

Research Project Opportunity for Semester Thesis

## Life Cycle Assessment and Modeling of Thermal Energy Storage Fluids and Tank Materials Across Development Stages

We are looking for enthusiastic students to join our research team starting February 1, 2025. This project offers a chance to explore cutting-edge research in Thermal Energy Storage Systems using life cycle assessment methodologies. The focus is on evaluating the energy, environmental, and economic performance of storage fluids and tank alloys across different development stages, from the previously popular thermal oil storage in carbon steel tanks to the currently prevalent nitrate-based storage in stainless steel tanks, nitrate-based storage with corrosion protection, and potentially future-oriented chloride-based storage in high-temperature alloy tanks.



**Project Description:** This research primarily involves modeling and assessment, supplemented with literature reviews and experiments if necessary. Key tasks include:

1. **Goal and scope definition:** Defining the objectives and scope of the assessment, followed by modeling the systems under study and segmenting the functional units.
2. **Data collection:** Establishing a reliable and comprehensive database.
3. **Assessment:** Identifying major influencing factors and quantifying the results.
4. **Validation and outlook:** Verifying the findings with experimental data and analyzing future trends in energy storage.

**We are looking for candidates with:**

1. A background in Energy Engineering, Chemical Engineering, or Mechanical Engineering.
2. Solid experience in **life cycle assessment (LCA)** methodologies.
3. Proficiency in data analysis and 3D modeling.
4. A strong interest in renewable energy and environmental sustainability.

**What we offer:**

1. Access to both laboratory and industrial-scale research insights.
2. Comprehensive scientific guidance throughout the project.
3. A collaborative and supportive working environment to ensure high productivity.
4. Opportunities for international collaboration with a diverse research team.

**Contact Information:** If you are interested in joining this exciting research project, please contact:

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We look forward to your application and welcoming you to our team!