

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

Emissions and impacts of supersonic bizjets on the atmosphere

Background

The environmental impact of any supersonic aircraft will be of significant public concern, as research dating back to the late 1960s highlights concerns over their effects on ozone depletion and climate change. Thus, the sensitivity, even to a potentially small fleet of supersonic business jets (SSBJs), will be high.

SSBJs are under initial design consideration by a number of manufacturers, including Aerion and Gulfstream, possibly adapting existing engine technologies. The European Commission has funded a technology design programme, 'HISAC' to investigate the technical feasibility of an environmentally compliant SSBJ. SSBJs are 'on the table' as a serious technological and commercial proposition.

Previous studies (e.g. IPCC, SCENIC) have highlighted that flying in the stratosphere can result in potentially large radiative impacts from water vapour, injected into the dry stratosphere. In this respect, 'impact' through residence time is vitally controlled by cruising altitude and, to a lesser degree, speed. Ozone depletion issues also need to be considered.

Study objectives

No evaluation of the atmospheric impacts of SSBJs is currently being undertaken. The objective of this project is to deliver parametric studies of the impacts of

additional emissions of NO_x , water vapour and CO_2 on the mid-stratosphere and determine the sensitivities to height of emissions.



Study outputs and benefits

The study will bring together technologists, emissions specialists, climate scientists and policy developers. Exposure and examination of study work by the industry is planned to involve the stakeholder community.

In addition, the study will be of importance to UK Government policy developers involved in the international ICAO-CAEP forum as a better understanding of the acceptability of second-generation supersonic aircraft is needed.

An understanding of the cruise height implications of SSBJ emissions will also assist the design of this new generation of aircraft.

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