EREA Newsletter – September 2012

EREA in Flightpath 2050

During the Aerodays 2011 in Madrid the High Level Group for Aviation Research published the new European Vision "Flightpath 2050". The challenging goals maintain European leadership and serving societies needs can only be reached, when all aviation research stakeholders work together along the guidelines provided by the Strategic Research and Innovation Agenda (SRIA) prepared by ACARE. In ACARE the national funded research establishments are, apart from industry, a strong contributor to the development and the implementation of the SRIA.

The leading aeronautical research establishments in Europe have created the organisation EREA as their common voice and cooperation platform. Currently involving full members from the Czech Republic, France, Germany, Italy, the Netherlands, Poland, Romania, Spain and Sweden, and with associated members from Austria, Belgium, Russia, and Switzerland, and one affiliate member from Poland, the organization employs some 9000 staff of which more than half are experienced scientists.

EREA is the organisation that makes the knowledge triangle complete. Universities work on fundamental research at low TRL-levels, EREA takes up and develops these results towards higher TRL levels delivering technology that can become final products by the industrial TRL 7-9. EREA and its members are therefore cooperating with universities and industries, typically the work of EREA focuses on TRL 3-6. There is no conflict between basic and applied research. All that is needed to make the full R&D process complete is the integration of the different steps in the research and innovation process and the completion of Technology Readiness Levels from the initial thought to the final product by integrating the different steps in the research and innovation process and by completing the Technology Readiness Levels from the initial thought to the final product.

EREA brings groups of experts, reaching critical mass, in aerodynamics, materials and structures, flight mechanics, propulsion, acoustics, avionics, flight testing, modeling and simulation, human factors, ATM and airports, aircraft operations, environmental aspects, safety, and security. EREA has long track record of European cooperation amongst each other and together with industry in order to reach European goals (Vision 2020, Flightpath 2050). Therefore EREA members are well known partners in the EU framework programmes, as well as in the JTIs Clean Sky and SESAR.

EREA provides to Europe unique experimental facilities, including wind tunnels, flight test capabilities, air traffic management simulators, propulsion test rigs, acoustics chambers, and structures and materials test capabilities.

As non-profit organisations, representing the governments of the individual member nations, EREA is uniquely positioned to participate in Global Challenges as emission and noise reduction. EREA can actively bring expertise in all the technical fields needed to reach the long term goals for greener flights in 2020, and 2050, as outlined in Flightpath 2050 and the ACARE SRIA. Recently, EREA has published a report addressing the research needed to pave the way for the Air Transport System 2050 : from Air Transport system 2050 vision to planning for research and innovation.

EREA welcomes last call of FP7

EREA welcomes the last call for proposals in the seventh Framework Programme of the European Commission.

The annual calls for proposals in particular in the aeronautical and air transport programme have offered EREA the opportunity to enhance collaboration amongst its members and with industry partners and universities in Europe. Participating in European research projects made it possible to access the broad European knowledge base on aviation; an essential element for reaching innovation in an international sector such as aeronautics.

With the help of the European Commission EREA was able to contribute to the creation of an increasingly cost and time efficient, greener and safer air transport system in Europe.

EREA will continue this excellent collaboration under the new Horizon 2020.

EREA data 2010

- Intramural aeronautics research for R&T: 447 M€
- Annual Investments: 182 M€
- Annual revenues from EU projects: 55.5 M€
- PhD thesis: 1146
- Total number of publications: 8017
- Publications in refereed journals: 1144
- Total employees in the aeronautics fields: 5135
- Scientists in the aeronautics fields: 3176

Contact via : contact@erea.org

EREA position on Horizon 2020

General remarks

- EREA welcomes the opening of Horizon 2020 to **Research and Innovation**. The chosen three pillar structure (Excellent Science, Industrial Leadership, Societal Challenges) addresses very relevant political goals in the current social and economic scenario.

- Research and innovation needs a close cooperation of all stakeholders (academia, research organisations, SMEs and industry) in the entire research and innovation cycle. EREA would like to see the **entire research and innovation chain** supported by Horizon 2020, both in the entire programme, and in the individual pillars of the programme.

More specifically:

  - Industrially oriented research and test infrastructures should be part of the Research Infrastructure in Horizon 2020,
  - Small and medium sized research projects should be part of both the pillars for Societal Challenges and Industrial Leadership.

A possible separation of stakeholders according to pillars (for example excellence science for academia and research centre; industrial leadership for industry) will interrupt the needed cooperation and continuous transfer of knowledge from basic research up to innovation.

- EREA would like to see a mechanism **to link Horizon 2020 and the structural funds** in order to support and maintain European strategic research infrastructure, including those for industrial competitiveness.

Research on (Air) Transport

- EREA welcomes the **integrated approach on transport research** and the focus on societal challenges and industrial leadership. According to the successful experience in aeronautics:
  - Knowledge existing in one mode of transport can be transferred to other modes, e.g. materials and aerodynamics.
  - At the same time research and products in each mode of transport has its own characteristics and different dynamics, life cycles, standards, certifications. The s**pecific research challenges** of the different transport modes should be addressed. The intermodality should deserve the right attention without loosing the focus on the specific modes.
  - Research in air transport is characterised by long development times which is dealt with in an appropriate manner by the existing **funding instruments** differentiating between low and high technology readiness levels (L0 – L1 – L2 – L3).
  - EREA would welcome that Europe and in particular Horizon 2020 will use the **Strategic Research and Innovation Agenda** (SRIA) currently prepared by the Advisory Council for Aviation Research and Innovation in Europe (ACARE) as Guideline for designing the future programme contents. Specific elements should find space in all the pillars, (e.g. specific enabling technologies form the SRIA among KET of Industrial Leadership pillar).

Rules of Participation

- EREA welcomes the **simplification of the rules of participation** in Horizon 2020, but also notices that the new **funding rules** can have a negative impact for research establishments.
  - The total funding of 120% of the direct costs (100% direct + 20% indirect) **does not cover the large indirect costs of research establishments** which run large research infrastructures and do not have the possibility to get a return on investments like industry.
  - Lack of 100% coverage of the full **project management** costs will strongly discourage parties to lead research proposals.

- Horizon 2020 will give more attention to Public Private Partnerships (PPP's), such as Clean Sky and Green Cars. EREA would like Horizon 2020 to also include a so-called P2P instrument for **public-public partnerships**. P2P could foster the co-ordination between national research establishments through a **Joint Research Initiative**.
  - More co-ordination of national institutional research will lead to a stronger synergy of national and European research resources.
  - The creation of an instrument for a focused joint research initiative in Horizon 2020 will lead to a more structured public demand for research in Europe.

- EREA has taken and is prepared to take over lead positions within a **new Joint Technology Initiative on Air Transport** (Clean Sky 2).

Aviation Joint Research Initiative in Horizon 2020

The EREA Board elaborates on the idea of a Joint Research Initiative (JRI) for aviation. In a JRI the individual EREA members join efforts on research activities (programmes and/or facilities) currently executed within their national funded research establishments.

A JRI for aviation should cover the entire Air Transport System and its integration into the global transport system, in particular addressing inter-modality in terms of interfaces. This is in line with the Societal Challenge smart, green and integrated transport under Horizon 2020.

The European Council endorses the continuation of the current FP instruments. These already give the possibility to include the JRI into Horizon 2020 as a complementary initiative to the industry focused Joint Technology Initiative instrument. Nationally funded research organisations are envisaged to have a similar leading role in a JRI like industry has in a JTI.

A Joint Research Initiative for aviation should propagate the knowledge available within aviation and aeronautics that could also be of use for other modalities. In establishing links with other modalities, aviation should be taken as the starting point.

In general the JRI should work on long term solutions for societal demands in aviation (e.g. safety, eco-innovation, seamless mobility). Therefore it should focus mainly on the lower technology readiness levels (TRLs 1-2-3-4), whereas the JTIs already focus mainly on the higher TRLs.

This joint European effort should result in more aligned, more cohesive and efficient national institutional research in aviation and should bridge the basic research and knowledge available at universities with the research performed by industry.

EREA view on Clean Sky 2

The current framework programme recognises the specificity of aeronautics characterised by a long research and innovation cycle and by the need of activities ranging from basic research up to demonstration.

The current instruments in FP7 successfully cover the full scale of technology readiness levels: L0/L1 are focussing on lower technology readiness levels, L2 on integration projects, and L3 instrument (e.g. Clean Sky) brings research results up to demonstration in real scale and operational environment. Public Private Partnerships initiated in FP7 for transport, such as the Clean Sky Joint Technology Initiative, have proven to be and important and efficient instruments for demonstration and should be continued.

The L0-L1-L2-type of projects should remain under the Commission responsibility in Horizon 2020, continuing the current FP7 approach.

A successor of Clean Sky is under preparation aiming to:

- reinforce the demonstration activities for innovative technologies and radically new configurations
- reduce the risks of new product development.

In order to bring the technologies up to the highest level of maturity, different steps are needed:

- Validation and demonstration at technology level; thus testing on ground with specific laboratories and facilities is required.
- Validation and demonstration of integrated technology; both on ground testing and demonstration with technology integrated in aircraft demonstrators are needed.
- X-demonstrators - Demonstrators with breakthrough technologies integrated in radically new configurations.

Clean Sky 2 should rely on a quantum step in R&TD and innovation and will have to cover all these steps in order to facilitate the market take up of innovative technology.

EREA is ready to support validation and demonstration in the different phases:

- o numerical test campaigns, design and optimization studies;
- o virtual testing (multidisciplinary simulation, product testing and verification, certification aspects);
- o test campaigns with relevant research and test facilities;
- o full integration and demonstration test by a demonstration aircraft; EREA might take over the full operation of a research aircraft.

CS2 and collaborative research type of projects should complement each other with respect to the addressed TRL; thus, topics within the CS2 perimeter should also be open to collaborative research type of projects.

EREA view on SESAR 2

EREA believes it can bring great benefit in participating in the definition phase of future SESAR research areas. EREA supports the proposed deployment phase, funded via the Connecting Europe facility. At the same time the Research and Development process should also continue under Horizon 2020 in order to prepare the next building blocks for SESAR Deployment and the time beyond SESAR.

There should also be a close connection between SESAR deployment and long term ATM research. The goals of future ATM research as well as SESAR deployment including the underlying ATM Master plan should fit into the Strategic Research and Innovation Agenda of ACARE. Finally, an efficient operation of the future ATM R&D (innovation) scheme includes making maximum use of existing facilities and knowledge already available in the Member States.

Research and Development in the new ATM research and deployment scheme

The R&D process should be split in three phases. The first phase, Exploratory Research, will facilitate „competition of best ideas“, based on a broad range of sources. The second phase will be solid R&D and the third stage will focus on pre-industrial Developments.

In the Exploratory Research phase, there should be an 80% share for research and involvement in the programme and a 20% share for Industry. In the Applied Research phase research and industry should equally share the voting rights and involvement in the programme and in the Pre-industrial Development phase industry should have an 80% share and involvement in the programme and research a 20% share.

Participation and budget

Participation in individual research projects should be open through open calls for proposals in order to fully utilize the knowledge potential available in the Member States. A total budget of about 700 million euros is needed for the 7-year R&D process under the new ATM research and deployment scheme.

Out of this budget 20% should be allocated for exploratory research, 40% for applied research, 30% for pre-industrial development and 10% for the technology evaluator mechanism. For reasons of simplification the new ATM research and deployment scheme should apply the same rules of participation and funding rules as Horizon 2020.

EREA and Security

EREA welcomes also the last call for proposals in the seventh Framework Programme of the European Commission in the security domain.

FP7 was the first appearance of a dedicated security work programme.

Based on their history of fruitful collaboration in aeronautics, EREA REs created a dedicated group - SRG: the security research group - for the preparation and follow up of the new security domain work programme.

Along the 6 calls of FP7, attendance and participation to the SRG has continuously grown up in the great ARG's shadow, extending cooperation between REs on topics such as security of citizens, security of critical infrastructures (airports,…), intelligent surveillance and border security and also restoring security and safety in case of crisis.

EREA view on international collaboration on Horizon 2020

The challenges to reach sustainable, clean, efficient and secure transport can only be solved on worldwide basis. In particular aeronautics and air transport are unthinkable without international collaboration. On the other side there is fierce international competition of European industries (manufacturers, equipment, air lines, airports, …) with industries form outside elsewhere. Therefore, in order to keep European technological leadership, Europe has to strengthen its own research and innovation capacities.
In support of their own research and innovation activities, European industries can be supported by dedicated international collaboration with the following aims:

- Access to technology
- Standardization of EU concepts
- Supporting European Policies (e.g. Transport)

With respect to support to industry international collaboration may also support

- Access to (foreign) markets
- Access to low cost supply chain

Because of the above mentioned international competition and the danger that know how developed in Horizon 2020 projects will support the competitiveness of competitors to Europe, EREA would like to see only a controlled openness of research topics to international collaboration.

On the basis of an in depth country analysis (e.g. on Funding, Partners, Risk, Background IP & IP ownership, Rights of use, research topics) specific calls for international cooperation with dedicated countries on selected research topics should be defined. Because of EREA members' long lasting experience in international collaboration EREA and its members are available to support the analysis and the selection of research topics for international collaboration.

CIRA	Centro Italiano Ricerche Aerospaziali	**ONERA**	Office National d'Études et de Recherches Aérospatiales
DLR	Deutsches Zentrum für Luft- und Raumfahrt	**NLR**	Nationaal Lucht- en Ruimtevaartlaboratorium
FOI	Totalförsvarets FOrskiningsInstitut	**VZLU**	Výzkumný a Zkušební Letecký Ústav, a.s.
INCAS	National Institute for Aerospace Research “Elie Carafoli”	**ILOT**	Institute of Aviation
INTA	Instituto Nacional de Técnica Aeroespacial		