

Project Brief TU Delft

Supervisory team: Erik Tempelman, James Broadhead, Arnd Schirrmann

Title: Designing Decisions

Introduction:

Airbus is working with the Leiden-Delft-Erasmus Centre for Sustainability on circular aerospace research and see issues with the way funds are allocated for sustainable projects and how to tackle the difficulties related to sustainable aviation and decision-making both on a governmental and on a corporate level.

In a world increasingly conscious of environmental concerns, the aviation industry is under growing pressure to transition towards sustainable practices. This transition is not just a matter of environmental responsibility; it is also a potentially compelling (or just as potentially dispelling) financial imperative for airlines, airports, policy makers, and the aerospace manufacturers that supply them. In this context, Airbus, as one of the major stakeholders in the aviation industry, is at the forefront of these sustainability efforts.

This thesis aims to address a critical research gap in the sustainable aviation and economic/design domain. While there is an abundance of research into sustainable propulsion efficiency and an equally as abundant library of Microsoft Excel templates for economists wishing to conduct cost-benefit analyses, there is a simultaneous lack of research in the CO₂ and monetary cost of transitioning airports to sustainable propulsion infrastructure, likewise a lack of comprehensive standalone tools tailored to make the creation of cost-benefit analyses more transparent and comprehensible for a broad spectrum of stakeholders.

This project is not only significant for Airbus but also for airports, airlines, and policy makers looking to navigate the complexities of transitioning to sustainable aircraft propulsion. Furthermore, the tool's emphasis on visual clarity and ease of use aims to ensure that the tool is not industry-specific, hopefully allowing designers and economists in various fields to utilize it in the future.

Problem Definition:

The main problem to be addressed is a fundamental problem within Economics itself. Economics is meant to be a cold hard search for truth, but when it comes to experimentation based on evidence, there is only one economy to play with, which means a significant lack of theory testing. We therefore build models and try to create scenarios as best we can, however in doing so, implicit bias is always introduced. This bias is in the form of how calculations are made. The cost of 1 tonne of carbon, for instance, can be the market price based on the ETS credit system, or could be the social cost of carbon in its various assumed forms. These implicit biases skew results, and more importantly, influence the readers who interpret the results. The goal is to make a tool that forces stakeholders to engage with the data in such a way that they get a broad overview of how the costs have been calculated, thereby allowing for more individual interpretation of the data with less chance of implicit bias being passed on.

Assignment:

Design and investigate a user-friendly prototype tool to improve communication between designers, economists, manufacturers, and policymakers in the context of sustainable aviation.