

Assignment 1a and 1b

The material requirements of electrifying aviation

Problem statement

Electrification of aviation requires specific materials, most of them classified as critical raw materials by EU regulations. In order for electric aviation to scale-up, it is necessary to examine the environmental, regulatory and economic implications of this increased demand for critical materials.

Research question(s)

1. What critical raw materials are used and what quantities are needed for a full electrification of aviation? What is the environmental impact of this transition?
2. Circularity could ensure the necessary material supply by supplementing primary materials with secondary raw materials. But what regulations and business models are needed for this to happen?

Suggested academic backgrounds

- Industrial Ecology (TUD/Leiden)
- Aerospace engineering (TUD)
- Management of Innovation (EUR)
- Global Business & Sustainability (EUR)
- Engineering and Policy Analysis (TUD)

Expected type of work

For RQ1, material inventorying and flow analysis. For RQ2, study of the legislation, business-case and availability for retrieving these required materials as secondary materials. Two different students can take each RQ.