

Towards a smarter, lighter Europe: Aligning innovation for future opportunities

Identifying future funding priorities to accelerate lightweighting innovation and align cross-project synergies for greater European impact, insights from the SALIENT cross-fertilisation workshop, an ELCA-incubated Horizon Europe project.

Who was involved?

16 Horizon Europe projects on lightweighting spanning advanced materials, sustainable manufacturing, digital tools, and circular strategies, came together for a workshop to map shared challenges, surface emerging solutions, and identify future funding and policy needs to support systemic change.



The process

Participants were grouped based on shared KPIs across their projects.



- Reduction in CO2 emissions
- Increase in material recovery and reuse
- Weight reduction



- Increase in manufacturing yield or efficiency
- Cost reduction
- Improvement of mechanical and thermal properties



- Increase of awareness
- Bio-based content



What are the main drivers behind these projects?

Some of the projects are working towards...

- Cutting carbon emissions by up to **40%** through innovative solid-state joining of steel multi-material and hard-to-weld joints — equal to preserving **304,000 km²** of forest (the size of Italy).
- **85%** material recovery using bio-based composites in aircraft wings and engines — avoiding landfill of over **900** fully-loaded garbage trucks per year in Europe.
- **42%** weight reduction in vehicle front-end structures using carbon-fibre reinforced thermoplastics — cutting CO₂ emissions equal to those of nearly **3 million people** annually in Europe.
- **20%** reduction in lead time for producing multi-material metal structures in the mobility sector through advanced digital technologies, saving nearly **2 months** of annual production time for critical components like EV battery housings.

What key technologies were identified?

Composite Materials & Lightweighting



- Use of multi-material structures, glass fiber and carbon fiber composites
- Lightweight design with weight reduction solutions (up to 50%)

Sustainable & Biobased Materials



- Green resin formulations for easier recycling and remanufacturing
- Use of flax fibers for automotive applications (50–80% biobased content)

Manufacturing Process Optimisation



- Digital tools (digital twins, machine learning and virtual testing) to design, test and optimise manufacturing processes

Circular Economy & Recycling



- Circular design strategies with improved LCA (life cycle assessment)
- Reduction of materials to landfill

Joining & Assembly Technologies



- Reversible joining techniques (e.g., smart adhesives), friction-based joining for multi-materials
- Resistant spot welding for automotive applications

Mobility & Vehicle Innovations



- Function integration for performance enhancement
- Crash behaviour improvement using AI-optimized designs

Relevant opportunities for 2026

Horizon Europe CL5 – 2026 call topics (Cluster 5: Climate, energy and mobility)

Focus of the call	Call topic code
 EV battery development	HORIZON-CL5-2026-01-D2-01 HORIZON-CL5-2026-01-D2-04 HORIZON-CL5-2026-01-D2-05
 Advancing sustainable transport	HORIZON-CL5-2026-01-D6-07 HORIZON-CL5-2026-01-D6-09

Lightweighting the future

Roadmap of lightweighting developments from 2021 to 2030

