New Joint Partner Project
Start Q3 2026

Early Bird Discount: 10 %
Onboarding before the Kick-off Meeting

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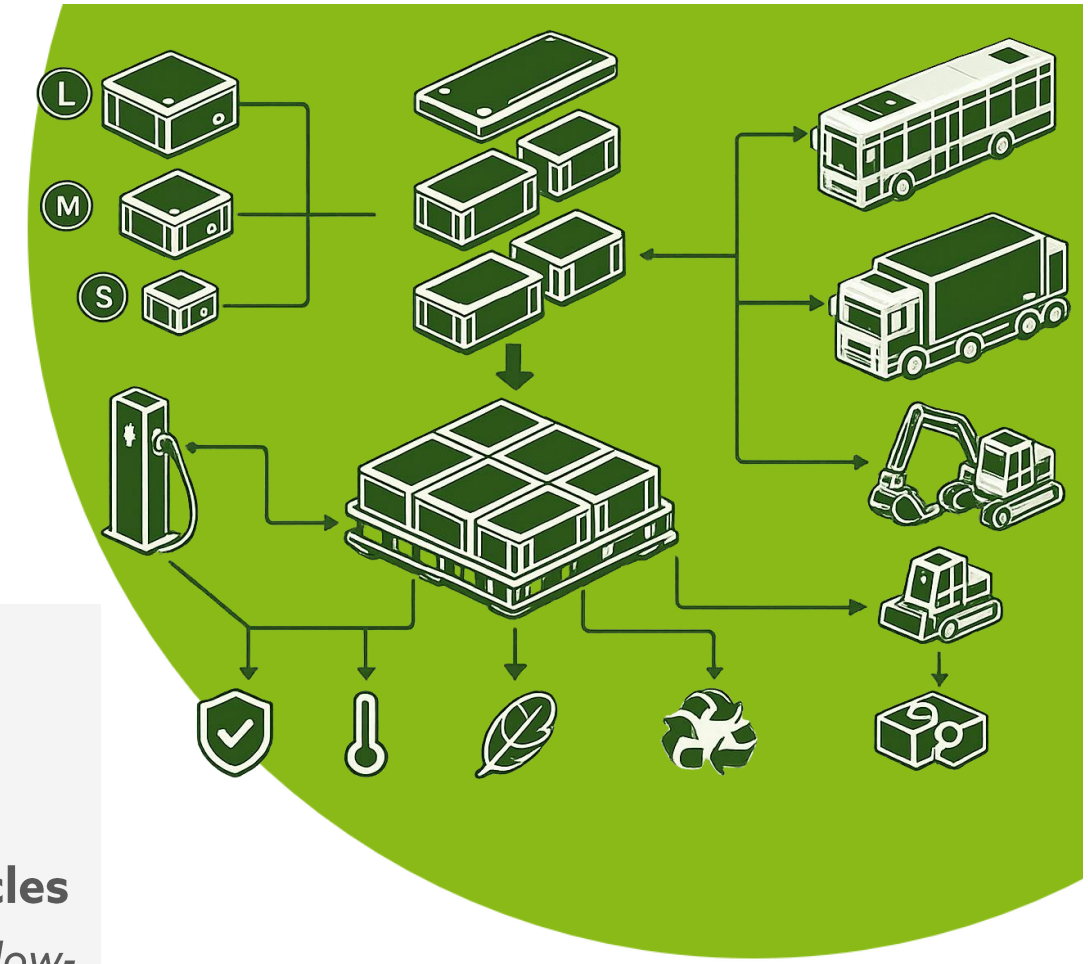

AZL Joint Partner Project:
Scaling Composite Battery Casings

A modular platform for trucks, buses & off-highway vehicles

Can modular composite casings unlock cost and weight gains for low-volume commercial vehicles — and how?

In cooperation with:

Aachen Center for Integrative Lightweight Production | RWTH AACHEN UNIVERSITY

Joint Partner Project: Scaling Composite Battery Casings

The composite opportunity and AZL's track record

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AZL Background in EV Battery Box Structures

Overview Battery Casing Joint Partner Projects

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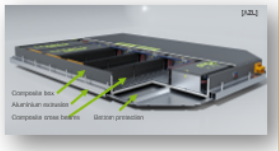
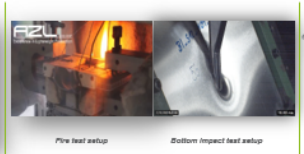
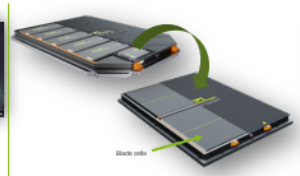
2020 - 2021	2021 - 2022	2022 - 2023	2024 - 2025
			
Multi-material battery casing (completed) ▪ 46 participating companies ▪ Trends, requirements ▪ 20 Different design concepts ▪ CAE optimisations ➔ Up to 20 [%] cost saving ➔ Up to 25 [%] weight saving over aluminium reference	**Application relevant fire test set-up (Completed)** ▪ Application relevant Instrumented test method developed ▪ 50 different materials tested **Oblique angle bottom impact protection (completed)** ▪ Application relevant Instrumented test method developed ▪ 25 different materials tested Test method is available on individual basis	**Cell to Pack (Completed)** ▪ Alternative future design concepts ▪ Direct cell installation into pack ▪ Cells mechanical characterization (theoretical) ▪ Contribution of cells to structure	**Thermal Propagation in BEV Battery Casings** ▪ Techniques for prediction of cell and casing behaviour after the initial trigger event for thermal propagation **Emerging Battery Storage Technologies** ▪ Insights into emerging battery storage technologies and their impact on design factors for battery casings

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Joint Partner Project: Emerging Battery Storage Technologies

AZL background in battery casings – partners in projects

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➔ Beyond aluminium: as e-powertrains mature, optimisation of cost, weight and performance moves centre-stage

➔ Composite casings cut cost and weight and add functional integration through moulding and multi-material design

AZL brings an extensive track record in design-for-production of composite battery casings and deep know-how on battery-storage requirements and their impact on casing design. Participants benefit from more than eight years of battery casing development, extensive benchmarking activities and collaboration with around 100 industrial partners. The foundation this project scales to truck, bus and off-highway segments.

Joint Partner Project: Scaling Composite Battery Casings

The scaling challenge – composite economics meet low-volume segments

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Passenger BEVs enable composite battery casings

- High production volumes justify tooling investment
- Economies of scale reduce part cost
- Composite battery casings already demonstrate commercial viability

Commercial & off-highway lack sufficient volume

- Trucks, buses and off-highway vehicles are produced in low volumes
- Demand is fragmented across OEMs and vehicle variants
- Individual battery casing designs remain too expensive

Modularity creates the missing scale

- Standardized battery casing architecture
- Shared components across vehicle platforms
- Pooled production volumes enable competitive composite solutions
- Reduced tooling investment and faster industrialization

Pooling volume through modular battery casing architectures enables economically viable composite solutions for commercial and off-highway vehicles.

Source: Kautex

Joint Partner Project: Scaling Composite Battery Casings

Modularity unlocks the volume — a standardised casing kit

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1

Capacity scaling

Vehicle variants carry different numbers of identical pack casings to set storage capacity.

Benefit

Increased parts/vehicle reduces mould CAPEX

2

In-mould variants

Material configurations or exchangeable mould elements adapt one casing to different use-cases

Benefit

Adapt functionality with minimal tooling changes

3

Cross-model combination

Casing variants are combined to best match each model's requirements

Benefit

Bundle demands across vehicle platforms

One shared kit, two families: Heavy-Class for trucks, buses & off-highway — Compact-Class for mini off-highway vehicles

Objectives

Project Objectives

- Determine whether and under what conditions a standardized, modular composite battery casing kit is economically viable.
- Bundle the low per-model volumes across models and manufacturers — through reuse instead of vehicle-specific design.
- Quantify cost and weight effects versus metal single-vehicle solutions on a robust basis.
- Define a shared kit architecture — Heavy-Class (trucks/buses/off-highway) and Compact-Class (mini off-highway).

Joint Partner Project: Scaling Composite Battery Casings

Results - Deliverables (10 months)

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1. **Cross-Segment Requirements Matrix** - Compare functional, integration and safety requirements across trucks, buses and off-highway vehicles to identify common design boundaries for modular battery casing platforms.
2. **Modular Battery Casing Kit** - Definition of standardized casing families, interfaces and reuse potential across vehicle platforms to maximize production volume.
3. **Validated Reference Concepts -** 3–5 CAE-validated battery casing concepts demonstrating feasible modular architectures
4. **Manufacturing Technology Benchmark** - Comparison of materials, manufacturing technologies, tooling concepts and production economics for cost-efficient battery casing production.
5. **Compliance & Safety Map** - Overview of applicable regulations, certification requirements and engineering methods for developing compliant battery casing systems.
6. **Business Case Assessment** - Break-even analysis and comparison of composite, aluminium and steel solutions including production cost, weight and CO_2.
7. **Industrialization Roadmap** - Recommended manufacturing strategy including tooling concepts, supply chain requirements and next development steps.

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Work Package 1-4: Requirements to Concepts

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WP1
Requirements & commonality assessment

Identify common technical and functional requirements across trucks, buses and off-highway vehicles and derive shared boundary conditions

Result: Cross segment requirements matrix

WP2
Kit definition & interfaces

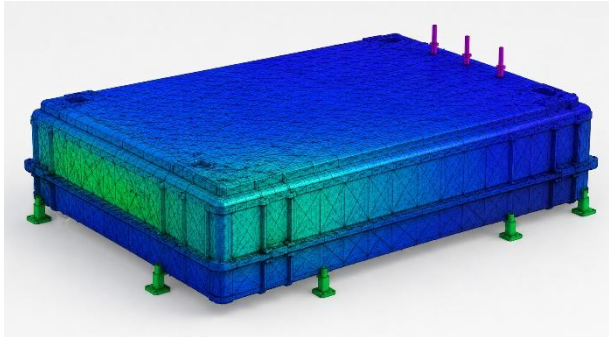
Develop modular battery casing strategies that maximize component reuse and production volume across vehicle platforms

Result: Specification for modular kit architecture

WP3
Reference concepts & CAE

Translate the modular platform into technically feasible battery casing concepts and validate their structural performance.

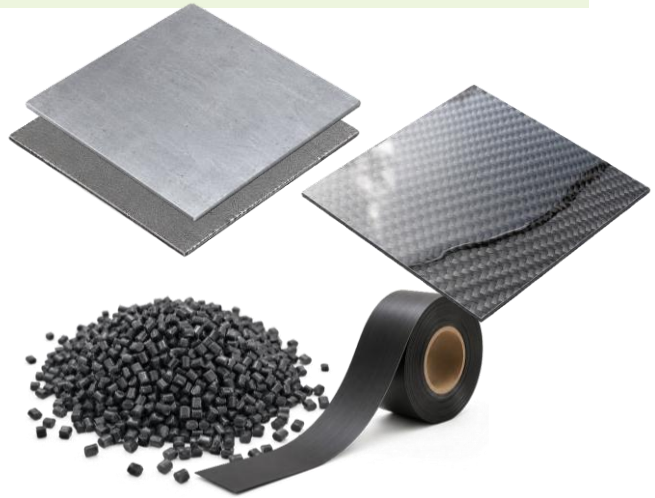
Result: CAE-validated modular reference concepts



WP4
Manufacturing benchmark

Benchmark materials (metal, plastics, composites), manufacturing technologies and production concepts to provide insights into cost, performance and CO_2 footprint.

Result: Technology benchmark



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Work Package 5-7: Technical Feasibility to Industrial Implementation

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WP5
Regulatory compliance

Evaluate the concepts regarding compliance with global safety and certification requirements.

Result: Compliance & Safety Map

WP6
Business case & scaling

Quantify production cost, weight, CO_2 impact and break-even conditions compared with steel and aluminium battery casings with high-resolution process-chain analysis.

Result: Business case evaluation

WP7
Industrialization roadmap

Consolidate the technical, regulatory and economic project results into a practical strategy for industrial implementation.

Result: Industrialization roadmap covering manufacturing, tooling and supply chain implementation

Joint Partner Project: Scaling Composite Battery Casings

Work plan – 10 months, Kick-off Q3 2026

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Kick-off Q3 2026

€ Participation fee: 19.500 €

€ Participation fee AZL Partner: 15.920 €

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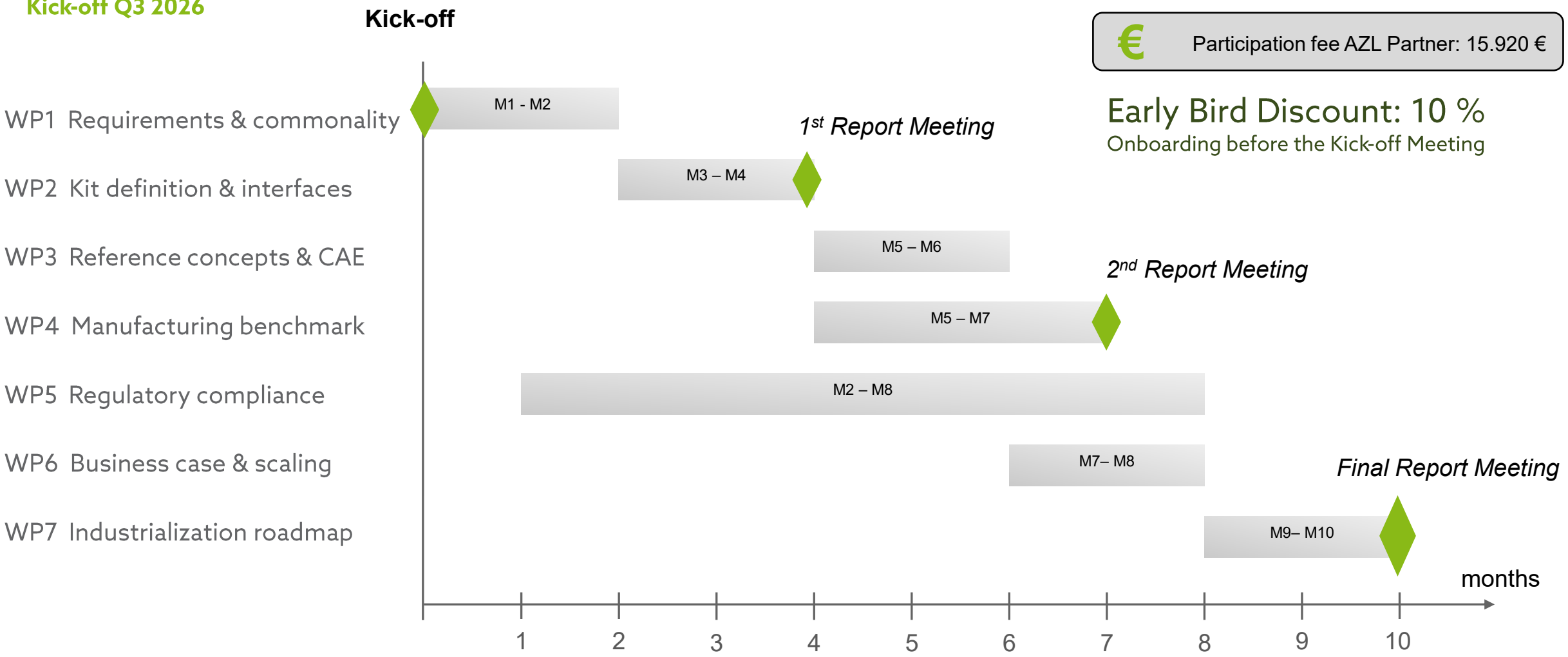

CONTACT US WITH YOUR REMARKS AND QUESTIONS!




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