

# Drive e-mobility with Mubea





## WE SUPPORT YOUR TRANSFORMATION

# Mission Statement

For over 100 years, Mubea has significantly contributed to the success of sustainable mobility with our core capabilities: to develop and produce the best-in-class lightweight solutions for the automotive industry.

In addition, we are leading the way to successfully establish our innovations in the fields of micro-mobility and aviation - with a goal to be climate positive by 2035.

Mubea is committed to creating exceptional value for all of our stakeholders which include our investors, customers and employees. We stand for trustful and fair collaboration with our employees and offer long-term career opportunities.

Our future success is based upon the solid and proven values of a family-owned company. We act in a long-term sustainable manner building upon our **“Driven By The Best”** corporate culture!

## light.efficient.global.

Who are we

- › Global market leader in the development and manufacture of automobile products
- › Owner-operated family company since 1916
- › Lightweight component design specialist
- › Vertical integration from raw material to finished product
- › Internal development of production processes

## Ambitious. Reliable. Financially solid.

Key figures 2022

- › 14,000 employees worldwide
- › 50 production, development and sales locations worldwide
- › Investment ratio at 10% of sales
- › Turnover of 2.7 billion Euros
- › Annual growth more than 10%

## Investments. Plants. Projects.

2022 & 2023

### Recent Productions:

- › Stabilizer Bars – Manisa, Turkey
- › TRP-H – Shenyang, China
- › Tubular Shafts – Ujazd, Poland
- › Chassis Components – Kežmarok, Slovakia
- › Coil Springs – Sanand, India

### New investment projects:

- › Steel Tubes – Yangzhou, China
- › GFRP UBP – Žebrák, Czech Republic
- › Rollbonding – Kosice, Slovakia
- › Aviation – Ergene, Turkey
- › GFRP Leaf Springs – Saltillo, Mexico



**We contribute to the success of sustainable mobility with our BEST-IN-CLASS LIGHTWEIGHT SOLUTIONS.**

Dr.-Ing. Dr.-Ing. E. h. Thomas Muhr  
General Partner - CEO



# First-To-Market Innovations



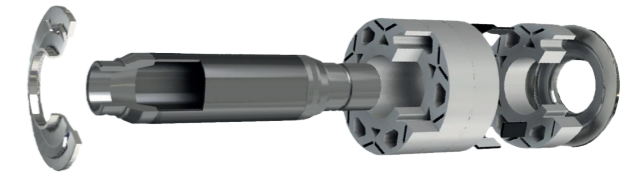
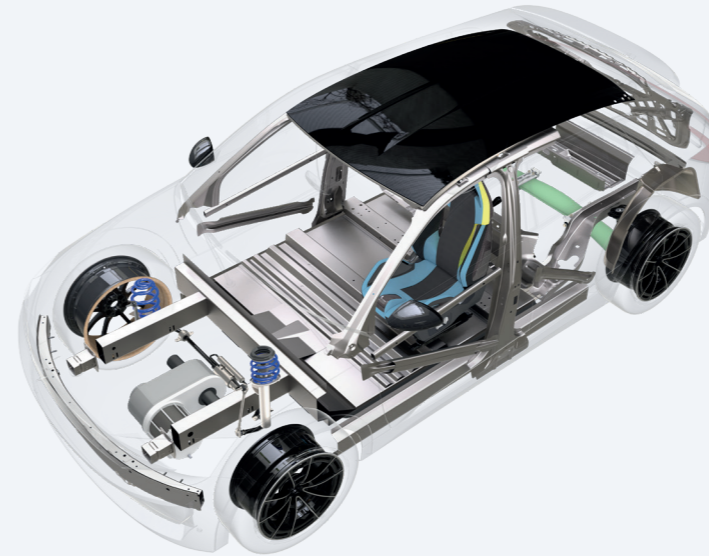
## INNOVATIVE

# Drive e-mobility with Mubea

## Innovation is in the Mubea DNA.

With our innovations and our core competence, the development and production of innovative lightweight solutions, we strive to contribute to the success of vehicles for conventional and electrified drivetrains.

Find out more about what is new at Mubea and how our latest innovations drive the change within the automotive industry.



## POWERTRAIN e-rotor

Excellent performance with simultaneous cost optimization!

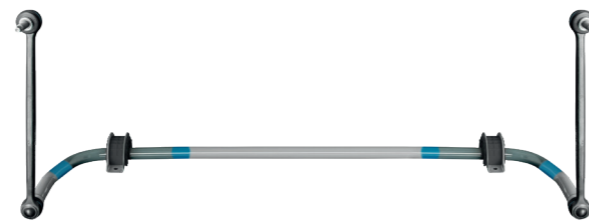
Mubea has used our core competencies to optimize components for rotors in e-motors. The flexible rotor shaft, the spring-loaded balancing discs and the spring-loaded magnet fixation lead to simplified assembly processes and result in reduced production costs. The optimized e-rotor offers the potential for higher power densities as it is suitable for speeds above 20,000 rpm.



## CHASSIS MLR - Mubea Light & Robust Coil Spring Systems for BEV

The lightest possible spring within the smallest package!

Our customers receive a holistically computer-optimized coil spring system that is designed for the new requirements of electrified vehicles. By enlarging our wire size range for lightweight technologies, we offer a weight reduction of up to 15% to the full-scope of future mobility with a tailored coil spring system approach including robust NVH-optimized interfaces and environmentally friendly in-house wire production.



## CHASSIS MACS - Mubea Advanced Customized Stabilizer Bar System

MACS is the perfect match to our customers' chassis requirements!

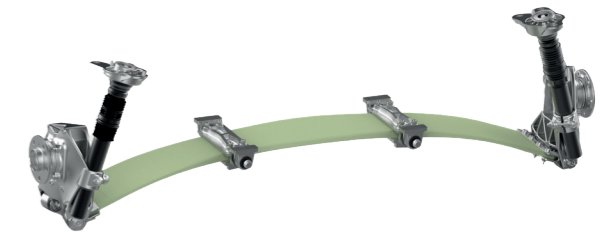
We offer engineering and manufacturing from one source. With our high level of vertical integration, we provide full performance from steel strip to the final designed and manufactured tubular stabilizer system - including various chassis components! Our target is to supply MACS without cost-penalty, in particular by using MTT, integrated link or new link concepts. Thus, we can offer a cost-neutral weight saving of up to 20%!



## CHASSIS MARD - Mechanical Adaptive Roll Damping Stabilizer Bar System

Perceivable increase of driving dynamics without influencing driving comfort!

With our mechanical adaptive Anti-Roll-Bar with damping function (MARD), is a perceivable increase of driving dynamics and steering behavior which can be achieved with equally high vertical comfort - at a third of the cost of a fully active system.

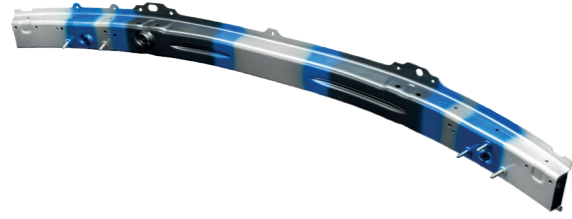


## CHASSIS GFRP Transversal Blade Spring for new BEV-axes

Reduction of weight and gain of installation space for BEV applications!

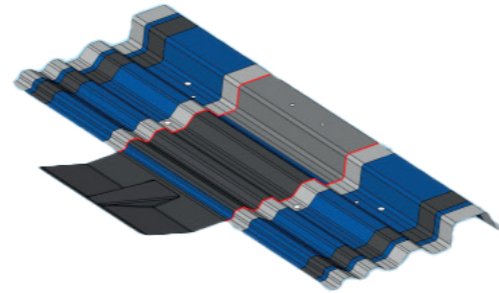
For BEV, we have developed the transversal blade spring, which replaces multi-link-axes by integrating coil springs, stabilizer bars and links into one component. This results in a weight reduction of approx. 20 kg with no on-cost while freeing up significant space for batteries!





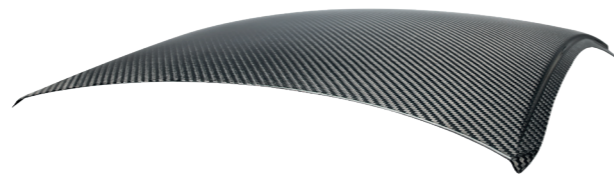
**BODY TRB applications for BEVs**  
TRB front bumper!

Our established TRB solutions make a significant contribution to improving function and weight in the body-in-white. With our extensive expertise in the design and production of safety-relevant components with variable wall thicknesses, we achieve significant weight and cost savings potential for electric vehicles. The increased crash and safety requirements for BEVs - due to the specific package and higher vehicle weight - require new lightweight solutions with higher functionality in a smaller package space. An impressive example is our TRB bumper for BEVs, which in addition to a significant weight advantage of -20 %, optimized design with improved material utilization, easily meets the high requirements in frontal crashes.



**BODY TxB Solutions**  
For highest functional requirements!

Tailor Rolled Blanks (TRB), welded prior to forming, offer the possibility of lightweight design. This is accomplished through load-oriented integration of individual parts or reinforcements, the combination of different materials and savings in tooling and joining investments. This technology, known as TxB, provides outstanding advantages - particularly for large components - with high functional requirements, such as the floor and side structures of BEVs.

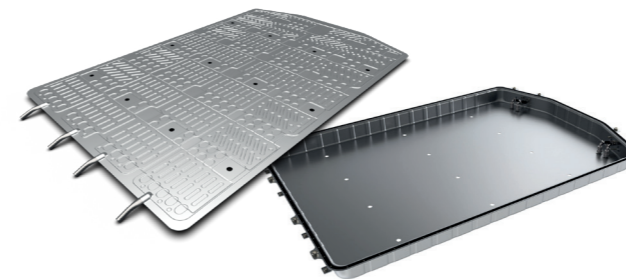


**BODY Full Carbon Roof**  
Extraordinary weight savings in the upper part of the vehicle!  
The full carbon roof offers a sporty appearance for exclusive vehicles. Due to the significant weight reduction, driving performance and, as a result, active safety can be considerably improved. On top: cost efficiency is strongly increased by advanced automated manufacturing processes.



**BODY Fiberject®**  
Carbon mirror housing made in innovative thermoplastic injection molding technology!

Fiberject® by Mubea Carbo Tech is a cost-efficient process for the high-volume manufacturing of visible carbon parts with outstanding appearance in interior and exterior applications. Fiberject® components are characterized by high cost-efficiency and full recyclability.



**BODY Battery case products**  
Roll-bonded cooling parts!  
Thanks to our system and cutting-edge technology, this continuous hot rolling process allows Mubea to offer both high-quality flat cold plates and complex shaped cooling components with significant cost savings of up to -20%. The components have a high design flexibility which can also be manufactured from high-strength aluminum grades that enable a 100% recycling rate of our products.



**BODY Lightweight Carbon Hybrid Seat**  
100 % designed and produced by Mubea!

This high-end performance seat is lightweight and features a hybrid design in a carbon look at a very competitive price. Based on a new hybrid lightweight structure, the Mubea performance seat offers a weight reduction of approx. -30% compared to current sport seats. Moreover, it offers a cost reduction compared to full carbon seat solutions. All comfort and safety components of series seats can be intergrated.



**BODY GFRP Underbody Protection**  
GFRP material with a sandwich core instead of aluminum!  
Our GFRP underbody protection with sandwich core features weight savings of more than 10 kg compared to an aluminum solution as well as extraordinary protection for the battery case. All components are manufactured in a fully automated process for high-volume applications. Apart from lightweight, this application offers several benefits to our customers such as an increase of the vehicle range and payload, better thermal insulation compared to metal, non-conductive and non-corrosive material as well as improvement of acoustic behavior.

Our strength is based upon continuous technical innovation, vertical integration, global presence and the trust of our customers.  
– Dr.-Ing. Jörg Neubrand, CTO - Managing Director



RETHINKING MOBILITY

# Mubea U-Mobility

Mubea is recognized globally as an innovative lightweight design specialist for the automotive industry. And now, we are taking things to the next level by expanding sustainable mobility beyond the automotive industry.

As such, we are introducing emission-free and affordable vehicles in the micromobility segment – uniquely tailored to the needs of our customers.

## CARGO – BIKE AT HEART, BUILT LIKE A CAR

Premium components matched with superior German craftsmanship. Our electric cargo range sets new standards in terms of robustness, functionality, ergonomics, payload and drive safety. A bike that gets stuck into the job thanks to its commercial vehicle DNA and functional design.

The vehicle basis is a light and robust frame made of durable aerospace aluminum with stabilizer bars and double wishbone suspensions with spring shock absorbers at the front and rear axles. The 16-inch performance wheels with aluminum rims and motorbike tires are specifically designed

for cargo use to ensure secure contact with the road. This is the basis for a range of diverse applications.

Whatever the job - parcel delivery, campus logistics, advertising platform or providing services, as a stand-alone or fleet vehicle - our electric cargobikes deliver highly effective solutions for every sector.

Since the beginning of its production in late 2022, various customers have already trusted our new mobility solution for their logistics needs.

## CARGOBIKE SELECTION

**Cargo PICK-UP**  
The all-rounder



**Cargo PACK**  
The mini transporter is a real space miracle



**Cargo WORK**  
The genuine workhorse



Configure your own cargobike here & visit us:



## XBOARD – UNFOLD YOUR EMOTION

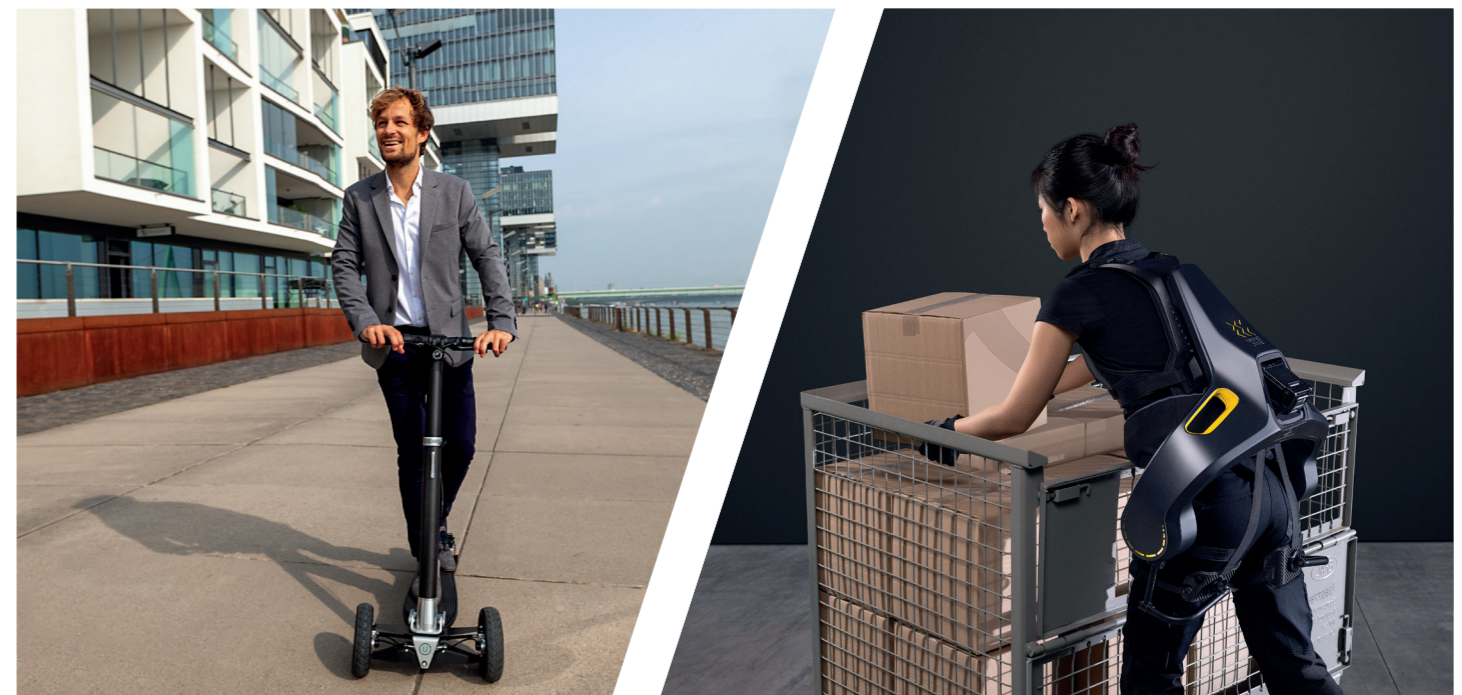
Our new e-scooter “XBoard” is a foldable, three-wheeled scooter that is fully equipped with front and rear suspension. Made of carbon fiber, it is your ideal companion from the very first mile as it can easily be carried on a train, bus and car. With its unique chassis, you are safe and comfortable on any surface!

Initial test phases and driver trials with selected customers and partners will start summer 2023. The sales launch is planned for end of 2023.

## APOGEE – WEARABLE TOOLS FOR YOUR WORK-PLACE

We are expanding our U-Mobility product range with a new partnership with **German Bionic**. This exciting alliance with the world’s leading developer of robotic exoskeletons allows us to tap into a new and extremely promising future sector.

With 66 lbs. (30 kg) support per lifting movement and active walking assistance, the robotic exoskeleton Apogee reduces the level of physical exertion required of workers while conducting their tasks. At the same time, organizations will be provided with real-time insights to enable safer workplace ecosystems.





## WIDE PORTFOLIO OF CUTTING-EDGE TECHNOLOGIES

# Aviation

Mubea Aviation manufactures components, modular elements and assemblies for the aviation industry. Our company works steel, aluminum, and titanium using metal forming, machining, surface treatment and assembly processes. In addition, composite components and assemblies are part of the portfolio processed in thermoset prepreg and RTM as well as thermoplastics.

**Machining**

Our CNC-driven machinery consists of modern, up to five-axis machining centers. This allows for an overall milling of aluminum plate material and formed sheet metal parts of aluminum, steel and titanium with the highest precision.

**Forming**

Thanks to modern machines, such as the flexform press, we are able to produce complex formed components. We cover all forming processes from deep drawing, punching, pressing, hydro forming and bending, up to roll forming. We do have heat treatment equipment, qualified by Nadcap, for solution annealing and artificial ageing of aluminum alloys, as well as for the hot calibration of titanium components.

**Heat treatment**

We do have heat treatment equipment, qualified by Nadcap, for solution annealing and artificial ageing of aluminium alloys, as well as for the hot calibration of titanium components.

**Testing and surface treatment**

Mubea Aviation's major advantage is that, testing (NDT) and at the end of the process chain, the surface treatment is carried out in-house. These include tartaric sulphuric acid anodising, and the coating of components with primer and top coats, as well as special coats, i.e. BR 127.

**Component assembly**

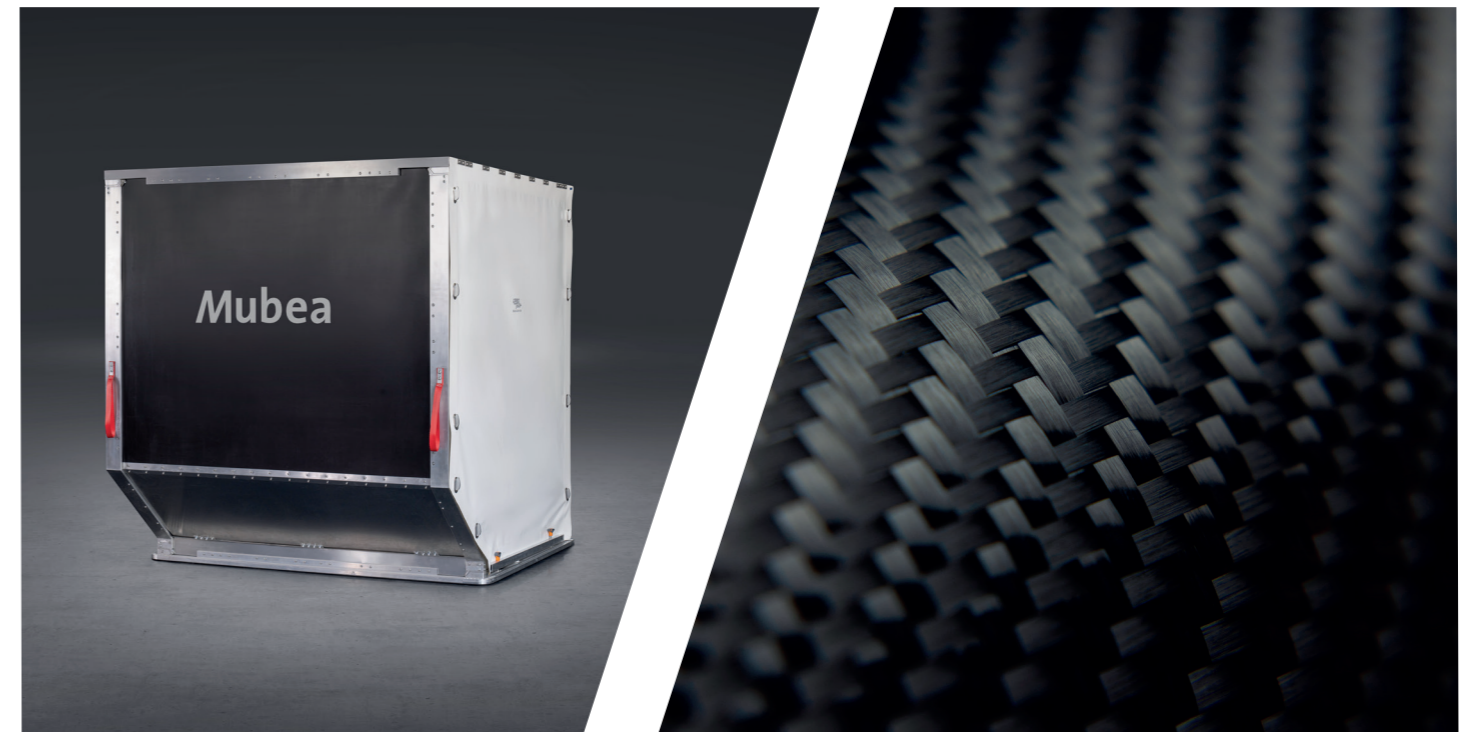
An added Mubea Aviation feature is the mounting of complex rivet assemblies. With in-house production throughout the entire process chain, our speed line capabilities enable us to meet even short-term requirements. Skilled staff and an integrated quality management system which secures top performance allows Mubea Aviation to offer very competitive products and services especially for applications with high demand of manhours.

**Engineering**

Mubea Aviation supports our customers by design and engineering of composite and hybrid structural components and assemblies. Based on the latest CAx tools, the entire digital twin process chain is offered - from design definition, material and process selection to manufacturing engineering.

**Composites**

Both thermoset and thermoplastic materials are processed to thin walled or hollow structural components. Several textile-preforming processes like Tailored Fiber Placement (TFP), sewing or braiding are used in combination with binder materials and processes. By resin infusion, Resin Transfer Molding (RTM), and wet pressing the pre-forms are processed subsequently. We also offer autoclave and non-autoclave prepreg curing as well as thermoplastic molding and injection molding.





DRIVEN BY THE BEST

# The Mubea Way

WHO ARE WE



WHAT WE OFFER

**ambitious**

We follow through and persevere by setting ambitious targets for ourselves to drive innovations from concept to successful conclusions.

**focused**

We establish key priorities and concentrate on what we do best recognizing that great achievements are usually only accomplished with a step-by-step approach.

**open-minded**

Differing views and constructive discussions guide us toward the best solutions. That is why we are always open to new ideas and developments.

**light**

Thanks to process innovations and new, high-tensile materials, we are constantly reducing the weight of many of our products. This reduces fuel consumption and helps to conserve our environment's natural resources.

**efficient**

We listen to everyone. Ideas from every single employee aim at continuous improvement and the elimination of waste contribute to the success of our company.

**global**

Our global presence means that we are able to ensure the worldwide availability of our – exactly where and when you need us.

WE ARE ACCOUNTABLE

# Sustainability

As a sustainable automotive supplier, Mubea is aware of our responsibility towards our shared environment. As lightweight specialists, we are able to influence the sustainability of our products, in particular through the development and process chains.

We at Mubea are committed to reducing our emissions by at least 25% by 2025. Although this is only the first step! As a basic principle, we follow the approach to avoid, reduce and eliminate carbon dioxide emissions wherever possible. Further, we intend to become climate positive in 2035!

We aim to reach this ambitious goal without utilizing non-transparent compensation payments, but by actively contributing to the necessary carbon dioxide removals.

We aim to reach this ambitious goal without utilizing non-transparent compensation payments, but by actively contributing to the necessary carbon dioxide removals.

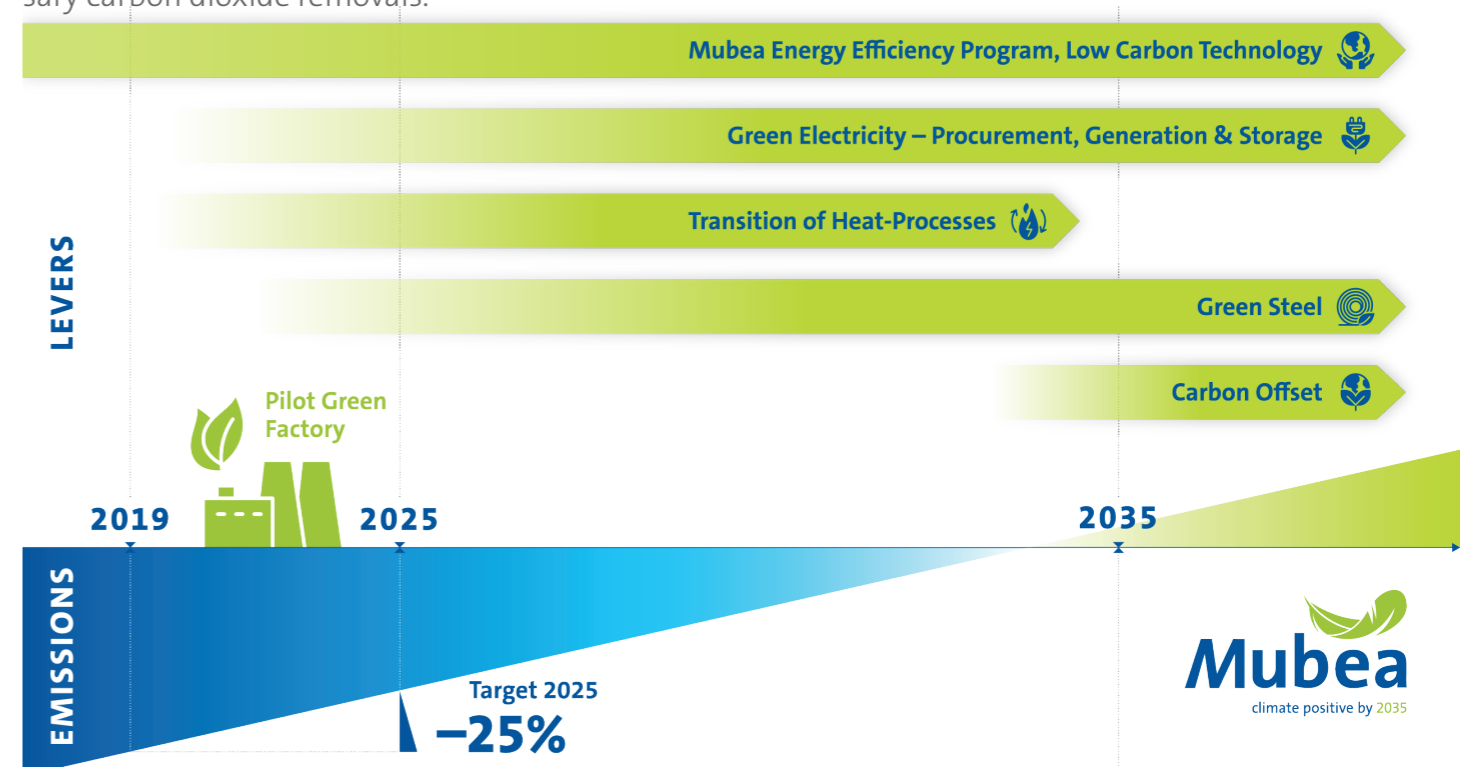
„Mubea sets an ambitious goal in the transformation towards decarbonization. Therefore, our objective is not only for a cradle to gate neutrality but to become climate positive by 2035.“

– Dr. Bernd Asmuss, Head of Sustainability

Currently we purchase green electricity with the longer term aim for self-generation of electricity in wind and solar parks.

A significant portion of Mubea's corporate emissions is caused by burning gas, thus our midterm goal is the transition to electrification. Non-electrifiable processes will be powered by green hydrogen in the future. In addition, we are evaluating the possibilities of circular supply chains and green steel purchase for a further reduction in our carbon backpack.

Sustainability is multilayered and is the foundation of our corporate strategy for a future worth living. Our aim is to be climate positive by 2035 – further pioneering the automotive industry with our innovative and lightweight products.







**Muhr und Bender KG**  
Mubea-Platz 1  
57439 Attendorn, Germany  
Phone: +49 2722 62 0  
Fax: +49 2722 62 9575  
E-Mail: [info@mubea.com](mailto:info@mubea.com)  
[www.mubea.com](http://www.mubea.com)

A decorative graphic consisting of numerous thin, light blue lines that originate from the bottom left and fan out towards the top right, creating a sense of motion and depth.

**Mubea**