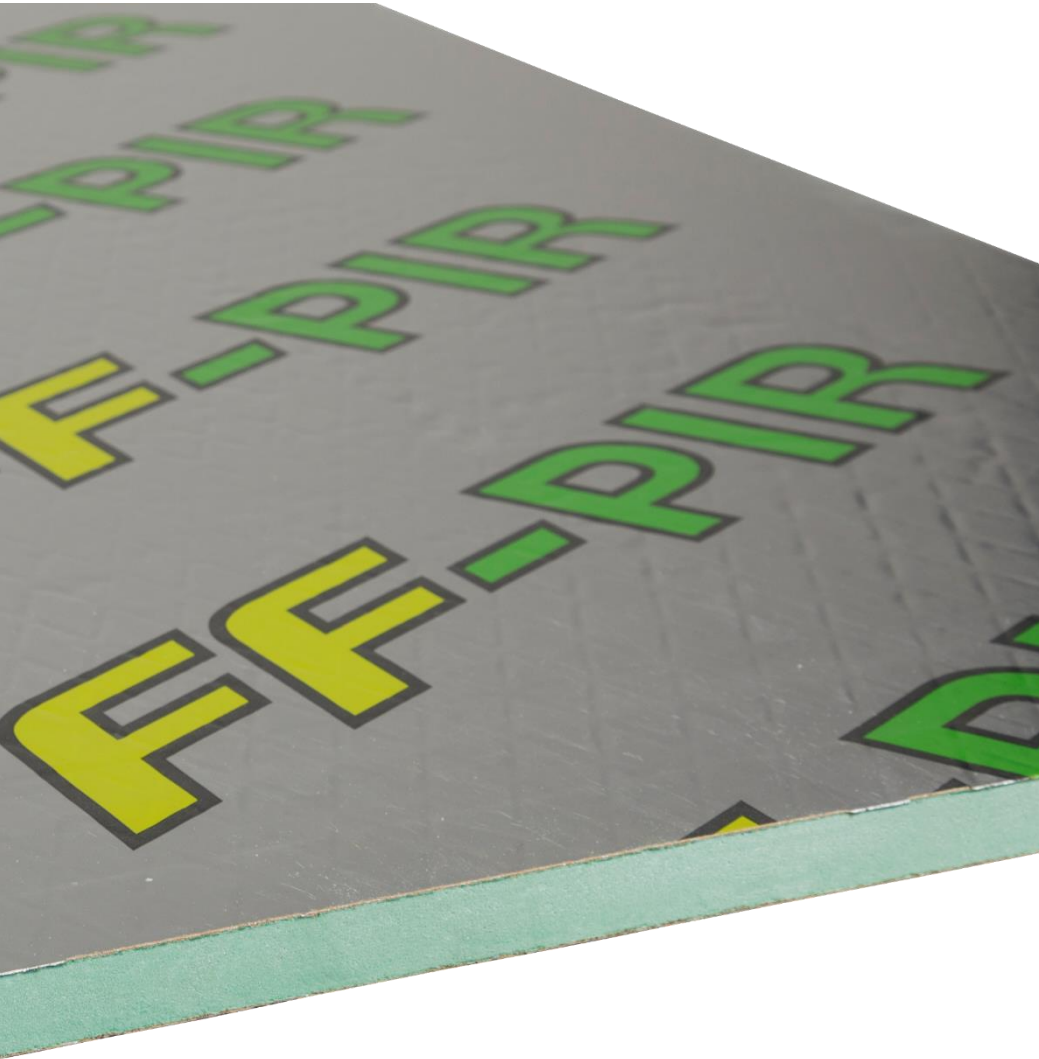
Ecopulp minimizes the environmental effect in its own production with green and recovery energy and closed water circulation. ISO 9001 and ISO 14001 apply. Remarkable investments were made in 2020 and 2022 in new production, energy savings and quality.

## REFERENCES

ABB, Oras Geberit, Alko, Abloy

## CONTACT

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# INSULATION MATERIALS

## OUR SOLUTION

Effective insulation materials and energy-efficient solutions are reducing trucks' and buses' carbon footprint throughout their life cycles. They also greatly reduce owners' energy use and costs.

## BENEFITS FOR THE CUSTOMER

- Energy efficiency
- Lower usage costs

## COMPETITIVE ADVANTAGE

Finnfoam has several innovative and energy-efficient insulation solutions. The latest solutions all use recycled raw materials, and the aim of R&D has already been to reduce products' carbon footprint for more than 5 years. Finnfoam is also developing bioplastics from waste base raw materials.

## COMPANY

Over its forty-year history Finnfoam has become one of the leading manufacturers of plastic-based thermal insulation solutions in Scandinavia. It is our vision to be a safe Finnish trailblazer in ecological construction.

## REFERENCES

Truck manufacturers are already currently using Finnfoam (XPS) and FF-PIR insulation materials.

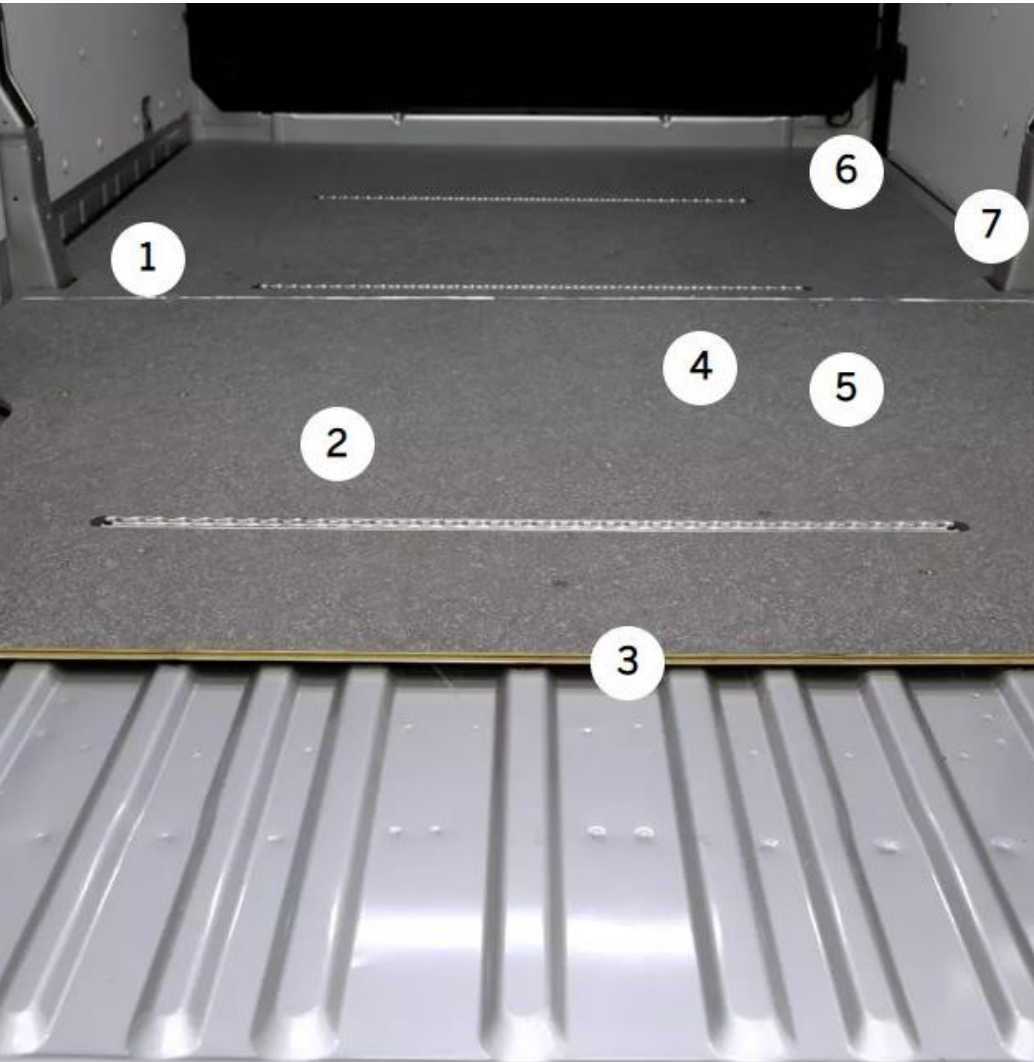
## CONTACT

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# METSÄ WOOD BIRCH PLY FOR TRANSPORTATION INDUSTRY

## OUR SOLUTION

Metsä Wood's long tradition of plywood manufacturing and transportation industry cooperation sets high standards for plywood products and services. Metsä Wood is a proven and reliable partner for your business development needs. Metsä Wood is proud to present a large portfolio of plywood products and services for a wide range of end uses in the transportation segment. The use of technically superior Northern wood material allows the optimization of the use of wood to produce economical components with excellent strength properties.

## BENEFITS FOR THE CUSTOMER

- Sustainable wood products
- Variety of surfaces and colors with tailor-made components
- Excellent strength-to-weight ratio

## COMPETITIVE ADVANTAGE

Metsä Wood Birch Ply products serve sustainable wooden products for the following transportation areas:

- > Heavy trailers
- > Delivery vans and light trailers
- > Passenger transportation (trains and busses)

## COMPANY

Metsä Group/Metsä Wood. Metsä Wood is proud to present a large portfolio of plywood products and services for a wide range of end uses in the transportation segment. Metsä Wood has long experience of manufacturing transportation industry products.

## REFERENCES

Please look at the references on our [webpage](#).

## CONTACT

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# ANTIMICROBIAL COATING FOR CAR INTERIORS

## OUR SOLUTION

To provide an invisible 12-month protective layer in all vehicle interiors that kill all virus and bacteria 24/7 using any available light. Especially on high-touch surfaces, users frequently touch the steering wheel, dashboard and door handles. Coating the windows, seats and other areas prevents smells by destroying microbial growth and volatile organic compounds.

## BENEFITS FOR THE CUSTOMER

- Safe to touch car interiors, virus- and bacteria-free
- Better smell and air quality
- Sustainable, non-chemical

## COMPETITIVE ADVANTAGE

Fotonit® coating has no bio-codes or harmful chemicals, so it will reduce the carbon handprint of the end user. It works constantly under any light wavelength—currently the only product on the market that can do so.

## COMPANY

Nanoksi Finland provides multifunctional coating services to the B2C, B2B and B2G market as a service. Plasmonics Oy, a spin-off from Tampere University, was acquired in early 2022. Plasmonics is the R&D and production arm of the Group.

## REFERENCES

Emirates Airlines buses and limousines, the tramway in Tampere City, buses in Turku City, Viking Glory, Turku.

## CONTACT

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# RECYCLED FIBER MATERIAL FOR INDUSTRY

## OUR SOLUTION

We provide high-quality recycled raw material from known sources. We work with businesses to recycle their textile materials and only process clean and known materials. Our sustainability is based on considering end-of-life textiles as a source of raw material that with the right process can be returned to use, replacing virgin materials. This brings significant CO<sub>2</sub>, land and water use reductions for which we also provide calculations. Our manufacturing process is chemical- and water-free, and our added input to the material production emissions is thus very limited.

## BENEFITS FOR THE CUSTOMER

- Reliable price and source. Our long-term contracts help deliver reliability in supply and price
- High-quality recycled material from known B2B supplying customers. Every ton replaces new virgin materials.
- Provide a service through partners to make felts, insulation, anti-vibration mats, yarn, fabric etc.

## COMPETITIVE ADVANTAGE

Our differentiators are accountability and high quality. We track the source for both inbound and outbound streams and provide calculations and guarantees for them. We are highly flexible and work with clients, involving partners to closed loops and find the best possible home for the materials.

## COMPANY

A unique textile material recovery company providing high-quality fibers and product development with clients. Processing the end of life for all common textile materials and serving the whole of Europe in both recycling and raw material sales.

## REFERENCES

Freudenberg Group, Marimekko, Lindström, Södra Sporda.

## CONTACT

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# UPM BIOVERNO NAPHTHA —WOOD REPLACES PLASTIC

## OUR SOLUTION

Many components which require plastics are used in car interiors. We help you switch these usually fossil-based plastics to a more sustainable solution made from UPM BioVerno naphtha. UPM BioVerno is a drop-in bio-feed sourced from crude tall oil, a wood-based residue of the pulp making process. Put simply, it is a true product of the circular economy. UPM BioVerno naphtha can be used in all the chemical industry solutions in which fossil-based naphtha is used. UPM BioVerno naphtha is fully compatible with existing production and recycling infrastructures.

## BENEFITS FOR THE CUSTOMER

- Our products help reduce the carbon footprint significantly compared to fossil alternatives
- Ideal for replacing fossil raw materials in innovations from synthetic leathers to car dashboards
- UPM BioVerno's renewable raw material is crude tall oil, a residue of the pulp making process

## COMPETITIVE ADVANTAGE

Every ton of UPM BioVerno used saves three tons of carbon dioxide emissions compared to fossil

raw material. It has all the usual benefits of plastic—durability, flexibility and recyclability. It is the purer solution whenever plastic is required, such as for different car components.

## COMPANY

UPM Biofuels produces renewable and sustainable products for the transportation and petrochemical industries. We offer our customers ways to replace fossil raw materials and reduce their carbon footprint with wood-residue-based UPM BioVerno naphtha.

## REFERENCES

UPM BioVerno naphtha has been used in various end products—for example, in a biobased PVC plastic called Biovyn produced by Inovyn.

## CONTACT

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# TRAILERS, TRUCKS AND REFRIGERATED BODIES

## OUR SOLUTION

Strong and durable plywood products and a wide product portfolio provide the best solution for trailer and light commercial vehicle manufacturers. Plywood is used as structural flooring material, delivered as assembly-ready plywood components in trailers, refrigerated bodies and light commercial vehicles. Birch plywood's excellent strength-to-weight ratio means more payload and less fuel. It is therefore also a sound ecological choice.

## BENEFITS FOR THE CUSTOMER

- Lower dead weight, providing a higher payload and lower fuel consumption
- Install-ready plywood components make factory assembly quicker
- Maxi-sized panels provide a one-piece seamless flooring solution

## COMPETITIVE ADVANTAGE

Commercial vehicles require lightweight and durable non-slip flooring materials. Special

wear-resistant coatings prolong the service life of vehicles using WISA plywood panels. A wide range of sizes and customized panel components save you time and money.

## COMPANY

UPM Plywood sells plywood and veneer products under the registered trademark WISA®. UPM Plywood is a part of UPM. As the frontrunner in the forest industry, UPM is leading the integration of the bio and forest industries into a new and sustainable future.

## REFERENCES

Schmitz, Krone, Sortimo and Wielton.

## CONTACT

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<https://www.wisaplywood.com/applications/vehicle-flooring>

**UPM**PLYWOOD





# LIGHTWEIGHT CAR BODIES

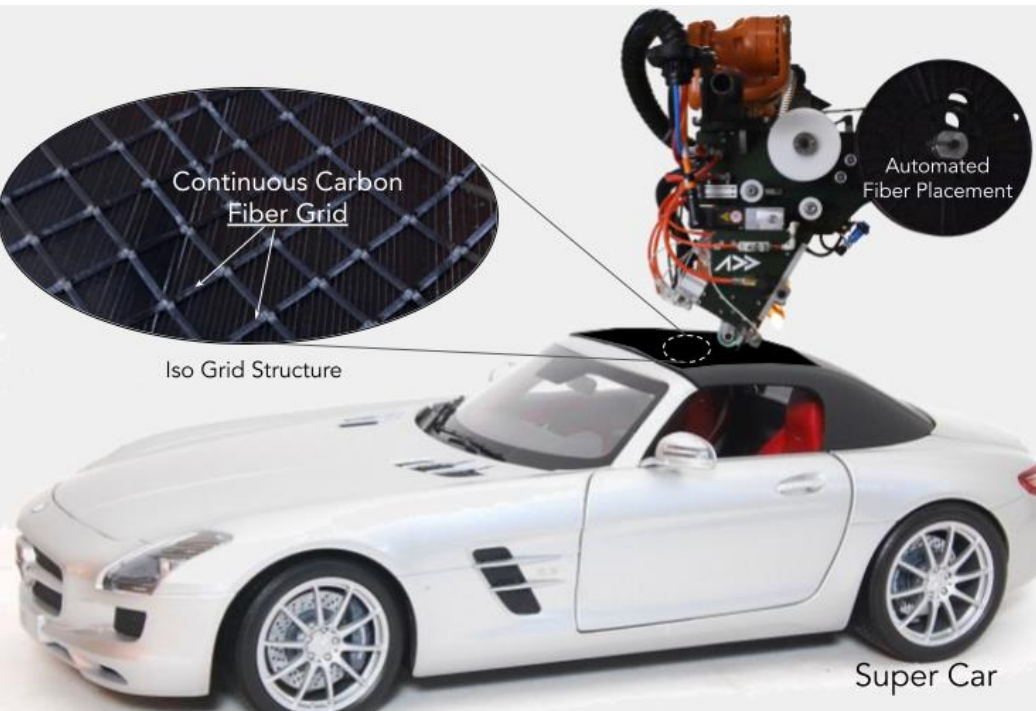
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BUSINESS  
FINLAND

Addcomposites

TactoTek





# COMPOSITES BODY AND STORAGE PARTS

## OUR SOLUTION

We provide automated manufacturing solutions for car bodies and hydrogen tank storage solutions.

## BENEFITS FOR THE CUSTOMER

- Automated production
- Lightweight additive manufacturing structure
- High-capacity hydrogen storage solution

## COMPETITIVE ADVANTAGE

High-performance structure with high customization for user experience.

## COMPANY

We are a solution provider for lightweight additive manufacturing solutions based in Helsinki.

## REFERENCES

We have dozens of systems across the world in the aerospace and space industry.

## CONTACT

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## IMSE®—LET SMART SURFACE™

### OUR SOLUTION

With Injection Molded Structural Electronics (IMSE®) technology, vehicle occupants can expect the interiors of the future to be more spacious, more functional, and more dedicated to the comfort and wellbeing of passengers. An IMSE product requires fewer parts and less plastics than conventional methods, leading to a reduced environmental impact across the lifecycle. Its additive manufacturing processes lead to reduced assembly and 80% fewer manufacturing tools. Benefiting from reduced material use, smart surfaces are up to 70% lighter in mass, leading to significant lifetime GHG reductions.

### BENEFITS FOR THE CUSTOMER

- IMSE® structures are thinner, lighter and more durable than conventional electronics
- Environmentally conscious: IMSE technology produces 60% less GHG emissions from cradle to gate
- Better user experiences with significantly improved environmental performance

### COMPETITIVE ADVANTAGE

IMSE® structures are thinner, lighter and more durable than conventional electronics

for comparable use cases. Previously bulky devices can be reshaped or integrated into the holistic structure to open up new design languages, while reducing the space and weight needed for added functionality.

### COMPANY

TactoTek develops and licenses injection-molded smart structure technologies, enabling brands to create sustainable, differentiated and compelling user experiences. The company is represented on three continents with 100 employees. Its HQ is in Finland.

### REFERENCES

TactoTek cooperates with several industry leaders, serving the automotive sector globally.

### CONTACT

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# CHARGING INFRASTRUCTURE

---

Cation

Parking Energy

Unified Chargers

BUSINESS  
FINLAND



# eCHARGIE—SUSTAINABLE EVCHARGING SOLUTIONS

## OUR SOLUTION

Our eCharge device is unique, patented and especially suitable for housing cooperatives. It is easy to set up, easy to use, and easy for decision making in housing cooperatives. It is mobile, wireless, and includes smart technology which enables automatic temperature control of the devices, dynamic load management, and automatic payment transactions. All this can be done without extensive construction work in the yard area of the housing cooperative. Above all, this is a superior competitive advantage in the market.

## BENEFITS FOR THE CUSTOMER

- Scalable: Electric vehicle charging can be provided to anyone in the housing cooperative purchasing an electric vehicle.
- Easy: All the data connections are included in eCharge. There is no need for data cabling or WiFi in the parking area.
- Cost-effective: eCharge is plugged into an existing socket in a carport or electricity pole, for example. This can be done without extensive construction work in the yard area of the housing cooperative.

## COMPETITIVE ADVANTAGE

It is easy to set up, easy to use and easy for decision making in housing cooperatives. It is mobile, wireless, and includes smart technology which enables automatic temperature control, dynamic load management and automatic payment transactions.

## COMPANY

Cation Oy is a high-growth company founded in 2017 with a business idea that aims to utilize the existing infrastructure of a housing cooperative in electric and hybrid vehicle charging.

## REFERENCES

Caruna Oy, Espoo Ruka Suites, Kuusamo, Tampere Adult Education Centre, SASKY Municipal Education and Training Consortium, The City of Nokia, Salo IoT Campus.

## CONTACT

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# PARKING ENERGY

## OUR SOLUTION

Parkkisähkö is a Finnish growth company. We are a leading real estate charging pioneer worldwide. A cabling system based on patented quick-connect technology, intelligent charging devices and our comprehensive back-end system creates the basis for a safe and long-term solution for all properties and property owners. As electric cars become more widespread, comprehensive charging capability combined with a flexible service model will increase the value of individual homes and properties, while minimizing the current need for investment.

## BENEFITS FOR THE CUSTOMER

- Easy to install, replace or upgrade.
- Most cost-effective solution on the market.
- Our new 2x22kW charger is the best in its class.

## COMPETITIVE ADVANTAGE

Structured EV cabling solutions. Smart EV chargers as-a-service. Dynamic load balancing and energy management. Flexible back-office and billing systems.

## COMPANY

Parking Energy is a Finnish growth company founded in 2014 that develops charging technology for electric cars and provides charging services.

## REFERENCES

Several construction companies, parking operators, real-estate owners and housing associations.

## CONTACT

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## SCALABLE & INTELLIGENT DC CHARGING SOLUTIONS

### OUR SOLUTION

Unified Chargers (UC) produces advanced DC charging stations for public and commercial charging. We offer intelligent and scalable DC solutions for both destination and high-power charging needs. Due to an adaptive voltage range of 200–1,000V our DC stations are suitable for both EVs and e-trucks simultaneously. When necessary, API & OCPP interfaces enable integration with CPO's existing back-end systems. Alternatively, UC stations can be equipped with bank card readers—no identification, no tags, no apps, open for anybody—offering easy contactless payment. If required, we offer white label solutions.

### BENEFITS FOR THE CUSTOMER

- Compact and modular DC charging station. Delivered ready for use. Easy installation and commissioning
- Scalable DC solution with Intelligent power distribution and dynamic load management.
- Flexible integration with existing back-end systems via API and OCPP.

### COMPETITIVE ADVANTAGE

Multiple DC stations can be paired in an intelligent charging field with HPC capabilities and availability

of simultaneous DC charging for dozens of EVs. Intelligent power distribution optimizes the use of power connection, minimizes waiting times and maximizes sold energy and customer satisfaction.

### COMPANY

Unified Chargers is a hi-tech Company originating from Aalto University and now part of Enersense Group. UC specializes in manufacturing advanced DC fast charging stations. Our vision is to provide the best and latest technology and services for public and professional EV charging.

### REFERENCES

Over 40 customers in logistics, transportation, energy and retail, recreation, accommodation, etc. Installation base of ~250 charging stations.

### CONTACT

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[Enersense - creator of zero emission energy solutions](#)

# SUSTAINABLE CAR AS A WAY OF LIFE

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Tramigo

BUSINESS  
FINLAND





# DEMOCRATIZING ROAD SAFETY UPGRADE OF ANY CAR

## OUR SOLUTION

Tramigo's solutions enable upgrades of existing vehicle fleets with a retrofitted IoT solution. The truly complete end-to-end IoT solution includes hardware, software and multi-network connectivity. The solution brings e.g., tracking, fleet optimization, theft protection, driving behavior measurement and fuel management to any vehicle. The technology is also perfect for OEMs and vehicle finance companies in enabling more affordable access to mobility with e.g., collateral use.

## BENEFITS FOR THE CUSTOMER

- Complete solution.
- Cost savings.
- Great service and support.

## COMPETITIVE ADVANTAGE

Tramigo's solution is truly complete and developed inhouse. On top of hardware and software (which competitors call the "whole solution"), we offer multi-network connectivity, meaning we have

2–5 operators simultaneously in every country. Easier onboarding, mission-critical coverage.

## COMPANY

Tramigo is a privately owned IoT company with industry unique knowledge of combining embedded IoT connectivity with hardware and software with multi-network, cross-border seamless operability. The Group has operations and sales on every continent.

## REFERENCES

OEMs: Scania; BMW; Mitsubishi; several logistics companies; vehicle financing and leasing companies.

## CONTACT

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# CONNECTIVITY

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BUSINESS  
FINLAND

Basemark

CTRL Reality

Deal Comp

Driveco

Vaisala

Wapice





# SUSTAINABLE AUTOMOTIVE SOFTWARE SOLUTIONS

## OUR SOLUTION

Vehicle manufacturing today is tough on the environment. Producing the around 100 chips needed for one car consumes more than 4,500 liters of water, in addition to the substantial amount of fossil fuel used in chip manufacturing. The transformation to software-defined vehicles will have a positive impact on the environment as the number of chips is expected to reduce significantly. We support OEMs & Tier1 suppliers in accelerating the development toward a more sustainable automotive industry by offering innovative software solutions that support the development of software-defined vehicles.

## BENEFITS FOR THE CUSTOMER

- Reduces the number of chips needed in vehicles.
- Reduces vehicle power consumption by making more efficient use of chips.
- Reduces the number of vehicles needed by accelerating the path toward software-defined vehicles.

## COMPETITIVE ADVANTAGE

Basemark has unique competence in real-time graphics engine and compute programming. Our

Rocksolid Core platform enables simultaneous graphics and compute operations on a single device. This removes the need for separate processors for ADAS functions and HMI. Easier onboarding, mission-critical coverage.

## COMPANY

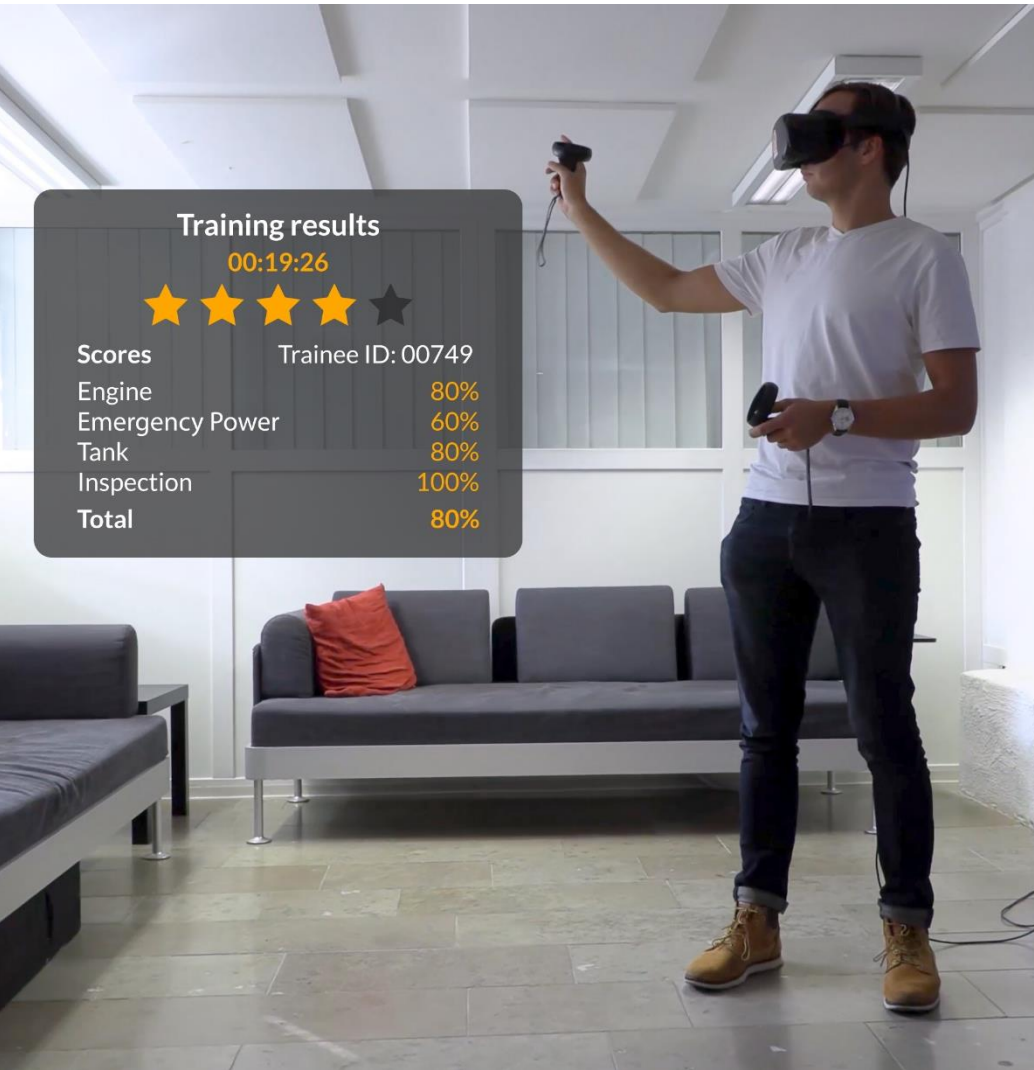
Basemark has been a pioneering provider of automotive software solutions and professional services since 2015. Headquartered in Helsinki and with subsidiaries in Germany and the USA, Basemark today employs more than 80 international professionals.

## REFERENCES

BMW: Video AR navigation implementation; Renault: Winner of "BYOD 2022"; automotive software service projects with OEMs (brand names cannot be disclosed).

## CONTACT

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# SUSTAINABLE VR EMPLOYEE TRAINING

## OUR SOLUTION

In virtual reality, you can undergo many different types of training scenarios. VR training is most suitable for processes that take a long time to master and have many complex phases. Learning how to assemble a car or operate advanced machinery are great examples of this. VR Training is immersive, effective and above all a very sustainable way of learning. The training scenario can be repeated as much as necessary without the need for travel or production stoppages.

## BENEFITS FOR THE CUSTOMER

- Research suggests that memory retention after a VR experience is higher than after viewing video- or text-based learning materials.
- VR training can be repeated as much as required to ensure the best performance. Carefully selected gamification elements keep trainees motivated time and time again.
- Mistakes can be hazardous and can cause unexpected costs. In VR, you can make all the mistakes you want with zero risk.

## COMPETITIVE ADVANTAGE

CTRL Reality is a proud university spinoff using research-proven methods and the latest technology. The company has an extensive background in virtual reality and has developed its VR Training solutions accordingly.

## COMPANY

CTRL Reality is a mixed reality solution provider. Its mission is to improve its customers' performance with advanced mixed reality solutions and to be known as the company with the most satisfied customers.

## REFERENCES

TTS (Työteho-seura), Linde, Varia, Aboa Mare, Wärtsilä and many more! For more info: <https://ctrlreality.fi/hands-on-training>

## CONTACT

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# FAST AND RELIABLE 5G DATA CONNECTIONS

## OUR SOLUTION

DEAL COMP offers innovative connectivity and data-processing edge solutions for in-vehicle and mobile applications for cars, buses and railroad transportation, public safety, logistics and smart cities, for example. A multiprocessor platform for solutions that utilize automatic operation and driving. Vehicle, rail traffic and work machine approved 5G routers and computers.

## BENEFITS FOR THE CUSTOMER

- Lower power consumption than traditional solutions.
- Maximum utilization of mobile networks.
- A fast and flexible partner for developing new solutions according to your needs.

## COMPETITIVE ADVANTAGE

Our paradigm experience and R&D capabilities in complex rugged embedded systems design and leading wireless and connectivity technologies in 5G, BLE, V2X, lower-power CPU technology and system integration give us the ability to address a wide scope of IoT edge projects.

## COMPANY

Deal Comp is a highly skilled partner for technology-based companies, providing services for autonomous driving and operations, embedded solutions, wireless communications, IoT and real time applications with an emphasis on demanding environments.

## REFERENCES

Edge computers and 5G modems for SW companies developing autonomous/automatic driving.  
Computers and 5G routers for autonomous/automatic vehicles.

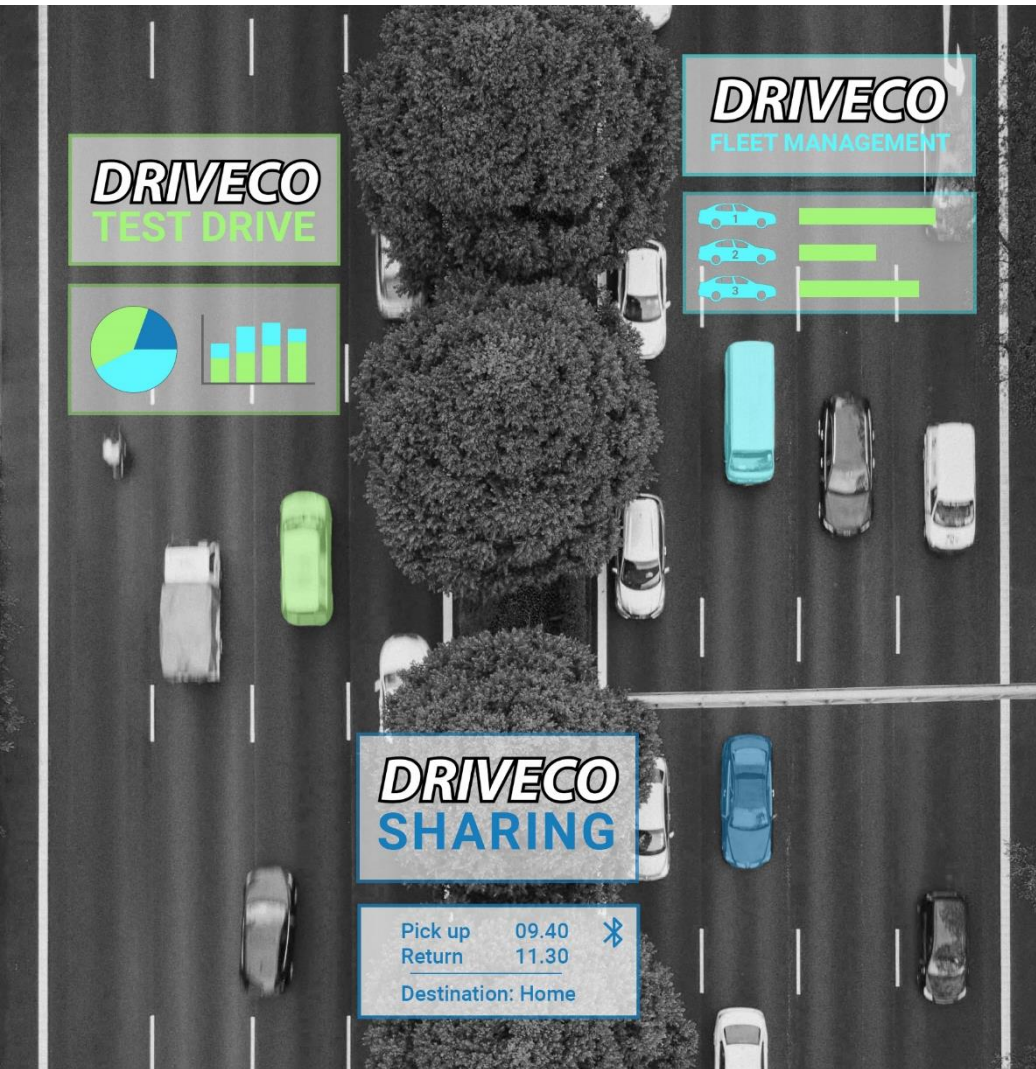
## CONTACT

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## SALES & MARKETING SOLUTION FOR ELECTRIC VEHICLES

### OUR SOLUTION

Driveco AcceleRate is a sales and marketing tool for automotive OEMs which enables the salesperson to use the customer's test drive data to bring forward and convince the customer of the positive aspects of the hybrid/electric test drive vehicle. It thus makes the test drive experience more interesting and allows it to be shared on social media. An excellent tool for building brand awareness of the electrified product line.

### BENEFITS FOR THE CUSTOMER

- Improves CX of test drives.
- Improves sales conversion as a support system for the salesperson to utilize.
- Increases number of test drives, as real-life driving data can be utilized for marketing.

### COMPETITIVE ADVANTAGE

Several OEMs and OEM distributors rely on Driveco's expertise in EV data monitoring, processing and visualizations. OEMs know Driveco can help them explain the vehicle technology, and highlight

the tangible benefits of the technology, which can result in **BETTER SALES CONVERSION AND MORE TEST DRIVES.**

### COMPANY

Driveco works for greener mobility, as we focus our efforts on providing cutting-edge solutions for electrified new vehicle sales, greener fleet management and car sharing. Driveco is an expert in telematics data from alternative fuel vehicles.

### REFERENCES

Audi, BMW, Hyundai, KIA, Lexus, Mazda, Mercedes-Benz, MG, Mitsubishi, Renault, and Toyota distributors in more than 40 global markets.

### CONTACT

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# MAKE EVERY JOURNEY SAFER AND MORE EFFICIENT

## OUR SOLUTION

As our world faces urgent climate challenges, it's more important than ever to base decisions on accurate data. Vaisala provides environmental insights to make every journey more efficient. Vaisala is improving the availability of ADAS and AD systems in all weather conditions. We provide accurate weather, road weather, and air quality data for connected and autonomous vehicles. The quality of our roads impacts the amount of fuel we use. We offer automated mapping and the classification of road defects. We provide decision support tools for sustainable traffic management and road maintenance.

## BENEFITS FOR THE CUSTOMER

- Increase the availability of AD and ADAS functionality with hyperlocal road surface state insights.
- Improve safety, efficiency, and awareness with timely info about weather and driving conditions.
- Improve electric vehicle efficiency with weather-aware systems and navigation.

## COMPETITIVE ADVANTAGE

With more than 85 years of experience and innovation, Vaisala has a unique portfolio of capabilities.

Our end-to-end solutions span reference-grade measurement hardware and sensors to predictive data-as-a-service powered by one of the world's most accurate weather and environment models.

## COMPANY

Vaisala provides observations for a better world. As a global leader in weather and environmental measurements, Vaisala helps customers find answers and take action for a sustainable future.

## REFERENCES

Our customers include BMW, Bosch, Hyundai, Mercedes-Benz, TomTom, and Volkswagen Group. We serve OEMs, suppliers, software developers and more.

## CONTACT

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# VAISALA



## WE ENABLE SUSTAINABILITY THROUGH DIGITALIZATION

### OUR SOLUTION

Wapice is a Finnish high-tech software company specializing in IoT and AI systems, as well as broader digitalization services. We are developing cloud, AI and mobile solutions suitable for e-mobility service providers, cities and transportation companies.

Our offering portfolio includes IoT, AI and cloud solutions, mobile applications, and software development services. Our solutions help cities improve their traffic infrastructure and reach their strict environmental targets.

### BENEFITS FOR THE CUSTOMER

- Ability to always see the big picture of the entire charging fleet, regardless of its data ecosystems.
- Optimizes utilization, operation and maintenance.
- Ready-to-use IoT and AI platform makes it possible to plan for infrastructure investments, monitor the utilization rate and find an intact charging station.

### COMPETITIVE ADVANTAGE

The ability to quickly deliver new services is a key requirement when building applications for today's needs. Our low-code/no-code toolkits guarantee ease of use, a fast time to market and reactivity, keeping you one step ahead of your competitors.

### COMPANY

Established in 1999, Wapice employs more than 340 software and electronics experts at 10 offices in Finland. We are an ISO 9001:2015-, ISO 14001:2015- and ISO/IEC 27001:2013-certified company.

### CONTACT

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# SUSTAINABLE SOLUTIONS ON THE MARKET WITHIN 6-12 MONTHS

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BUSINESS  
FINLAND

## ENGINE ELECTRIFICATION

Battery Intelligence  
Valmet Automotive

## SUSTAINABLE MATERIALS AND ADDITIVES

FabPatch Vaatelaastari  
UPM Biochemicals  
UPM Biocomposites  
Wimao

## RECYCLING AND REUSE OF COMPONENTS

Ecomation  
Sensmet

## SUSTAINABILITY CAR AS A WAY OF LIFE

Addcomposites

## CONNECTIVITY

Tramigo

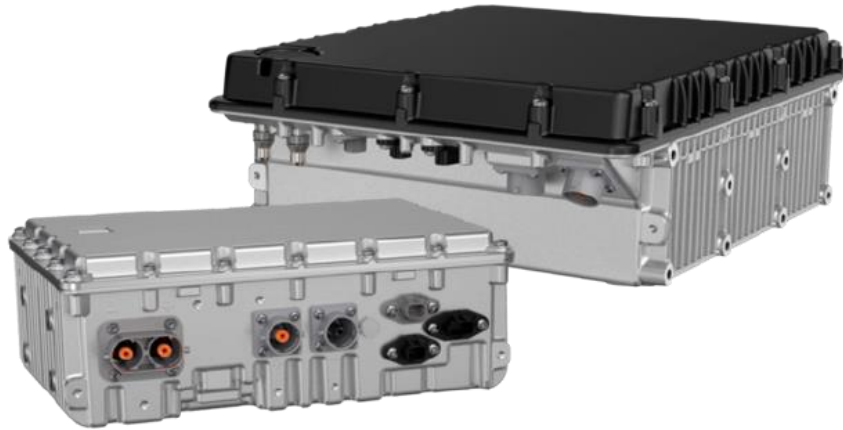
# ENGINE ELECTRIFICATION

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BUSINESS  
FINLAND

Valmet Automotive





# MODULAR BATTERY PLATFORM

## OUR SOLUTION

Valmet Automotive has introduced the first product of the Modular Battery Platform product family, the Modular Power Pack. With the platform, we offer a benchmark electrification solution for Truck&Bus and Off-highway OEMs as well as integrators. The Modular Power Pack is available in two versions— one including the Battery Management System (BMS) to serve all 48V applications, and the other working with an external Power Distribution Unit (PDU), also including the Battery Management Unit (BMU), to support all high-voltage applications.

## BENEFITS FOR THE CUSTOMER

- Highest quality and safety standards guarantee top performance and optimized total ownership cost.
- Easy to fit into a vehicle or machine in any orientation to make best use of available space.
- Technical support available throughout the lifetime of a machine or vehicle.

## COMPETITIVE ADVANTAGE

The Modular Battery Platform provides a unique combination of performance, lifetime and competitive pricing.

Based on the highest flexibility and easy integration, this is a solution for most application needs on the market.

## COMPANY

The Valmet Automotive Group is a leading European manufacturer of electric vehicle battery systems and automotive kinematic systems for OEMs. It is also one of the largest vehicle contract manufacturers in the world.

## REFERENCES

Battery system for the Ponsse EV1 electric forest machine technology concept.

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# SUSTAINABLE MATERIALS AND ADDITIVES

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BUSINESS  
FINLAND

FabPatch Vaatelaastari

UPM Biochemicals

UPM Biocomposites

Wimao



## UPHOLSTERY REPAIR REINVENTED

### OUR SOLUTION

FabPatch is a sustainable rub-on textile repair solution innovated by Finnish moms. In the first 3 years, more than 800,000 FabPatches have extended the lifetime of various textiles, from clothes and gear to motorbike seats and furniture. The patches are flexible, adjusting easily to movement and different surfaces. Our main collection is made with recycled PET-bottles, but other textile materials are also possible. Designed to respond to a need and please the eye, FabPatches make sustainable acts easy, stylish and affordable in everyday life.

### BENEFITS FOR THE CUSTOMER

- Repairing textiles such as torn or stained car upholsteries with FabPatch is easy and fast!
- By providing a FabPatch Repair Kit, the car industry promotes sustainable actions in everyday life.
- Well maintained interiors keep up the pleasure of use and retail value of the vehicle.

### COMPETITIVE ADVANTAGE

FabPatches are the only flexible rub-on-patches available that are also highly customizable. The

size, shape, and print, and even the material can be altered according to the intended use.

### COMPANY

FabPatch Vaatelaastari is a partner for sustainability acts and communication. Founded in 2019 by three Finnish moms. Nominated in 2021 as one of the Pioneering Circular Economy Companies in Finland by the Finnish Innovation Fund Sitra. Recent Awards: the Sustainability Act of the Year 2022 by the Finland Chamber of Commerce, the Design Deed of the Year 2022 by the Association for Finnish Work and the Circular Economy Award of Textile and Fashion 2022 by the Finnish Fair Foundation.

### REFERENCES

FabPatch Vaatelaastari has made customized repair products with more than 15 respected partners such as Image Wear, Kaiko, Ruskovilla and Ateneum.

### CONTACT

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# TRANSFORMING RUBBER FROM WITHIN

## OUR SOLUTION

UPM BioMotion™ Renewable Functional Fillers (RFF) are made from responsibly sourced wood. RFF is a sustainable alternative to fossil-based and highly CO<sub>2</sub>-intensive carbon black and silica in a variety of elastomers, thermoplastic elastomer and plastics applications. RFF offers the maximum renewable content while drastically reducing the carbon footprint. It is perfect for automotive weatherstrip, hoses, seals, interior and exterior plastics parts, and other industrial rubber applications. With a density of only 1.35 g/cm<sup>3</sup>, it is at least 25% lighter than traditional filler systems.

## BENEFITS FOR THE CUSTOMER

- Increase renewable carbon content.
- RFFs have a 90% lower carbon footprint than standard furnace carbon black. Short-term target is to become CO<sub>2</sub>-neutral.
- RFFs provide top product performance with much lower material weight and the highest level of purity.

## COMPETITIVE ADVANTAGE

UPM BioMotion™ Renewable Functional Fillers enable the rubber and plastics industry to take the next step to minimize the overall CO<sub>2</sub> footprint, resulting in more sustainable products. RFF drives the shift from fossil to sustainable raw materials and to a responsible circular economy.

## COMPANY

UPM has entered the biochemicals business by investing in a biorefinery at Leuna, Germany. UPM Biochemicals offers innovative, sustainable and competitive wood-based biochemicals to replace fossil-based raw materials in various applications.

## CONTACT

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<https://www.upmbiochemicals.com>



# UPM FIBCO—SUSTAINABILITY AND PERFORMANCE

## OUR SOLUTION

UPM's renewable, responsibly sourced wood-based fiber concentrate UPM FibCo offers superior environmental and technical performance with substantially lower weight and a smaller CO<sub>2</sub> footprint for plastic compounds used in various automotive applications. The UPM FibCo fiber concentrate is used in traditional compounding extruders as a filler/reinforcement to replace glass fiber or talcum, or just to decrease overall plastic use without sacrificing performance.

## BENEFITS FOR THE CUSTOMER

- 80% lower footprint compared to glass fiber (0.54 kg CO<sub>2</sub>/kg)
- High biogenic carbon content (up to 1.65 kg CO<sub>2</sub>/kg)
- Up to 40% lighter than traditional filler systems (material density of 1.35 g/cm<sup>3</sup>)

## COMPETITIVE ADVANTAGE

Millions of tonnes of non-renewable, heavy and CO<sub>2</sub>-intensive fillers are used in different industries.

Industries are actively looking for more sustainable filler alternatives to replace fossil-based plastics. UPM FibCo offers superior technical and environmental performance in plastic end-uses.

## COMPANY

UPM Biocomposites is part of UPM, the world's leading producer of renewable and recyclable products. High-performing biobased alternatives to non-renewable materials. Natural fiber composite manufacturer. Patent portfolio on material and production technology.

## REFERENCES

See our references on the [upmformi.com](https://www.upmformi.com) website: <https://www.upmformi.com/references>

## CONTACT

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# WIMAO—CARBON-NEGATIVE PLASTIC SOLUTIONS

## OUR SOLUTION

Wimao has very innovative technology for recycling mixed plastic waste and converting it into high-quality plastic or composite products, simultaneously saving a vast amount of CO<sub>2</sub> emissions. It has been calculated that one process line with a capacity of 7,000 t/a saves ca. 20,000 t/a in CO<sub>2</sub> emissions, which means that each product produced with Wimao's technology saves 2 to 3 times its weight in CO<sub>2</sub> emissions. In addition, this technology can recycle currently unrecyclable waste streams, it can be used around the world, and it has the potential to change global industries.

## BENEFITS FOR THE CUSTOMER

- Products made of recycled plastic—with Wimao technology, we contribute together to carbon reduction.
- Products are of high quality, affordable and ecological.
- All products can be recycled back to new products or components using Wimao technology.

## COMPETITIVE ADVANTAGE

Wimao recycling technology directly contributes to a reduction of CO<sub>2</sub> emissions. Our products have already been sold to the logistics and paper industries for several years. By using our carbon-negative products, everybody can influence climate change.

## COMPANY

Wimao is a technology provider focusing on recycling mixed plastic waste and other hard-to-recycle materials. The products manufactured with our technology are suitable for various industries. We are looking for a partner in the auto industry.

## REFERENCES

References on request.

## CONTACT

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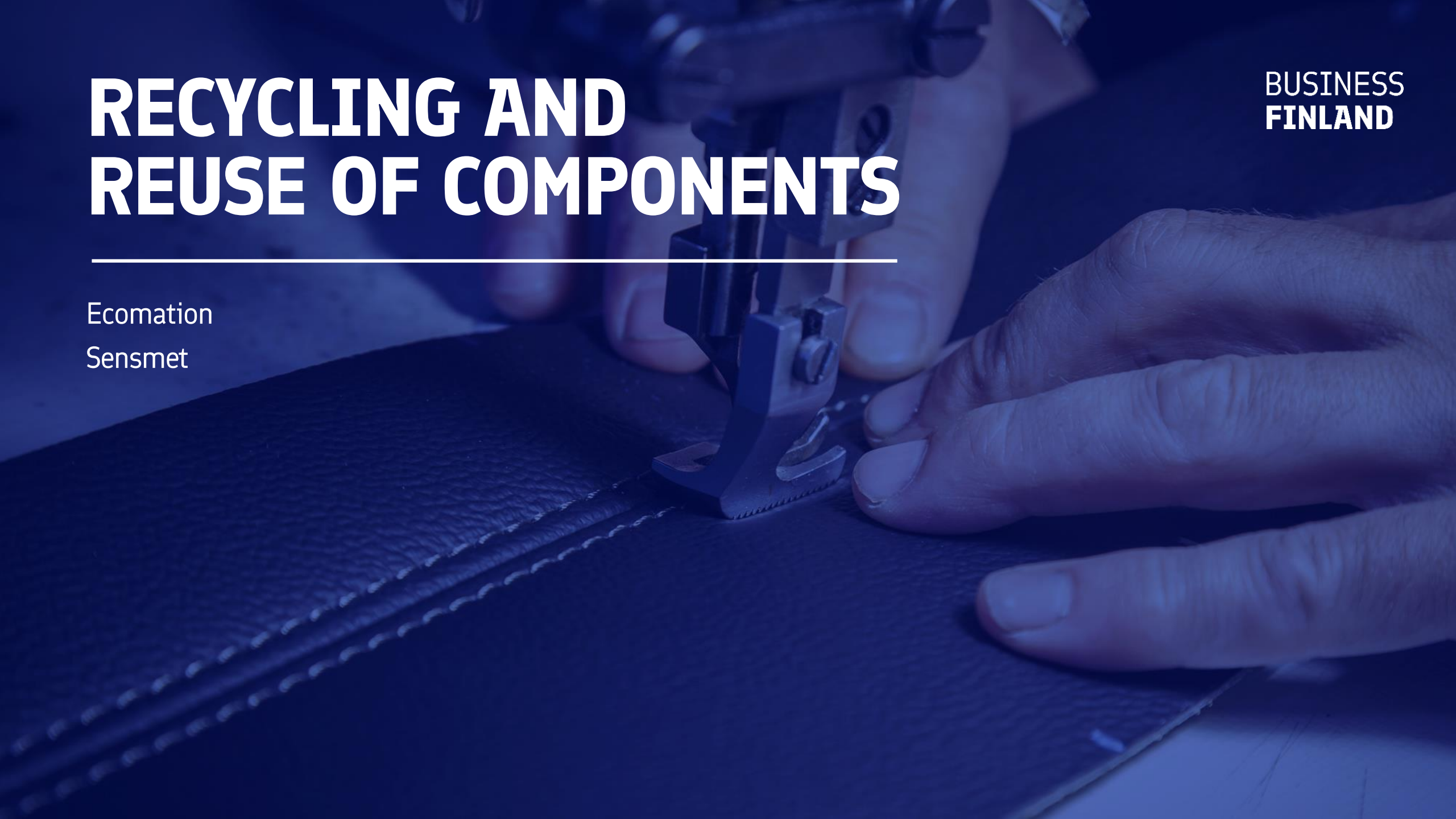


# RECYCLING AND REUSE OF COMPONENTS

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BUSINESS  
FINLAND

Ecomation  
Sensmet





## AUTOMOTIVE RESIDUE, AUTO FLUFF

### OUR SOLUTION

The use of different plastics in car manufacturing has been growing constantly. The challenge for recycling plastic components is mainly the result of the strong fluctuation in the plastic types used by the industry. Ecomation supplies process lines for the dry distillation of materials. Processed auto fluff gives an offtake of up to 70% of the input weight in chemically recyclable oil.

### BENEFITS FOR THE CUSTOMER

- High circularity/recycling of challenging Auto Fluff waste.
- Process technology with zero emissions.
- Opportunity to increase circular chain from end-of-life cars to new car component production

### COMPETITIVE ADVANTAGE

The Ecomation patented process allows 24/7 operation with minimal energy use.

The operation does not release emissions. The process is automated to minimize the operational staff required. The process is proven at an industrial scale.

### COMPANY

ECOMATION Oy is a technology supplier that generates revenue through sales of process lines for converting waste into valuable raw materials.

### REFERENCES

Gasum: operations in excess of 3 years; Savonlinna: operations for more than 2 years; LAB University: laboratory process; Kuusankoski: special solution.

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# ONLINE BATTERY METALS AND RECYCLING ANALYSIS

## OUR SOLUTION

Sensmet's Online  $\mu$ DOES<sup>®</sup> Multi-metal Analyser employs patented Micro-Discharge Optical Emission Spectroscopy to allow real-time metals analysis of aqueous process samples. In addition to lithium manufacture, the technology is suitable for the black mass recycling of Li-Ion batteries. Given the large sums of money involved in lithium manufacture, the accurate dosing of precipitation chemicals is extremely important. Furthermore, continuous monitoring of impurities such as Na, K, Ca, Cu and Zn is vital for product quality, all of which can be measured using the  $\mu$ DOES<sup>®</sup> online metals Analyser.

## BENEFITS FOR THE CUSTOMER

- $\mu$ DOES<sup>®</sup> Analyser enables accurate dosing of precipitation chemicals in Li production.
- $\mu$ DOES<sup>®</sup> allows black mass recycling via online data on main metals and impurities.
- $\mu$ DOES<sup>®</sup> Analyser is fully automated, robust and consumes no chemical reagents or carrier gases.

## COMPETITIVE ADVANTAGE

As a substitute for laboratory analysis, Sensmet brings the analytical performance of ICP-OES to production

process where real-time results are acutely needed. Sampling and laboratory analysis take several hours, meaning process managers cannot efficiently control battery metal production and recycling.

## COMPANY

Sensmet was founded in 2017 to transform the efficiency and quality of hydrometallurgical production and recycling of battery metals. Patented, award-winning  $\mu$ DOES<sup>®</sup> Multi-Metal Water Analyser is the first online solution to cover all battery metals.

## REFERENCES

A global steel manufacturer has been using  $\mu$ DOES<sup>®</sup> Multi-Metal Analyser in 24/7 process control since 2019. Collaboration with major chemical companies.

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**SENSMET**

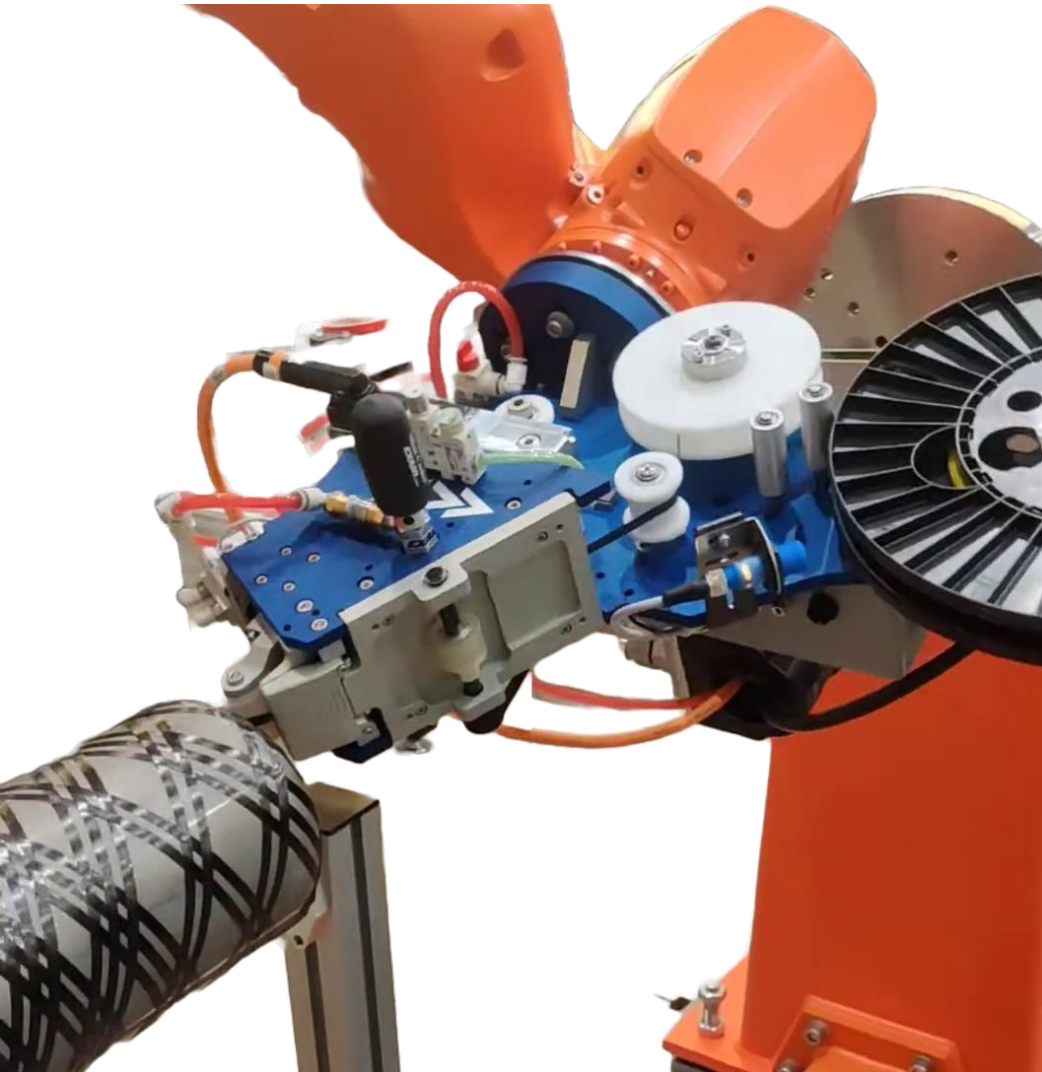
# SUSTAINABLE CAR AS A WAY OF LIFE

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Addcomposites

BUSINESS  
FINLAND





## HYDROGEN STORAGE

### OUR SOLUTION

High-capacity hydrogen tank

### BENEFITS FOR THE CUSTOMER

- Automated production.
- Lightweight additive manufacturing structure.

### COMPETITIVE ADVANTAGE

High-performance structure with high customization for user experience.

### COMPANY

We are a solution provider for lightweight additive manufacturing solutions, based in Helsinki.

### REFERENCES

We have dozens of systems across the world in the aerospace and space industry.

### CONTACT

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# CONNECTIVITY

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Tramigo

BUSINESS  
FINLAND





# EMBEDDED MISSION-CRITICAL PUSH-TO-TALK

## OUR SOLUTION

Push over cellular solution with multi-network connectivity and ultra-low latency communication for vehicle fleets optimized for OEMs focusing on heavy-duty or regular utility vehicles with a need for more fluent communication. Tramigo's Mission-Critical Push-To-Talk is the next phase available as an integrated solution.

## BENEFITS FOR THE CUSTOMER

- High-quality crystal-clear voice communication.
- Low cost.
- Quantum safe encryption.

## COMPETITIVE ADVANTAGE

A first in the market all-in-one solution with both hardware, software and multi-network cross-border seamless connectivity. The differentiating factors are in Android based software, with very low latency combined with embedded multi-network connectivity and AS256 quantum-safe encryption.

2–5 operators simultaneously. In every country.  
Easier onboarding, mission-critical coverage.

## COMPANY

Tramigo is a privately owned IoT company with industry-unique knowledge of combining embedded IoT connectivity with hardware and software with multi-network, cross-border seamless operability. The Group has operations and sales on every continent.

## REFERENCES

This solution is not yet on the market. Currently used as a hand-held device, especially by logistics and security companies in emerging markets.

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# SUSTAINABLE SOLUTIONS ON THE MARKET WITHIN 1–3 YEARS

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BUSINESS  
FINLAND

## SUSTAINABLE MATERIALS AND ADDITIVES

Finnfoam  
Infinited Fiber Company  
Riverrecycle  
Stora Enso

## RECYCLING AND REUSE OF COMPONENTS

Isku Interior



# SUSTAINABLE MATERIALS AND ADDITIVES

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BUSINESS  
FINLAND

Finnfoam

Infinited Fiber Company

Riverrecycle

Stora Enso

Sustainable solutions on the market within 1–3 years

## 1. Sustainable materials and additives



# BIOBASED INSULATION MATERIALS

## OUR SOLUTION

Effective insulation materials and energy-efficient solutions reduce the carbon footprint of trucks and buses throughout their lifecycles. They also greatly reduce owners' energy use and costs. Finnfoam is also developing bioplastics from waste base raw materials.

## COMPANY

Over its forty-year history, Finnfoam has become one of the leading manufacturers of plastic-based thermal insulation solutions in Scandinavia. It is our vision to be a safe Finnish trailblazer for ecological construction.

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Sustainable solutions on the market within 1–3 years

## 1. Sustainable materials and additives



# INFINNA™ TEXTILE FIBER —BORN FROM WASTE

## OUR SOLUTION

Infinited Fiber Company's technology gives cellulose-rich waste streams like discarded textiles a new life as Infinna™—a premium fiber that looks and feels soft and natural like cotton and is just as versatile. The regenerated Infinna™ fiber has been validated by the world's leading apparel and textile brands and is seen as a circular alternative to virgin cotton in a wide range of textile products, including non-woven applications. Infinna™ is biodegradable, contains no plastics, and textiles made with it can be recycled in the same process.

Infinited Fiber Company's technology is flexible and ready to be licensed. While they focus on creating value from discarded cotton textiles, their technology can also use other cellulose-rich materials—cardboard, paper, wheat straw—to create the same fiber.

Infinited Fiber Company has announced a commercial-scale factory (30,000 tonnes per annum) plan to produce Infinna™ in Kemi, Finland, for the world's leading apparel companies.

## COMPETITIVE ADVANTAGE

Infinited Fiber has secured investments and multi-year Infinna™ sales deals with leading brands, an indication of the fiber's relevance and potential. The technology can use various cellulose-rich waste streams (textiles, cardboard, rice straw) as raw material, making it flexible for licensees.

## COMPANY

Infinited Fiber Company is a fashion and textile technology powerhouse on a mission to make circularity an everyday reality. Its breakthrough innovation transforms trashed textiles into Infinna™, a brand-new premium textile fiber.

## CONTACT

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Sustainable solutions on the market within 1–3 years

## 1. Sustainable materials and additives



# OCEAN-BOUND PLASTIC MATERIALS

## OUR SOLUTION

RiverRecycle creates a closed-loop solution in which plastic is truly circular. The solution we offer includes four interlinked intervention methods—a waste processing solution, river plastic collection, land-based segregation and collection, and community engagement—to create new markets for traditionally hard-to-recycle plastic waste and avoid future leakages.

We turn leaked plastic waste or waste with a high risk of being disposed in the environment into recycled materials through mechanical and chemical recycling technologies. These end-products can be offered to the car manufacturing industry to increase the product's recycled content.

Moreover, RiverRecycle also makes a positive impact on communities through “river cleaning as a free service” model. This can be a great initiative for companies to offset their plastic footprint by joining forces with us.

## COMPETITIVE ADVANTAGE

RiverRecycle offers the value chain participants a disruptive way of operating, brings tangible value to each player and can satisfy customer demand in a growing market. RiverRecycle creates a closed-loop model in which the waste management solution itself is commercially sustainable.

## COMPANY

Established in 2019 in Helsinki, Finland, Riverrecycle Oy's vision is to solve the plastic pollution issue at its roots. We aim to close the plastic value chain and create a truly circular concept in which waste is considered a resource.

## CONTACT

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Sustainable solutions on the market within 1–3 years

## 1. Sustainable materials and additives



# BATTERIES FROM TREES: LIGNODE® BY STORA ENSO

## OUR SOLUTION

Electrification is great, but batteries still rely on fossil-based materials such as graphite. But what if you could replace non-renewable graphitic carbon with something more sustainable? Something made from trees? Lignode® by Stora Enso is a biobased hard carbon made from lignin—an existing byproduct in the production of cellulose fiber.

Lignin is renewable and traceable and is already being produced in millions of tonnes in Europe. Lignode is a sustainable enabler for electrification, and we believe in working together to change the fast-growing anode materials market.

Our mission is to make electrification and the car industry more sustainable and accelerate scale-up and commercialization to drive self-sufficiency in the European battery supply chain.

## COMPETITIVE ADVANTAGE

Renewable—Lignode is made of trees. Sustainably sourced from certified European forests: Lignode is a biobased solution that enables a European supply chain.

Faster charging and discharging. Better performance at low temperatures. Model already scalable for commercial production.

## COMPANY

Stora Enso is a leading provider of renewable products and one of the largest private forest owners in the world. We believe everything made from fossil-based materials today can be made from a tree tomorrow.

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# RECYCLING AND REUSE OF COMPONENTS

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Isku Interior

BUSINESS  
FINLAND



Sustainable solutions on the market within 1–3 years

## 1. Sustainable materials and additives



# SUSTAINABLE FURNITURE USING EXCESS MATERIALS

## OUR SOLUTION

ISKU is investing in and taking action for sustainability at a holistic level in its operations. By optimizing material use and reusing suitable excess materials, the environmental footprint of furniture manufacturing is shrinking one innovation at a time.

ISKU is always open for cross-industry cooperation and to evaluating the possibilities with the automotive industry to find material flows in which synergies can be harnessed.

As of today, ISKU has several products in which the primary material is reused or recycled. These materials are either from manufacturing excess or waste outside the industry, such as PET plastic from disposed water bottles. Some of ISKU's manufacturing excess is also channeled for partner companies to be used in different products. One example is the cooperation between ISKU and Lovia, in which excess leather from upholstery is used for designer purse manufacturing.

## COMPANY

ISKU is one of the largest furniture manufacturers in Northern Europe. It was established in 1928. ISKU's manufacturing is located in Lahti, Finland and it is powered by solar energy for seven months a year.

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