

# Bachelor-/Master thesis

## *Energy efficiency of tab-cooling of batteries for delivery trucks*



### Initial situation:

In the LiVe project, a novel battery system has been developed with pouch cells and tab cooling for heavy-duty trucks (BEV, HEV, High voltage line connection).

In this context, a cooling system has been laid out with the simulation tool AMESim, and its control strategy has been implemented in Simulink. The co-simulation of both the system and the control strategy showed that the cooling system is far quicker to react to changes in battery load than traditional surface cooling systems, and this could be used to improve the energy efficiency by using adaptive strategies.

### Objective of the thesis:

- (1) Given the current co-simulation model assess the energy efficiency and compare it to a

traditional surface cooling systems in the relevant use cases

- (2) Identify the parameters, which improve the energy efficiency of the tab cooling and find the optimal combination within the boundaries of feasibility
- (3) Given the characteristic use case of a delivery truck (predictable route, predictable load, pre-conditioning during charging), develop control strategies which make use of the quick reaction time of the tab cooling system

### Requirements:

- Understanding of the underlying technical problems and creativity
- Knowledge of AMESim or Simulink, and willingness to learn both
- Interest in electric mobility
- Motivation and effort

- Capability to both work independently and in team

### What is offered:

- Comprehensive supervision
- Relevant problems to the industry
- Knowledge in the development of electric powertrains

### Have we sparked your interest?

Please send your transcript of records, CV and certificates to the e-mail address below.

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