

## **Creative design(s) from EOL aircraft parts and materials**

*Repurposing and reusing aircraft parts and materials into new products.*

### **Problem statement**

Many aircraft parts are designed for a predefined lifetime. This design lifetime can be limited by e.g. the number of use cycles, certification, economic or even branding considerations. As a result, the materials and parts are often still in sound physical condition to use in another application. In very few cases, products are repurposed and considered for alternative reuse. For example, turning the cockpit into a simulator, or using a wing section as table or building roof. However, these examples fall short of using the unique material qualities effectively, hardly contribute to processing the volume of end of life aircraft materials, and do not communicate the potential for such reuse.

In this project, we challenge you to find inspiring applications that effectively use the structural qualities of aircraft components. These components are made of specialist materials, such as composites and aluminum alloys. They also feature special layups and stiffening structures such as ribs. Recycling such parts usually start by shredding them down, thus losing all those highly engineered and valuable characteristics. Therefore, the goal is to find applications that preserve the component structure and shape, but use them in another application. We need a role model to showcase the potential to stimulate reuse and repurposing of aircraft structures!

### **Research question(s)**

How to reuse aircraft parts, structures and materials into new products?

- Which materials, structures and parts are available for reuse, repurposing etc.?
- What are the structural, geometric, etc. properties of these materials & parts?
- What new product(s) could be a role model in the context of aviation?
- What is the economic potential and environmental impact for reuse?

### **Expected type of work**

Design, prototyping, assessment of market potential and environmental impacts.  
Methods, ie. Material driven design, repurpose design, circular design strategies

### **Available data/reports or other relevant information sources for the assignment**

- Joustra J, Flipsen B, Balkenende R. Structural Reuse of High End Composite Products: a Design Case Study on Wind Turbine Blades. Resour Conserv Recycl 2021.  
<https://doi.org/10.1016/j.resconrec.2020.105393>.
- Some repurposing examples: <https://www.aerotiques.co.uk/>

### **Commissioner details**

This assignment is part of the THESIS LAB 2024-2025: GREEN SKIES  
<https://www.centre-for-sustainability.nl/education/interdisciplinary-thesis-labs/current-labs-2425/green-skies-lab-2425>

**Enrolment for the 2<sup>nd</sup> semester (feb-jun 2025) is open!**

**Applications close on November 24th, 2024 (23:59)**



### **For more information, contact**

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