

Technology Cluster Creations

- a model for sustainable success

Sächsisch – Polnischer Innovationstag

Breslau, 22. September 2017

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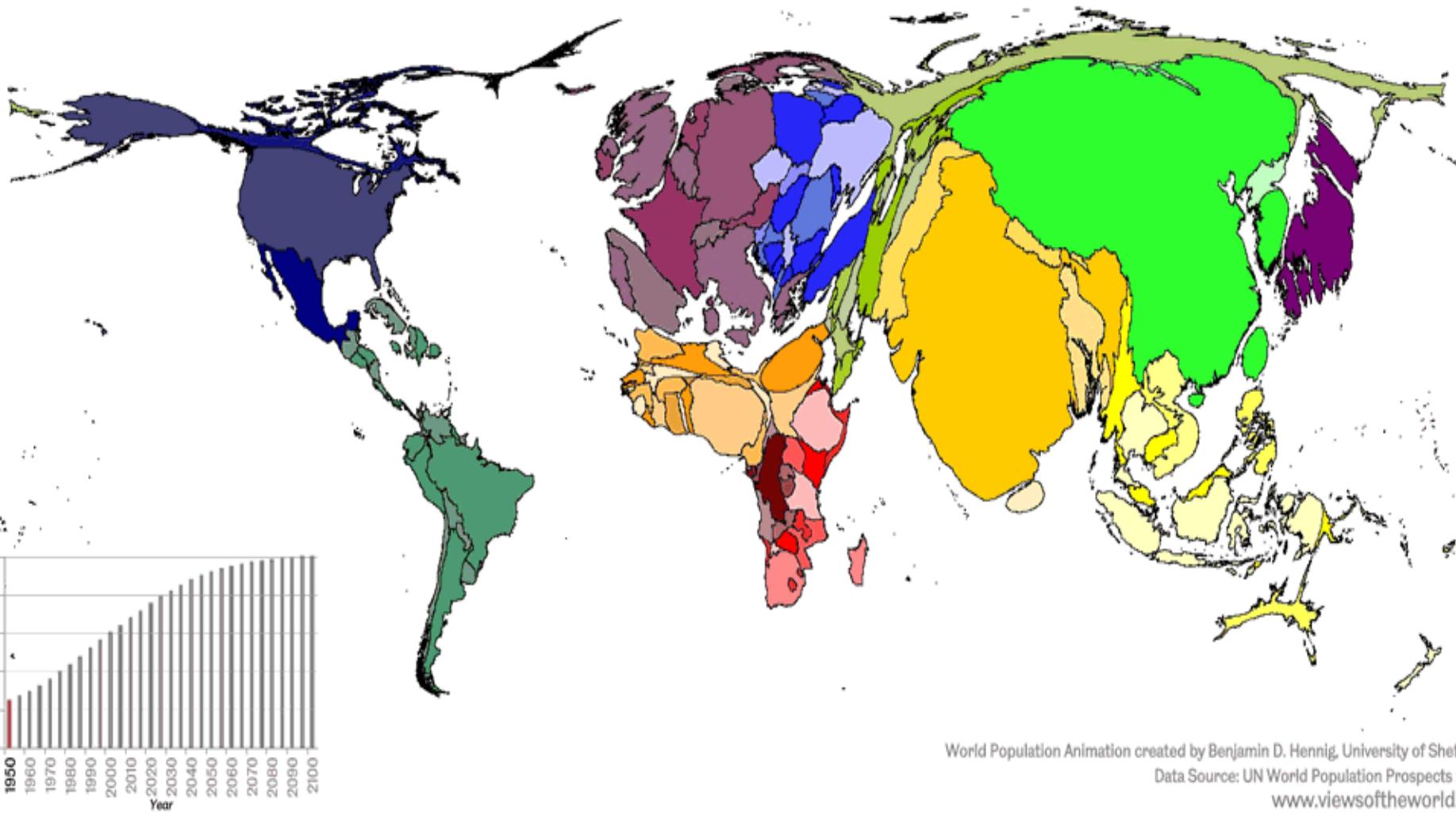
Excellence in
Lightweight
Design



CARBON
COMPOSITES

Global population growth 1950 - 2100

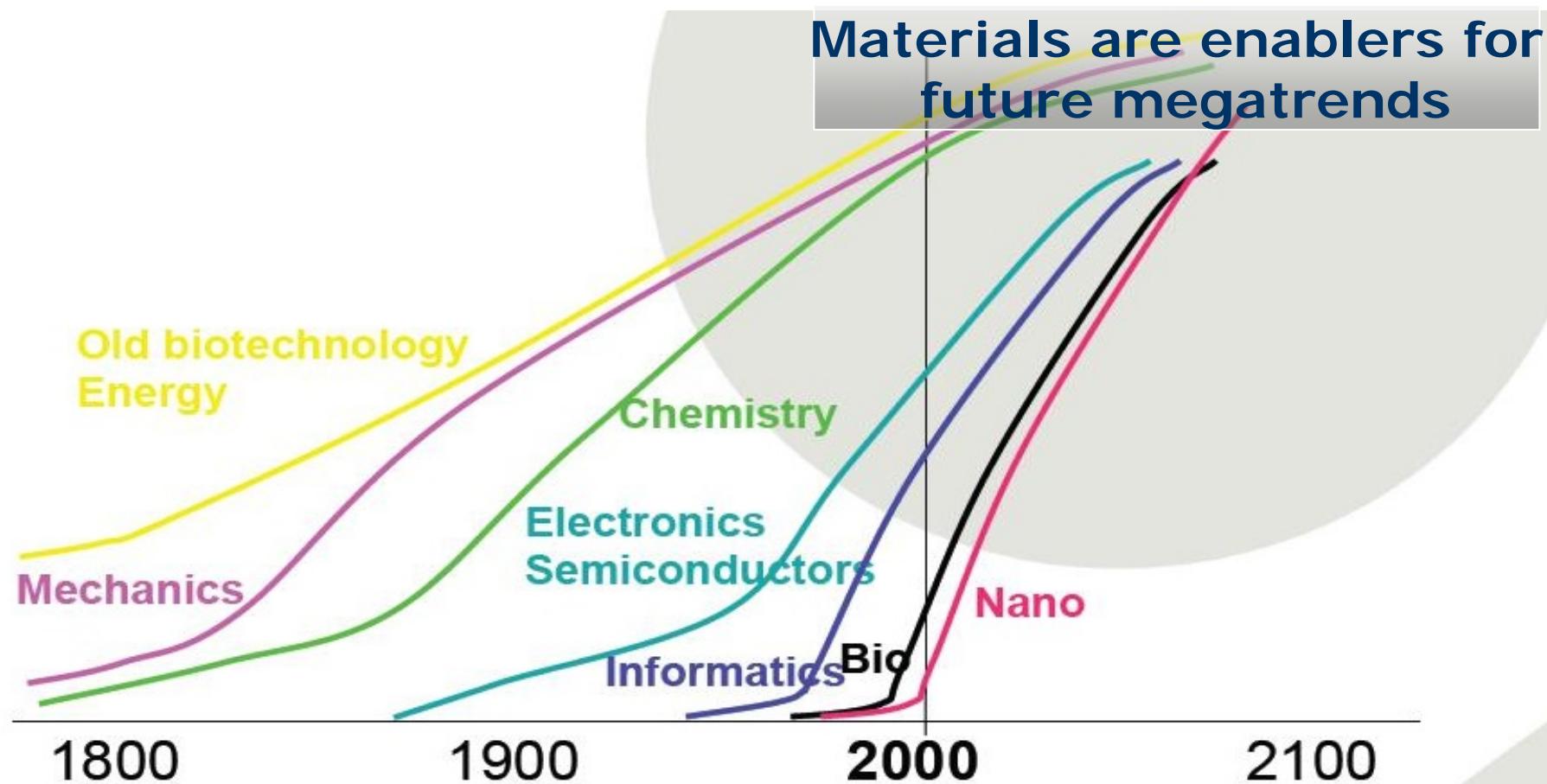
World Population 1950



World Population Animation created by Benjamin D. Hennig, University of Sheffield
Data Source: UN World Population Prospects 2010
www.viewsoftheworld.net

Megatrends are creators of our future

Yesterday ... today ... tomorrow

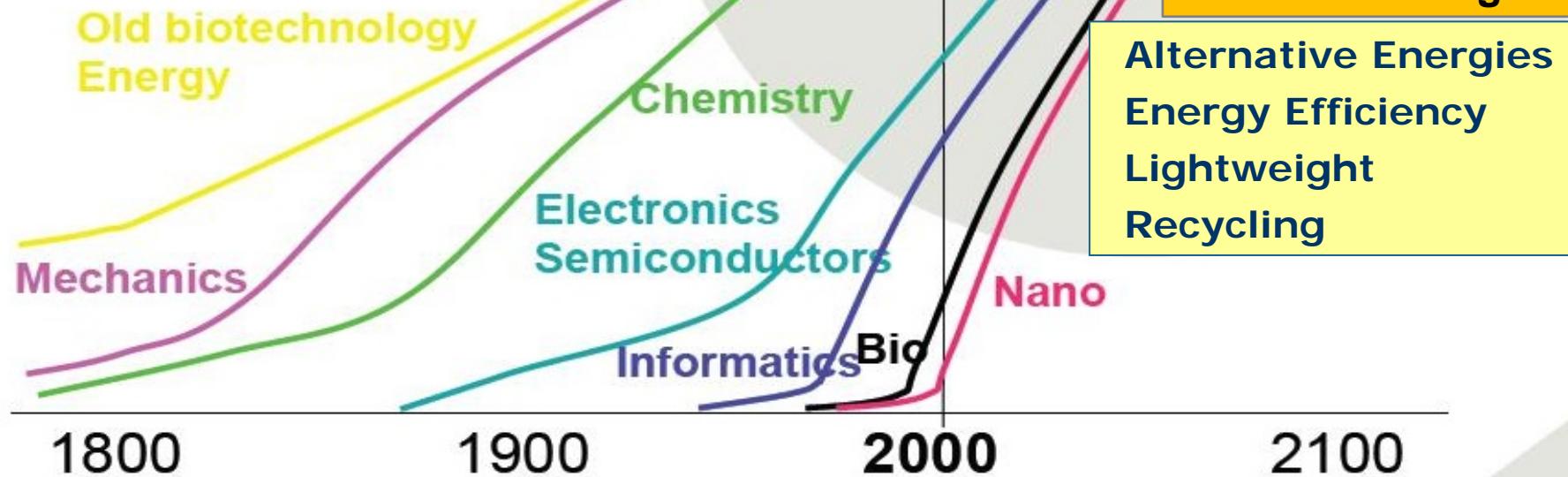


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Megatrends are creators of our future

Yesterday ... today ... tomorrow

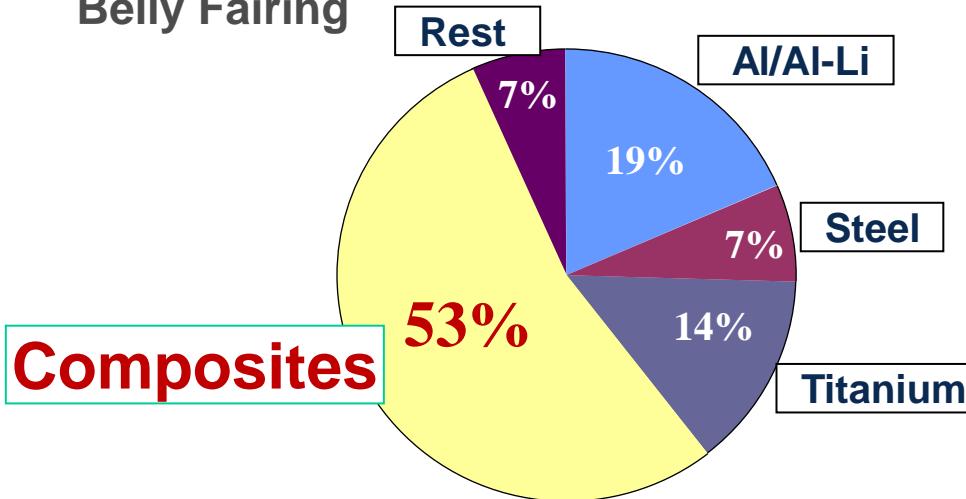
Materials are enablers for future megatrends



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Airbus A350 XWB

Hybride is Future

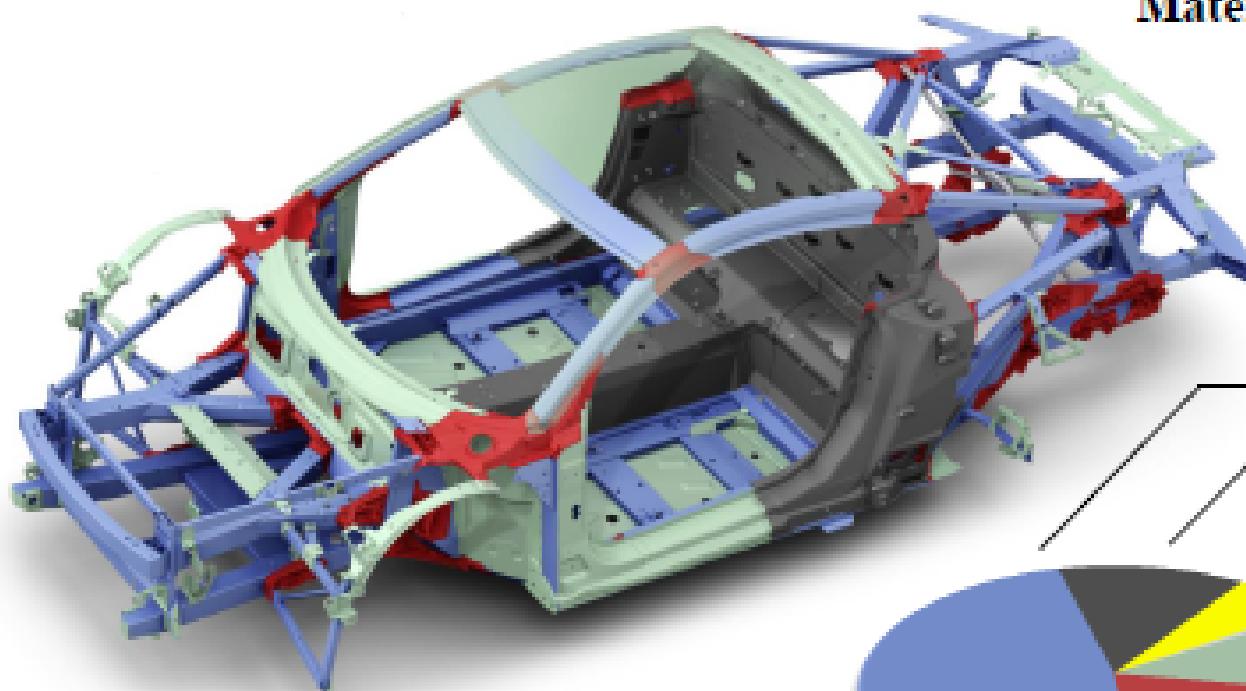


The right materials are at the right position

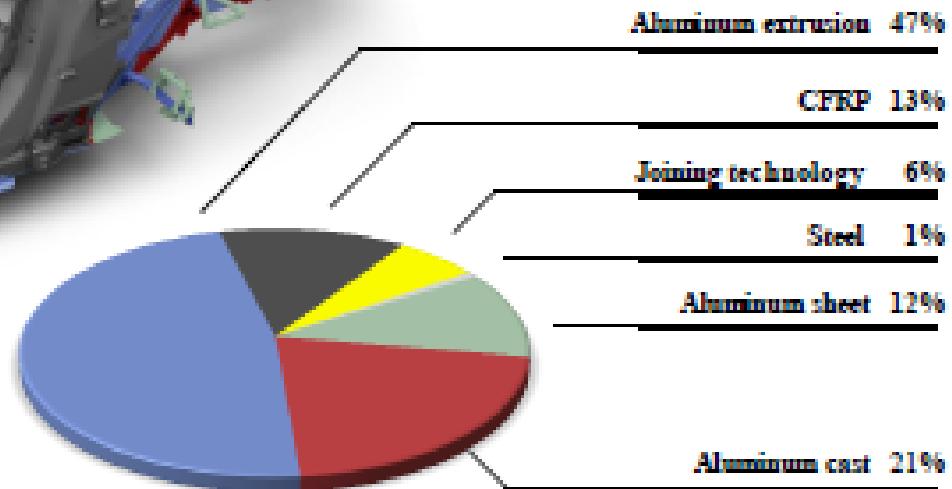
Audi R8 body structure

Hybride is Future

- Functional Improvements :
- Body stiffness + 40 %, Factor of Leightweight Quality: 1,4



Material shares in Audi R8 Body



Source: Jürgen Gerbrand, Audi

Industry Association Lithium-IonBatteries (KLiB)

Members

(Early stage of foundation ... status february 2011)



Materials

Anode

Cathode

Separator

Electrolyte

Automation

Cell Production



Chemetall

SGL GROUP
THE CARBON COMPANY

BASF
The Chemical Company

EVONIK
INDUSTRIES

MERCK

adstec

Li-Tec[®]
endless power.

Deutsche
ACCUmotive

SÜD-CHEMIE
CREATING PERFORMANCE TECHNOLOGY

SÜD-CHEMIE
CREATING PERFORMANCE TECHNOLOGY

Freudenberg

EVONIK
INDUSTRIES

EVONIK
INDUSTRIES

SÜDPACK[®]

WACKER

ECKELMANN

manz

GAIA
Advanced Lithium Battery Systems

Continental

WACKER

VARTA

Leclanché

BOSCH
Invented for life

HOPPECKE
POWER FROM INNOVATION

SB LiMotive
A joint company of Samsung and Bosch

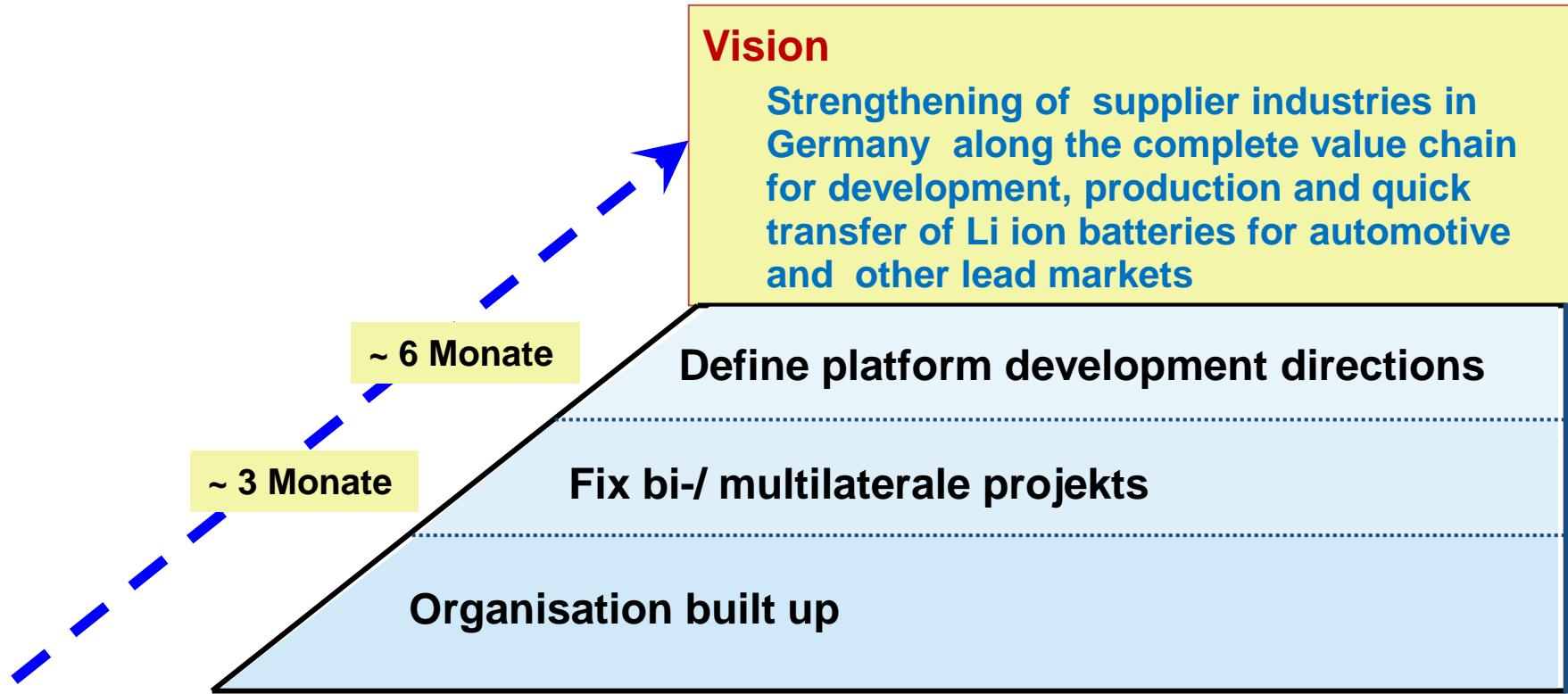
Initiative Joint Working Groups

- Strategy
- Reference Cell
- Testing & Standards
- Cell Production
- Qualifikation & Education



Industries Pilot Line

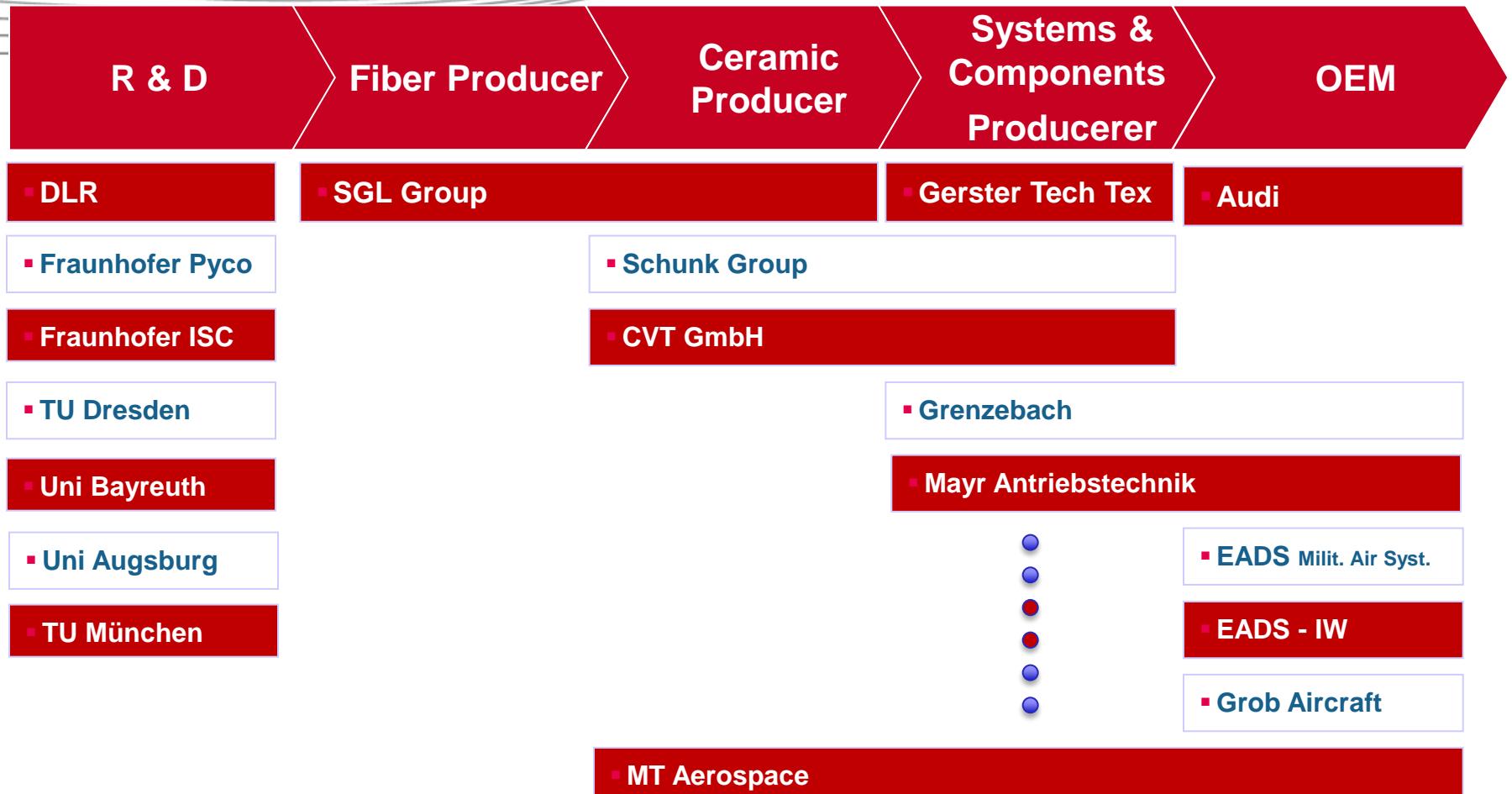
The alliance of all competencies within industry association KLb is key for joint success



- ***Whole value chain for Li ion batteries is covered***
- ***Technology leaders from User Industries define market criteria***
- ***Universities and institutes are the scientific base***

Basis 2011

The Ceramic Composites Industry Association



Members

(Early stage of foundation ... status february2008)

CFRP Process Chain ... selected CCeV members

Carbon
Fibers

Fabrics

Prepregs/
Preforms

CFRP

Ceramics



DAIMLER



CCeV Membership Status May 2016

CARBON
COMPOSITES

Company Types

- **OEMs**

- **Space and Aviation** (i.e. Airbus, Boeing, Premium Aerotec)

- **Automotive** (i.e. Audi, BMW, Porsche, Volkswagen, Daimler)

- **Engineering, Energy** (i.e. Voith, KraussMaffei)

- **Defence** (i.e. Airbus Helicopters, Airbus Defence and Space)

- **Medical** (i.e. Connova)

- **Suppliers**

- **Fibers, Textiles, Polymers, Coatings** (i.e. SGL, BASF)

- **Parts, Components** (i.e. Voith Composites)

- **Machines, Machining Systems, Equipment, Plants** (i.e. Hufschmied Zerspanungssysteme)

- **Software and Services** (i.e. ESI)



Picture credits: Airbus, ALIEN-Projectteam, KUKA

- **Fields of Materials**

- Fiber reinforced Polymers
- Fiber reinforced Ceramics
- Fiber reinforced Concrete

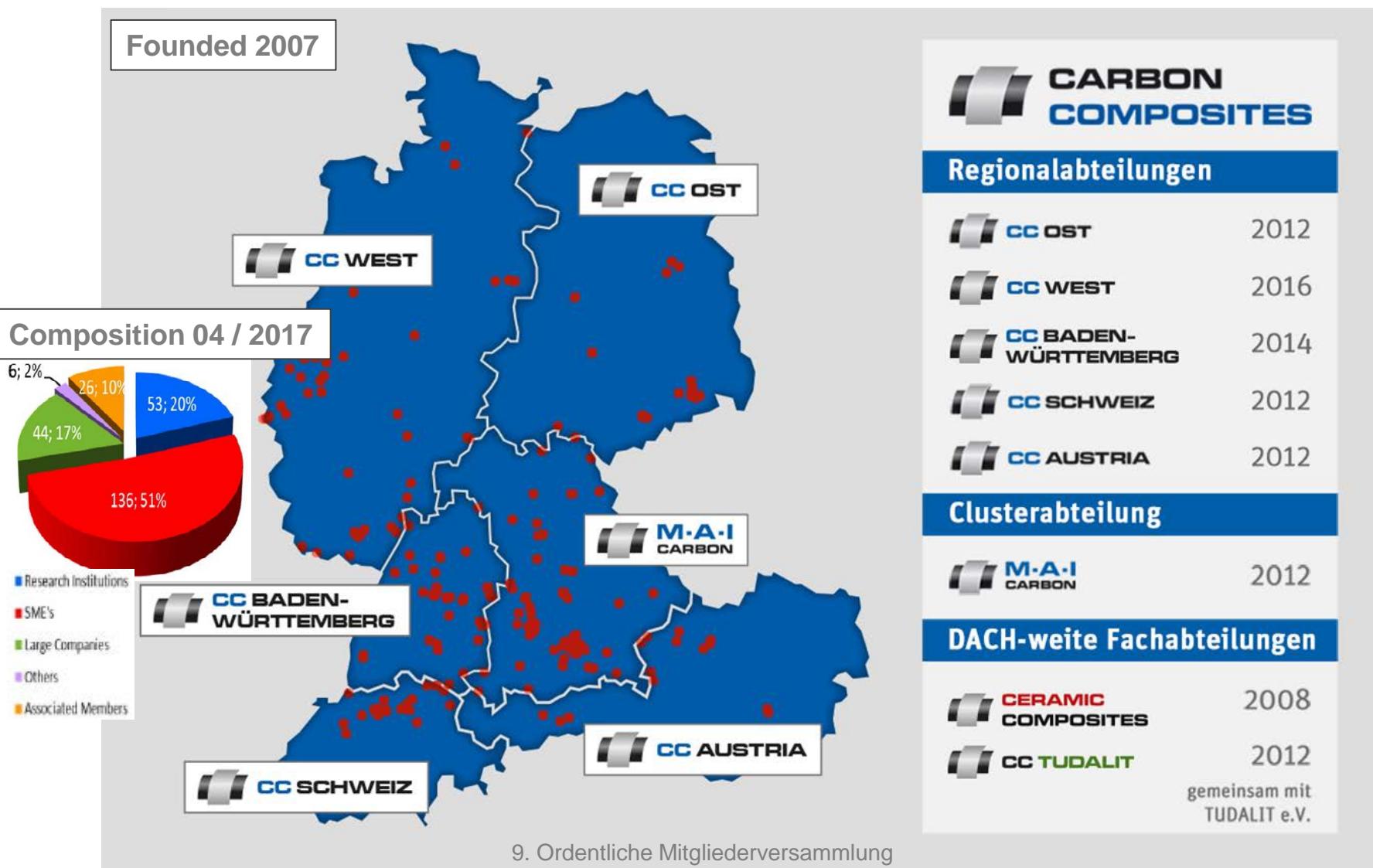
- **Network Activities**

- Technical Working Groups
- Joint Organisation of trade fairs
- Joint Conferences
- Joint Projects
- Basic trainings

- **Association Activities**

- Cooperation with national & international networks
- Market Reviews / Public Relationship Management / Lobbying
- Infrastructure & Technology Center Development

The CCeV Network ... and its Divisions



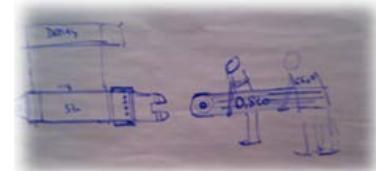
Joint Vision 2020

- The association Carbon Composites e.V. 2020 is...
 - **the most competent and innovative high end composite association with highest political European impact in DACH**
- ... with focus on the following areas:

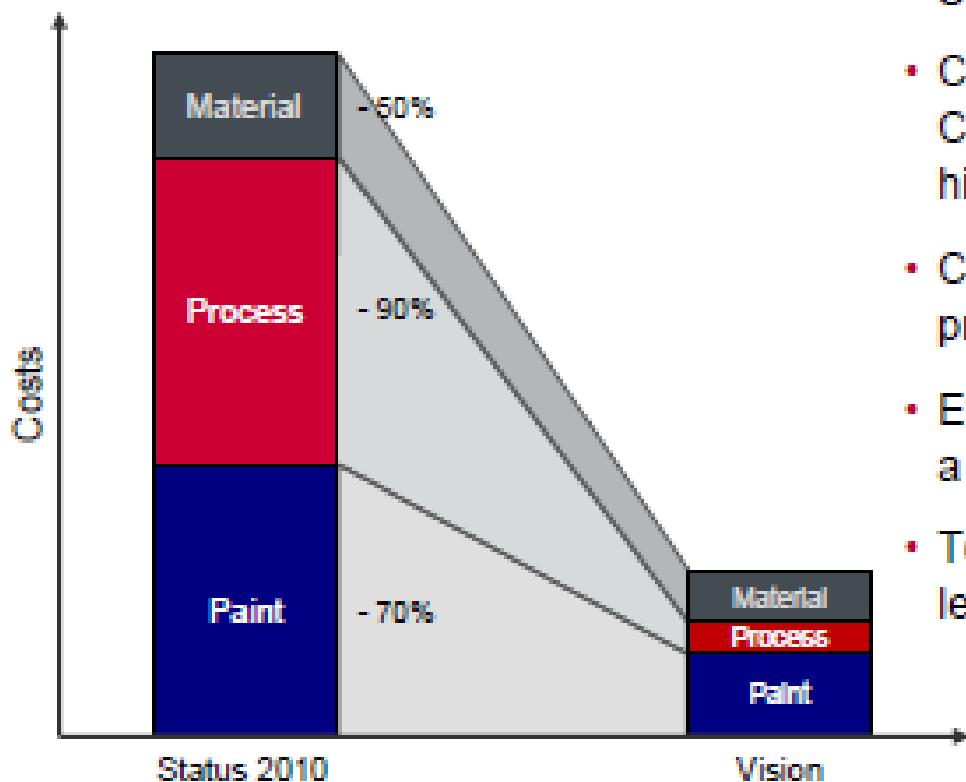
- Finances
- Organisation
- Marketing
- Sustainability
- Member value creation
- Technologies centers
- Most important KMU network
- Positive fund management
- Education
- Markets assessments
- Internationalisation



High end
composites
and materials /
systems thereof
attain
industrialisation
position

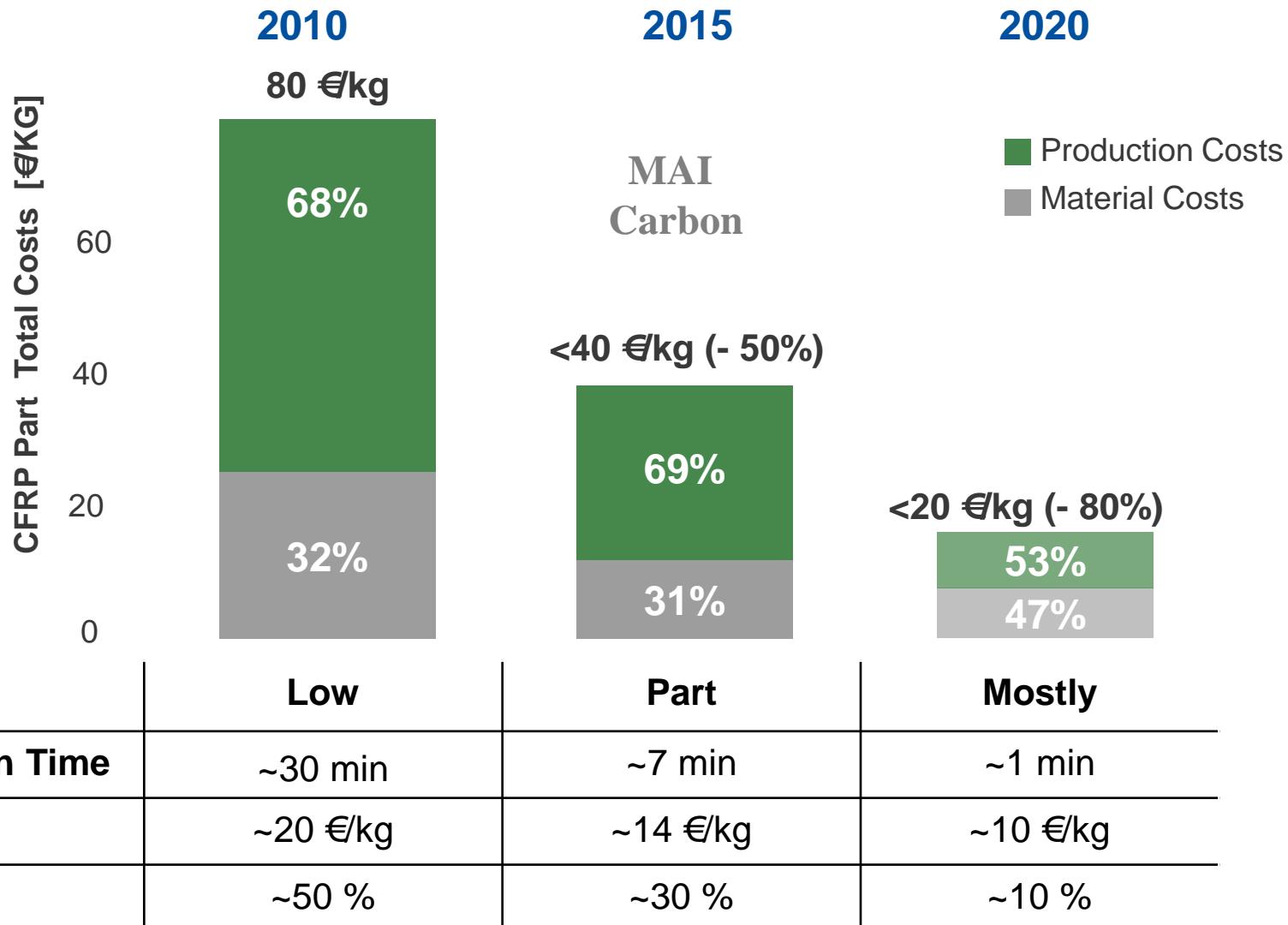


Necessary cost reduction for an industry breakthrough



- Status – Automotive :
- Currently the cost of components made of CFRP for large-scale production are too high.
- Cost reductions in fiber and composite processes are imperative.
- Evolutionary developments do not lead to a breakthrough technology.
- Technological advances associated with lengthy and costly developments.

Cost Objectives for CFRP parts



Market Transfer Potentials for Poland Industries via CarboNet Poland

- **Integration of Polish industries in the networks of the Carbon Composites Industry Net CCeV (Germany / Suisse / Austria) & Lightweight Engineering Institutes Alliance Saxony (LAS)**
- **Cross-border orientation of Saxony Lightweight Engineering towards east and vice versa**
- **Internationalization and brand building for all parties**
- **Joint research and industrial project attracting**

Establishment of **TU Dresden and AGH Krakow as unique mediator** between Polish and German research institutions and companies

CarboNet Poland



**Multi Material
Design ILK**



**Technology Center
Automotive
*Wroclaw / Gliwice***

**Technology Center
Railway
*Warsaw***

**Technology Center
Ship
*Gdansk***

**Technology Center
Aviation
*Krakow***

**Lightweight
Alliance Saxony
*Dresden / Chemnitz
Freiberg***

Lectures

**Basic Education
Demonstration & Design Concepts
Industrial Projects**

Technologies Development

Let's strive for Cooperation Excellence Saxony - Poland

Prof. Dr. rer. nat. Hubert Jäger
President



Excellence in
Lightweight
Design



CARBON
COMPOSITES