



AeroAfrica-EU

Promoting European
and South African
research cooperation
in aeronautics and air
transport



WHAT IS AEROAFRICA-EU?

The European Union (EU) and South Africa (SA) recognise the importance of the aeronautics sector as a driver of innovation and competitiveness across industry. The AeroAfrica-EU consortium seeks to optimise its resources, partnerships and networks so as to promote active research and development cooperation between the EU and SA in aeronautics and air transport, whilst exploring the potential for participation of other African organisations. In this way, the consortium hopes to contribute to solving global aeronautics challenges.



AEROAFRICA-EU OBJECTIVES

The main objectives of the project are to:

- increase African participation in the aeronautics and air transport activities of the EU's 7th Framework Programme (FP7)
- raise awareness in Europe of African, and particularly South African, aeronautics R&D expertise
- develop networks and partnerships between Africa and Europe in the aeronautics R&D community
- enhance cooperative relationships through the joint identification of needs and priorities.
- initiate R&D policy dialogue in aeronautics between Europe and Africa to support growth and development.

KEY ACTIVITIES

Mapping the aeronautics and air transport landscape

In order to facilitate collaboration, a mapping exercise was launched for the purpose of creating a database of SA/African aeronautics research capabilities with the objectives of:

- supporting and maximising collaborative relationships between EU and SA
- promoting the exchange of ideas and knowledge
- assisting in creating programmes of global significance
- nurturing scientific excellence.

Mapping Workshop

On 22 September 2009, organisational representatives attended the Mapping Exercise Consultation workshop at the Aerosud Innovation and Training Centre in Pretoria. The mapping process and the expected outcomes were explained, after which delegates were given the opportunity to comment and make suggestions.

Participants in the mapping exercise were identified across sectors so as to identify appropriate synergies between the EU and SA. The focus fell on major aerospace strategic research themes such as:

- safety and security
- air-traffic management
- environmental aspects
- innovative design and manufacturing
- future technologies and designs.

This exercise resulted in the creation of a South African Aerospace R&D catalogue and database.

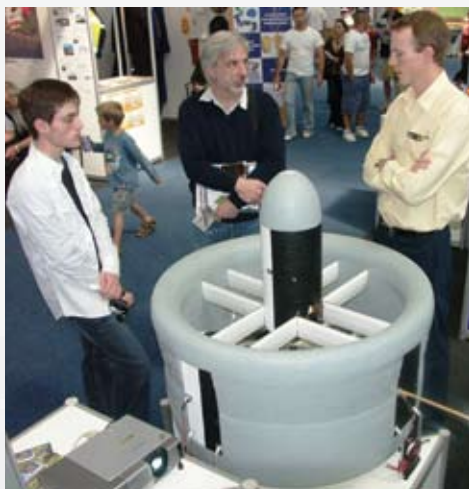


The South African Aerospace R&D database will continually be enhanced as additional information becomes available. It can be accessed via the project website or a hard copy of the catalogue can be provided on request.

Two examples of organisations identified as part of the mapping exercise are as follows:

Organisational profile: The CSIR

The Council for Scientific and Industrial Research (CSIR) provides technology solutions to support sustainable development and economic growth in the context of national priorities. The CSIR have participated in the following FP projects: Sesar, FANTASIA, VITAL, FUTURE and FFAST (see selected project profiles in the FP7 section). The organisation has extensive expertise in a wide array of areas including aero-elasticity; aircraft modelling and simulation; NDT research; vibration measurement, structures and UAV development; design, modelling, synthesis, characterisation and fabrication of nanostructured materials; development and analysis of fibre and textile-based materials; expertise in non-woven technology; polymeric reinforcement; development of laser technologies; numerical, experimental and structural aerodynamics research; turbomachinery design and analysis; energy systems; CFD and wind-tunnel testing; research and creation in metals and alloys; smart structures and materials; as well as passenger transport service design and delivery.



Stellenbosch University's exhibit at the Africa Aerospace and Defence 2006 event.

Organisational profile: Stellenbosch University

The Stellenbosch University's Centre of Excellence in Autonomous Flight (SUN) specialises in developing and implementing complex embedded control, automation and information systems. Some of the research programmes they have been involved in include autonomous failure detection and recovery; autonomous flight; takeoff and landing control of fixed and rotary wing aircraft; development of modular and integrated avionics; fault tolerant avionics systems with built-in redundancy; smart material control surfaces for improving fuel efficiency of Airbus A320 and UAV certification and regulation. SUN participates in the FP7 funded project FUTURE (see selected project profiles in the FP7 section).

Developing and enhancing networks and partnerships

There are various means of developing networks and partnerships within the aeronautics sector. The development of a website (www.aeroafrica-eu.org) has proved very useful in disseminating information, creating awareness around the role of AeroAfrica-EU and making important documents available to the aeronautics community. The AeroAfrica-EU Newsletter, **Aeroview**, will also keep interested parties informed of developments in the EU and SA aeronautics environment, and profile international and local roleplayers.

Various events in France, Belgium, Germany, United Kingdom and South Africa have actively promoted SA institutions and showcased project participation. These events have included presentations, exhibitions, workshops and technical sessions, which aim to identify areas of collaboration and identify potential projects.



Ruediger Braeuning, consortium partner and presenter from Fraunhofer is thanked by Japie van Wyk, Chair of the Technical Committee, at the International Aerospace Symposium of South Africa (IASSA) held in 2009.

AeroAfrica-EU and African aeronautics capabilities have been showcased at:

- AeroAfrica-EU lunch reception in Brussels, Belgium on 9 February 2010
- SAMPE Europe International Conference SEICO in Paris, France from 23 to 25 March 2009
- Journal and Exhibition on Composites Show JEC in Paris, France from 24 to 26 March 2009 (Fraunhofer booth)
- Aerospace Testing, Design and Manufacturing in Munich, Germany from 21 to 24 April 2009 (Fraunhofer booth)
- International Paris Air Show - Le Bourget in Paris, France from 15 to 21 June 2009 (Fraunhofer and Aerospace Valley booths)
- AeroAfrica-EU Launch and Brokerage Event in Brussels, Belgium on 22 June 2009
- EC FP7 Transport Days and ETNA Brokerage event and AeroAfrica-EU Networking Reception in Brussels, Belgium from 28 to 29 September 2009
- Composites Europe in Stuttgart, Germany from 27 to 29 October 2009 (Fraunhofer booth)
- International Aerospace Symposium of South Africa (IASSA) in Centurion, South Africa on 23 to 25 November 2009.



Participants at the "Aerospace Technology – Enhancing our Partnerships" special session, hosted and organised by AeroAfrica-EU on the first day of IASSA 2009.



High Level Advisory Group

A High Level Advisory Group, has been established, comprising well-known European and African experts from academia, industry and the research community to advance the project's objectives. This group advises on project activities; assists in identifying suitable and sustainable themes for R&D cooperation and acts as matchmakers in advancing African and European partnering, as appropriate. Profiles of the members will be available on the project website.

Consolidating and mobilising towards supporting EU FP7



SA is one of the principal and most effective Third Country participants in the EU Framework Programmes. Its participation in the 6th Framework Programme (FP6) proved to be most successful, with involvement in excess of 117 projects. SA was ranked fourth, behind the United States of America, the People's Republic of China and the Russian Federation, in terms of successful FP6 participation by non-EU countries.

SA was a first-time participant in the FP6 aeronautics and space transport priority areas as a member of the project consortia:

- African Satellite Communication and Galileo Applications (AFSAGA)
- Environmentally Friendly Aero Engine (VITAL IP).

SA researchers have also been successful in the first aeronautics transport calls in FP7 through participation in FUTURE, ALFA-BIRD and FFAST.

Future Fast Aeroelastic Simulation Technologies (FFAST)

In collaboration with 11 international partners, South Africa's CSIR has been working on the FFAST project funded under FP7. The project aims to develop, implement and assess a range of numerical simulation technologies to accelerate future aircraft design. Critical load identification methods and reduced order modeling techniques will potentially improve the efficiency and accuracy of the dynamic aeroelastic load process. Identifying the flight conditions that lead to the maximum loads on aircraft structures and introducing higher fidelity methods at these conditions will reduce the cost and turnaround time of the load process in conventional aircraft. This will lead to significant improvements in product development and manufacture. The target for the FFAST project is to demonstrate a speed of two to three orders of magnitude over high-fidelity methods. To meet this target, research will be carried out to improve identification of critical loads and develop reduced order modelling strategies for unsteady aerodynamic and aeroelastic simulation.



Flutter-free turbomachinery blades (FUTURE)

FUTURE brings together a host of international centres of excellence to undertake research which aims to develop flutter-free turbomachinery blades. Flutter-free turbomachinery blades will lead to decreased developmental cost, reduced weight and fuel consumption, and increased ability to efficiently manage flutter problems occurring on engines in service. The experiments performed will focus on unsteady aerodynamic properties. The acquired knowledge will be used by aeroelastic specialists to improve aeromechanical design rules. A sophisticated measuring technique will be developed, and a new excitation mechanism will be implemented as back-up to the free-flutter experiments. Furthermore, a unique database with combined structural and unsteady aerodynamic results will be established and made available for further dissemination among the partners. This database will contain significantly more detailed data than any other existing database in the world. The CSIR and Stellenbosch University are the South African partners in FUTURE.

Alternative fuels and biofuels for aircraft development (ALFA-BIRD)

ALFA-BIRD represents a multidisciplinary consortium established to develop a range of alternative fuels that will meet strict operational aviation constraints, such as flight in cold conditions, and ensure compatibility with current civil aircraft, which may have lifespans of almost 50 years. Co-funded by the FP7, the project was launched in July 2008, and will take its course over the following four years with a total budget of € 9.75 million. In the long term, the development of alternative fuels may assist in improving each member country's energy independence; lessen global-warming effects; and counteract the economic uncertainty caused by crude oil price volatility. The project's investigation of alternative fuels will revisit fuel specifications and reconsider the whole aircraft system from fuel to engine and the environment. The South African partner in the 23-partner ALFA-BIRD consortium is Sasol's Technology Fuels Research.



One of the key objectives of AeroAfrica-EU is to act as a facilitator for African aeronautics and air transport R&D players to participate in FP7 consortia. Call analysis workshops are held periodically to create awareness around FP7, provide an overview of AeroAfrica-EU as well as FP7 project processes and the Department of Science and Technology's (DST) supporting instruments (FP Seed Funding and FP Strategic Co-investment).

FP Seed Funding provides access to funding for South African FP7 participants to cover overseas travel costs should they need to meet with European partners to discuss potential FP7 projects. Funding can also be granted for European researchers to travel to South Africa.

Successful South African FP7 participants who do not receive full funding from the European Commission for their FP7 project costs - as is possible under the FP7 funding rules - can apply for FP Strategic Co-investment and receive funding for part of the remaining project costs from the DST.

Call Analysis Workshops

During 2009, two FP7 Call Analysis workshops were held in Pretoria and Stellenbosch to create awareness around the transport research call. Presentations made by NACoE, DST and Wits Enterprise provided information on AeroAfrica-EU, the FP7 Call Analysis, FP7 project processes and DST supporting instruments. Information gathered from these workshops was used to populate the mapping database as well as generate a presentation on partner profiles for the brokerage event hosted by the European Community and ETNA network in Brussels in September 2009.

Identifying and demonstrating mutual interest and benefit in R&D cooperation

The EU is one of South Africa's most important strategic partnerships. Collaborative initiatives in the economic, technological and developmental areas between the two parties have produced tangible benefits for both the Europeans and South Africans.

Agreements with international partners

One of the government's initiatives is the forging of multilateral and bilateral agreements with international partners. The agreements are intended to provide a framework in which S&T cooperation can be promoted by way of facilitating various activities such as joint research projects, exchange of scientists as well as mobility grants, support of workshops, seminars and conferences. SA and EU concluded the Agreement on S&T Cooperation in 1996. SA's cooperation with the EU also incorporates Africa-EU programmes; Africa, Caribbean and Pacific (ACP)-EU relations; South-South and South-North cooperation; international S&T policy forums; global sustainable development agenda, and global S&T projects. The DST currently has 11 such bilateral agreements with various European countries covering a wide range of scientific areas.

The AeroAfrica-EU consortium is working towards creating a policy framework to allow stakeholders in the aeronautics and air transport research environment to meet and discuss issues of relevance to the respective communities, identify areas of cooperation, and define mechanisms to foster greater collaboration.



CONSORTIUM PARTNERS

The AeroAfrica-EU partners are:



CONTACT US

Please contact us should you require further information or if you are interested in participation in any of the FP7 thematic areas.

General

Email: info@aeroafrica-eu.org

Website: www.aeroafrica-eu.org

AeroAfrica-EU

coordinator@aeroafrica-eu.org