*Main thematic area:* Economics/Science/*Technology*
*Cost:* £/ff/fff

# Prioritisation of airframe and engine technologies

**Objective**
This study examines the impact of advances, improvements and changes in both engine and airframe technology and assesses them in terms of their potential to mitigate the environmental impact of aviation. It will indicate which technologies offer the best improvements when all the relevant issues are considered.

**Background**
The list of candidate technologies that could reduce aviation's environmental impact is large. However, it is difficult to quantify the net realisable benefit of an improvement in a single characteristic at the system level that includes the airframe, the engine and the atmosphere. The challenge is to identify those technologies that offer the largest, or the quickest or the most cost effective benefits in terms of a range of specified environmental impacts.

This study uses a simple, accurate, analytic system model capable of estimating the overall impact of a given improvement in technology. The output is tailored to provide support for the planning of future research and development programmes for aerospace technologies.

Examples in the areas that will be assessed include the implementation of carbon fibre structure, improvements to high lift systems, improvements in transonic aerofoil design, drag reduction technologies, improved propulsive efficiency, improved combustion and engine component technology. The output will be judged in terms of a number of target metrics eg fuel burn per passenger seat mile and payload fraction.

Other optimisation parameters, such as NOX production and propensity to form contrails, may be generated in the course of the study.

**Knowledge transfer**
An important impact of this study will be the development of a set of technological pathways and strategic responses that could form a framework for further informed discussion between industry representatives and policy-makers, as to the likely impact of different policy options.

The uptake of different technological options for reducing the environmental impacts of aviation depends significantly on the extent to which these make commercial and strategic sense for actors within the aviation industry, including manufacturers, airlines and airport operators. It is vital to develop a realistic understanding of the possible range of responses by firms in the aviation industry to the incentives that policies will create. These responses would include decisions on investment in new technologies for aircraft.

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