Graz University of Technology

Institute of Automotive Engineering

Master Thesis:
Environmental and feasibility assessment of diesel and battery-electric trucks in forestry logistics

In the FutureWoodTrans project, innovative concepts for sustainable forestry logistics are being developed. This master thesis contributes directly to this research by analysing the environmental performance and feasibility of diesel vs. battery-electric trucks operating under different forestry conditions.

The work builds on unique, high-quality field data collected in forest environments (energy consumption, load cycles, terrain effects) and expands the analysis into a full life cycle assessment (LCA), from production to end-of-life. This thesis is ideal for students interested in sustainable mobility, LCA, energy systems, transportation engineering, or environmental modelling.

Research topics:

- What are the environmental impacts of diesel and BEV trucks in forestry operations?
- How do terrain, weather, and loading patterns influence energy use and CO_2 emissions?
- Under which operating conditions can BEV trucks outperform diesel trucks in sustainability terms?
- What are the economic and operational feasibility implications for forestry logistics?

Methods:

- Life cycle-based assessment using data from literature and/or LCA databases.
- Use of the project's field data for energy consumption and load cycles in the real-life case.
- Sensitivity and scenario analysis (different use cases).
- Feasibility assessment and cost comparisons.

Duration:	6 month
Start:	As soon as possible
Workplace:	Institute of Automotive Engineering
Compensation:	A renumeration of € 3000 after successful completion of the master thesis project

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