

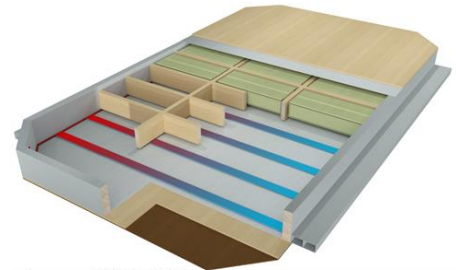


## MSc/BSc Thesis – Investigate innovative sustainable materials for crash structures

### Background

Li-Ion battery cells significantly influence the crash safety of an electric vehicle. E-Motorcycles are particularly affected by this because of the missing deformation-free zones. Therefore, crash structures can reduce the loadings and deformations on battery cells in case of a crash.

To make electric vehicles more sustainable, conventional materials (aluminium, plastic composite) should be replaced by alternative materials (e.g. biopolymers, wood). The material selection subsequently influences a component's manufacturing (e.g. casting, milling), assembly, and disassembly (e.g. welding, screwing).



Source: FFG BioLIB  
[www.innovationszentrum-weiz.at/](http://www.innovationszentrum-weiz.at/)

**Your goal** in this thesis is to identify promising alternative materials and investigate their suitability as crash structures in e-motorcycle traction batteries.

### Tasks

- **Get familiar** with the subjects of crashworthiness performance of green composite energy absorbing structures.
- **Understand** the architecture of a traction battery and its deformation behaviour in case of a crash.
- **Develop** crash structures that enhance the sustainability of electric motorcycle.
- **Implement your ideas** in a traction battery concept and perform a feasibility study.
- **Cooperate** with renowned industry partners.

### Desired qualifications:

- Interest in the research area of E-Mobility
- Structured and independent way of working
- Very good knowledge of English; knowledge of German would be an advantage

### Recommended as

- Master thesis for Mechanical Engineers
- Bachelor thesis is also possible

### Organizational

- **Start:** March 2023
- **Scholarship:** min. € 2.500,- for successful completion of the master thesis. No scholarship for bachelor thesis.
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