



# Environmental Technology Aerospace Innovation Network (Env Tech AIN)

## Introduction

Improving the environmental performance of aircraft is critical to the long term sustainability of the aerospace industry. The Aerospace Innovation Network (AIN) for Environmental Technology will research advanced concepts in:

- Technologies and design approaches which support achievement of the ACARE goals for 2020 for civil aircraft (baseline – year 2000 operations) :
  - 1) 50% reduction in CO<sub>2</sub> emissions per passenger km.
  - 2) Half current perceived average noise levels.
  - 3) 80% reduction in NO<sub>x</sub> emissions.
- Technologies for minimising the effects of visible exhaust emissions and noise emissions from military aircraft, including small-scale particulate emissions.
- Step change developments in both and airframe design.
- Improving local air quality and noise near airports, for passengers and cabin crew within the aircraft and for support staff on the ground
- Reducing dependence on scarce minerals and compounds and increasing sustainability.

A series of AINs were established as part of the National Aerospace Technology Strategy (NATS) by the DTI sponsored Aerospace Innovation & Growth Team (AeIGT), to facilitate co-ordinated applied research. The Env Tech AIN contributes to the AeIGT themes of aerodynamics and propulsion, advanced structures and materials and autonomous control and management systems. There will be complementary interaction with other AINs, particularly those in High Temperature Materials, Aerodynamics, and Advanced Materials and Structures. The Env Tech AIN will be involved with integration of promising individual technologies into viable sub-components, to be ready to feed into future Aerospace Technology Validation Platforms.

## Research Themes

The research themes have been identified as:

- Noise : Enhancement of design methods, structures and machinery to alleviate noise (e.g.; Powerplant : fans, turbines, exhaust system, acoustic liners. Airframes : nacelles, wings, high lift systems, undercarriage, engine installation). Development of novel active noise control technologies.
- Powerplant efficiency : Step change increase in efficiency / reduction in fuel consumption through improved engine operating cycle and improved aerodynamics / reduced drag. Reducing dependency on rig testing by improving simulation and modelling (cost and lead-time benefits).
- Emissions : Creation of design rules for lean burning systems including understanding of fuel / air mixing. Implementation of mechanisms for reliable altitude reflight, pullaway and operability. Understanding the potential of alternative fuels.
- Whole aircraft issues : airframe – powerplant integration, airframe efficiency, novel concepts and architectures.
- Operational procedures : alternative ways to operate aircraft on the ground and in the air, to reduce environmental impact.

## Benefits

The programme will engage industry, the supply chain, universities and funding partners, such as EPSRC, DTI, RDAs and MOD. It will work closely with the other AINs and ATVPs, to fully exploit developing technologies and ensure they are pulled through from the science base, to be embedded in the supply chain. This is to be achieved by developing facilities and demonstration of capability at the leading edge of the global aerospace industry. It will also link to strategy review bodies including OMEGA, Sustainable Aviation and Greener By Design, acting to translate their guidance on technology and policy options into specific research and technology programmes.

UK industry has the capability to harness and deliver on this investment by working together with the Government and the Regional Bodies to continue to develop an increasingly robust aerospace industry. Industrial partners can hope to develop their forward looking strategy and capability, with accompanying strengthening of local economies. In addition, multiple cross-sectoral benefits can be achieved through exploitation of technology / capability into other areas. The nominated industry lead company for this programme is Rolls-Royce plc.

## Status

The programme is in the process of being launched, with a Kick Off Meeting arranged for 14 May 2007, to which all partners will be invited. Incorporation of feedback from this workshop event will lead to the initial Baseline applied research programme and subsequent focused funding proposals.

## Contact

If you are a UK based company with funded technology programmes which could help the Environmental Technology AIN reach its goals and are interested in becoming part of the AIN consortium, please contact :

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