OPEN to JOIN!
Kick-off October 2022

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AZL Aachen GmbH
Excellence in Lightweight Production

Utility & Cargo Bikes

Joint Market & Technology Study

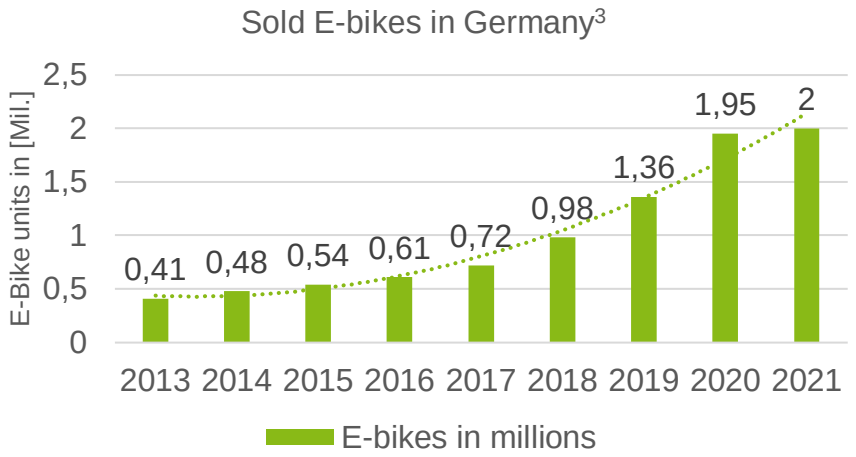
Global Development, Main Players, Trends & Future Applications,
Technical Challenges, Business Opportunities for the Composite Industry

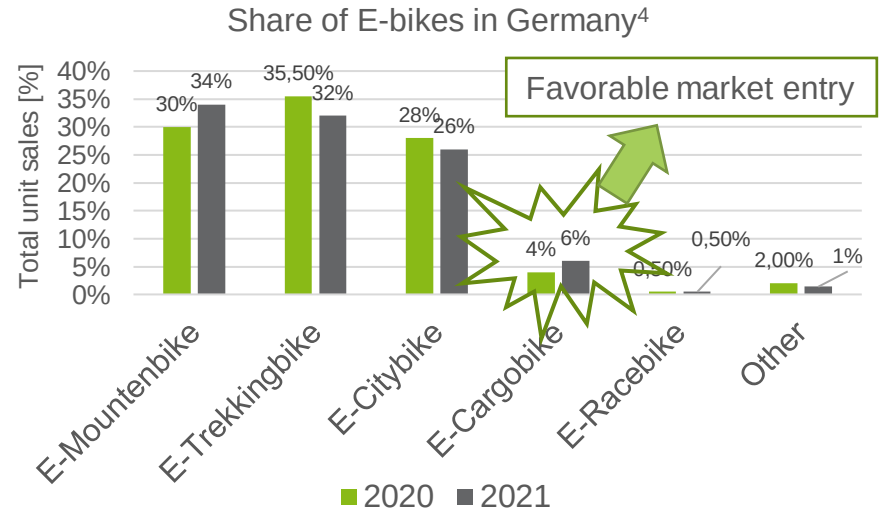
In cooperation with:

AZL Aachen Center for Integrative Lightweight Production | RWTH AACHEN UNIVERSITY

Joint Market- and Technology Study: Utility & Cargo Bikes

Identification of Business Potentials for the Composite Industry





[I:SY Cargo]

[Riese&Müller]

Bicycles & Cargo Bike Market

- The **number** of E-Bikes **doubled** in the last 3 years to over 8 million in Germany
- **E-Bike** market dominated by leading brands and manufacturers **made in Asia**
- **Cargo Bikes** are still “prototypes” build by many **regional** start-up companies
- >40 Cargo Bike companies in Germany, >15 in Netherland[1]
- Still a niche, but **growing faster** than the overall business of bicycles[2]
- High freedom of design and mostly used **metal frames** and **metal/ wood boxes**

Project Motivation

- **Identification and unlocking of hidden business potentials** for the composite industry for utility & cargo bikes
- **Entry into the fast growing utility & cargo bike market** with your **products, applications, materials & technologies**

[1] Cargo Bike companies: https://www.cargobikeforum.de/wiki/doku.php?id=lasten:start
[2] Niche and growing: https://www.manager-magazin.de/unternehmen/lastenrad-die-groessten-hersteller-a-c36bbe42-4c67-4ab9-9867-bdd7e28e97e8
[3] Statistic and overview: https://de.statista.com/statistik/daten/studie/1128290/umfrage/umfrage-zu-bevorzugten-pedelec-typen-in-deutschland/
[4] Statistic and overview: https://de.statista.com/statistik/daten/studie/152721/umfrage/absatz-von-e-bikes-in-deutschland/

Joint Market- and Technology Study: Utility & Cargo Bikes

Project Objectives

Worldwide/ European Market Development of Cargo Bikes:

[GLEAM]

[AMAZON]

[BENNO]

[BUTCHES]

Material, Trend and Technology for Industrial Applications:

[TURBOSQUID]

Types of Cargo Bikes

[Douzo]

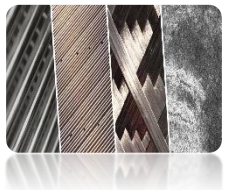
Shape-shifting Designs

[Solarimpulse]

Modularity of Transport boxes

[CARLACARGO]

Trailer Concepts



Materials & Sustainability

[Pedelec&E-Bikes]

Manufacturing

[TQ-Group]

Safety for Goods

[iStock]

Gadgets & Equipment

International Utility & Cargo Bike Market and Product Structures

- What are the current main **players, plants**, **applications**, **customers**, **suppliers, supply chains and potential sales value expectation**?
- What different concepts and solutions already exist for **frames, boxes** and **trailers**?
- What **current innovations** for utility & cargo bikes exist?
- What are the most promising **potential composite applications** for utility & cargo bikes?
- What **production technologies/ production chains** are needed for implementing composite applications for the utility & cargo bike production?

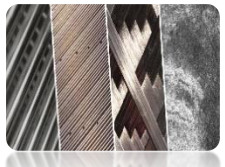
Business Case Analysis

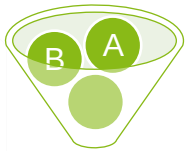
- What are the detailed **business cases regarding material combinations, production scenarios, resulting cost structures** for the most promising composite applications?

- **Current market and future market potentials**
- **Identification of hidden business potentials**
- **Selection and analysis of most promising applications for composite materials**
- **Business case analysis of the most promising application**

Joint Market- and Technology Study: Utility & Cargo Bikes

Project Procedure & Scope of Work





Selection of application

WP1

Bicycle market and current product structures, components/ applications and materials

- Which are the international major players and supply chains?
- Further market growth potentials?
- Which existing concepts, solutions, materials/ material combinations are currently used for frames, boxes and trailers?
- What are currently existing innovations for utility & cargo bikes?

Review Meeting

WP2

Potentials for new materials, material combinations and technological developments

- Which components have the best business potentials for composite applications?
- What are the technical and regulatory requirements for these components?
- Concepts for new components with composite materials/ material combinations?
- What are production scenarios for these composite components? (Manufacturing technologies, process chains)

Review Meeting/ Voting

WP3

Business case analyses

- Business case analyses of the most promising applications regarding material combinations, production scenarios and costs
- Concepts for different production scenarios depending on production volumes
- Networking with the utility & cargo bike industry to promote composite applications and definition of follow-up activities

Final Meeting/ Final Report

Joint Market- and Technology Study: Utility & Cargo Bikes

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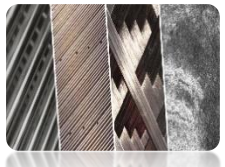

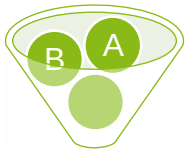

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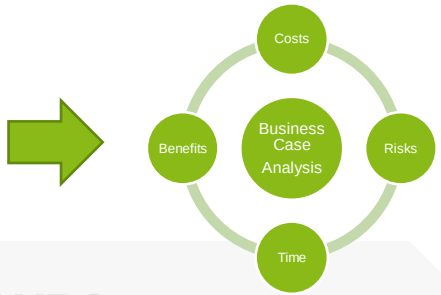

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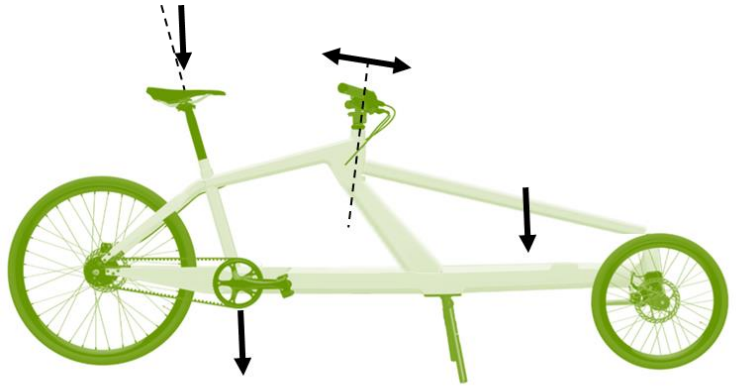
WP2: Potentials for new materials, material combinations and technological developments

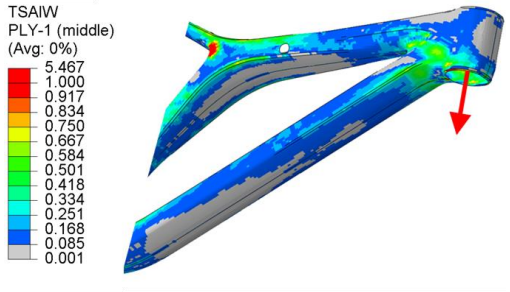
- Evaluation of the business potential for composite components
- Overview technical and regulatory requirements for the most promising components
- Derivation of concepts for new components with composite materials/ material combinations
- Analytical estimation of the required material quantities and resulting component weights with regard to the mechanical requirements
- Definition of production scenarios, suitable production technologies



1. ……..
2. ……..
3. ……..
……..

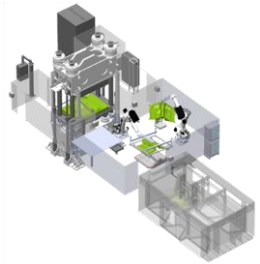
Typical requirement studies

- Material options



- Structural layouts

- Production options & Cost



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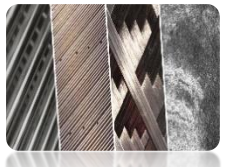

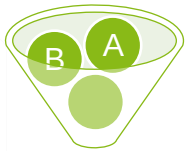

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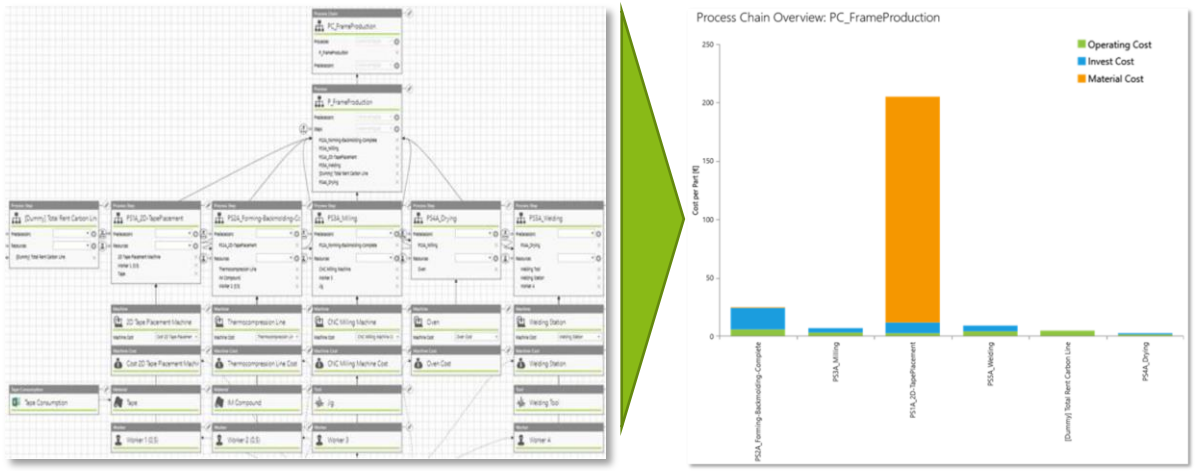
WP3 Business case analyses of the most promising applications

- Business case analyses of the most promising applications regarding material combinations, production scenarios and costs
- Definition of different potential process chains depending on production volumes for the scenarios defined in WP 2
- The process chains incl. the main process steps are modeled in a process costing software and the cost structure incl. material, investment and operational costs are calculated
- The results will be used as a basis for discussion and networking with the utility & cargo bike industry to promote composite applications and definition of follow-up activities



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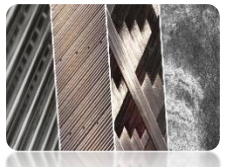

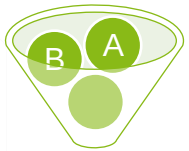

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Many thanks! Your AZL – Lightweight Center and One-stop Shop for Business and Technology Development

AZL Aachen GmbH
Excellence in Lightweight Production

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