



“The Future of Aviation”

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Title

Future Short and Medium Range Aircraft Configurations

Abstract

The short and medium range sector is currently dominated by only two aircraft families, the A320 and the B737. Both are currently receiving updates to their engines and aerodynamics, and will most likely remain in production for at least another decade. Studies show that retrofit of newest engine technology and some other innovations allow current aircraft to remain very efficient.

In order to achieve the desired savings in energy consumption, a radical departure may be required. This not only affects the aerodynamic configuration of the aircraft, but also the way it is operated. Most technologies have beneficial effect in specific areas (for example lower drag, or lower weight), but once integrated the advantages shrink or disappear completely. The analysis is further complicated by the fact that many technologies interact with each other.

The DLR institute for air transportation systems aims at finding integrated solutions. The short and medium range sector offers a variety of technologies capable of achieving the objective of lower energy consumption. A number of them are analyzed and integrated in configurations that might be introduced from 2030 onwards. Some technologies may require a departure from current specifications.

The research of integrated aircraft concepts requires sufficient resources and capabilities. It is very difficult in publically financed research to assemble a team of highly experienced aircraft designers and keep them over a period of time. The DLR as leading research institute in Europe does have many capabilities within its many disciplinary institutions. Via a collaborative design environment the experts from other institutions are integrated into the design effort, thus allowing the incorporation of better models and more experience.

The quest for future aircraft happens on average desktop computers, so hardware availability is no issue. The main challenge is to compete successfully for expert knowledge and being able to integrate it into

one's design project. Although tools may be accessible via common file formats, any advanced engineering tool requires experience and engineering judgment to interpret its results.

The mission of the institute is hence both technical (researching new aircraft) and organizational (establish new methods). The main mission remains to take part in the Future of Aviation.

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