Screening life cycle assessment of wood-based batteries

Project description
Batteries are a vital part of electrification. However, based on battery chemistry type, materials used in production can be scarce, thus jeopardizing future supply of raw materials. A way to mitigate this is to use renewable raw materials for battery component production, such as materials derived from wood. Little is however known about their other environmental impacts. Life cycle assessment (LCA) is a possible way to explore the environmental challenges and benefits from using wood-based batteries.

In this thesis, we want to explore which possible wood-based battery chemistries there are and what their benefits and challenges are.

The following tasks are included:
- Make an inventory of battery chemistries that use materials derived from wood or wood components
- Make a rough assessment of their respective environmental impact using LCA
- Identify main benefits and challenges, with focus on environmental impacts
- Identify methodological challenges connected to assessing batteries with wood based components using LCA

The project will be conducted at the division of Environmental Systems Analysis at the department for Technology Management and Economics during the spring of 2023.

Qualifications
This project is ideally done by two students; however, one student is acceptable. We expect the student(s) to have a background in electrical engineering, chemical engineering, mechanical engineering, or similar. We welcome students from the master’s programs Industrial Ecology or Sustainable Energy Systems. Basic knowledge in LCA is preferrable but not mandatory.

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