



Shell Technology Center Hamburg

## **Modeling of a BEV Featuring a Single Thermal Fluid Loop for Immersion Cooling of Battery and Drivetrain Components**

Master Thesis in the Field of Energy and Vehicle Engineering

### **About Us**

As part of Shell's global technology development network, our scientists and engineers are actively working to reduce society's carbon footprint, lower emissions from energy products, and deliver competitive, high-performance solutions for our customers.

The Shell Technology Centre Hamburg (STCHa) collaborates closely with other Shell research hubs in the Netherlands, USA, China, India, the UK, and Japan. Together, this global community of more than 3,000 scientists, researchers, and engineers is dedicated to advancing technologies that meet the evolving needs of mobility and industrial sectors.

### **Your Thesis Topic**

You will support the development of a high-fidelity, physics-based simulation model of a battery electric vehicle (BEV) that uses a single thermal fluid loop for immersion cooling of both the battery pack and drivetrain components (e-motor, inverter, gearbox).

Leveraging existing GT-Suite sub-component models, your work involves integrating these elements into a complete vehicle-level thermal system. The resulting model will be used to study thermal fluid behavior, lubricant performance, heat generation, system interactions, and cooling effectiveness across demanding real-world driving scenarios.

This project offers hands-on experience at the intersection of thermal management, e-powertrain engineering, and advanced simulation, contributing to the evaluation and optimization of next-generation cooling and fluid concepts for future electric vehicles.

### **Your Profile**

- Enrolled in a technical master's program
- Motivated, independent, and curious
- Interest in BEVs, thermal systems, or vehicle modeling
- Basic experience with GT-Suite, Python, or MATLAB is a plus

### **What We Offer**

- Work within a cross-disciplinary R&D team developing advanced simulation tools
- Clear project scope, guidance, and mentorship from experienced engineers
- A flexible and collaborative work environment
- Practical experience in state-of-the-art BEV thermal and system modeling

### **Contact**

Toby Rockstroh, PhD | [toby.rockstroh@shell.com](mailto:toby.rockstroh@shell.com)