

What is ENLIGHT

ENLIGHT is an EU collaborative research project aiming to advance highly innovative lightweight material technologies for application in structural vehicle parts of future volume produced Electric Vehicles (EVs) along four axes: performance, manufacturability, cost effectiveness and lifecycle footprint.

The key objectives are on holistic and integrated conceptual design and manufacturing concerning how the technologies and materials addressed can be combined into a representative medium-volume EV destined to reach the market in the next 8-12 years. This design is targeted to have a 20% additional weight reduction compared to the targets that are pursued in the complementary ALIVE proposal.

SEAM

ENLIGHT is part of the SEAM cluster of automotive EU R&D projects.



In order to coordinate and harmonize the four projects SafeEV, ENLIGHT, ALIVE and MATISSE, the SEAM cluster has been established.

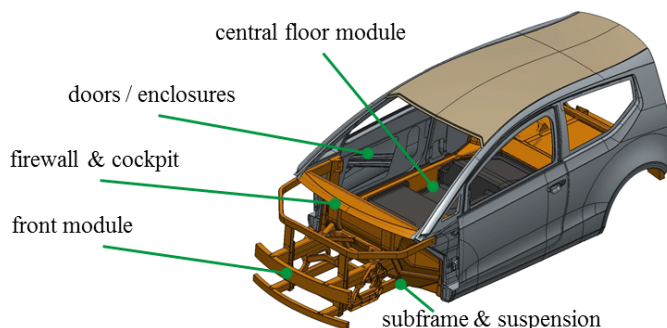
Main purpose of the SEAM cluster is to realize and monitor synergies between the four projects on RTD and demonstration level and to execute joint dissemination and exploitation activities.

The joint dissemination and exploitation activities are coordinated by the SEAM cluster office, which is hosted by the Fraunhofer LBF and Bax & Willems Consulting Venturing.

Motivation

Over recent decades, cars have become larger and heavier with every new generation. The main drivers of such a weight increase have been the improved safety and comfort requirements. This applies equally to the EVs mainly because in practically all cases they represent a derivative of a conventional powered model. However the need for weight reduction in future EVs, without unduly compromising performance and safety, is even stronger since additional weight translates into either reduced driving range or in larger, heavier and more expensive batteries.

However striving for reduced weight as the only objective will not necessarily result in a reduced environmental impact of the EV fleets of the future: Another two key and equally important drivers need to be pursued at the same time, namely affordability and life cycle impact minimization. Affordability is essential since it will allow for larger portion of the total EV fleet to adopt specific light-weighting solutions; and Life Cycle Impact effectively defines the total CO₂ impact over the lifetime of the vehicle, including the intrinsic CO₂ emitted prior to the use-phase of the vehicle.



Project Objectives

ENLIGHT advances innovative lightweight & low embodied CO₂ materials and their related design, manufacturing & joining capabilities suitable for automotive industry which requires unique levels of affordability, mechanical performance and ecology. The project innovates computer-based as well as experimental validation approaches (and their combinations) to allow for a fast, efficient and reliable design process. ENLIGHT validates the solutions by means of physical demonstrators to be evaluated experimentally in combination with a full vehicle virtual design and simulation.

Key deliverables of the project include:

- highly innovative lightweight / low embedded CO₂ materials for their application in medium-volume automotive production
 - thermoplastic matrix composites
 - fibre-reinforced composites
 - advanced hybrids and sandwich materials
 - bio-materials and renewables
- design capabilities for affordable medium-volume lightweight EVs
- manufacturing and joining capabilities for affordable medium-volume lightweight EVs
- experimental and simulation validation environments to enable rapid & reliable multi-parameter optimization when designing with these new materials
- LCA and economic analysis taking into account all salient factors
- 5 full scale demonstrator modules, covering different distinguishing features of purpose-designed EVs



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7.1 million euro (funding)

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Partners



ENLIGHT

Enhanced Lightweight Design

