



EREA position on Aviation Research beyond H2020

Summary of 4 pages - April 2018

Executive Summary and Key Messages

EREA, the *Association of European Research Establishments in Aeronautics*, is a strong supporter of European research, which has proven its efficiency since the first dedicated European Framework Programmes (FPs) 30 years ago. EREA has been widely involved in the European FPs since FP3 in aviation, and in the security field of activities since the creation of this programme in FP7. EREA is committed to the development of the European Research Area and of a flourishing European innovation eco-system, in particular in the Aviation domain.

This paper reflects the common position of the EREA Research Establishments and their recommendations for an impactful aviation research programme in the next Framework Programme, taking into account the “*LAB-FAB-APP*” report of the High Level Group chaired by Pascal Lamy.

EREA wishes to highlight the following Key Messages:

In order to prepare tomorrow’s technologies and innovations that will address societal and market needs of the 21st century and to allow disruptive science to emerge:

- *It is essential to have a dedicated aviation Research and Innovation (R&I) Programme in FP9, paying particular attention to the following:*
 - *A budget dedicated to aviation in the field of Research and Innovation is crucial. Funding envelope should follow the recommendation of the Lamy report to double the budget of the post-2020 EU research and innovation programme.*
 - *It is of utmost importance that this European aviation programme addresses the entire Research and Innovation chain (all TRLs), in a strong and coordinated manner,*
 - *with a budget - via grants - dedicated to research and innovation in aviation up to TRL 6,*
 - *with financial instruments only for TRL > 6 .*
 - *In FP9 it is crucial to foster collaborative research, which generates true EU added value, with better balance between top-down and bottom-up approaches, hence with an increased budget for the medium and long-term lower-TRL collaborative research.*
- *With regard to the instrument to ensure long-term vision and stability of aviation research in FP9:*
 - *The Future Sky Joint Research Initiative - proposed by EREA - is the best way to ensure implementation of the mid- and long-term research strategy as outlined in Flightpath 2050 and laid down in the ACARE SRIA and to prepare the future of aviation in the next but one generation of the Air Transport System (ATS) in Europe.*
 - *To ensure a strong R&I eco-system FP9 should definitively support also applied research, test infrastructures and education:*
 - *There is an essential need to support, develop and maintain test infrastructures for new products and disruptive solutions.*
 - *Education is crucial to get the workforce best suited for the development of new knowledge and innovation.*
 - *The preferred option for the set-up of aviation research in FP9 is the integration into a future Aviation PPP, based on Article 187 of the TFEU (Joint Undertaking), with specific processes, rules, governance and budgets for bottom-up as well as top-down approaches to be defined. EREA is ready and willing to be closely involved in the preparation of the boundary conditions (rules, set-up...) of the PPP.*
 - *EREA fully supports the mission-oriented approach to address global challenges in order to show as a type of lighthouse project the benefit for European funded research for the citizen. An aviation related mission like “European aviation goes more electric” or “urban air mobility” would complement aviation related actions in one pillar e.g. Clean Sky and SESAR.*

Overall structure and Budget of FP9

An EU Framework Programme for Research and Innovation should support the **entire Research and Innovation process**, starting with fundamental research (ERC), technology development (small collaborative Research projects), technology verification (medium sized collaborative Research projects) via system demonstration (JTI) before product development.

The three-pillar structure of Horizon 2020 should be maintained and fine-tuned. The proposal by the Lamy HLG to focus more on the complementarity of the pillars and a **healthy balance between bottom-up and top-down calls** is fully supported by EREA. **Appropriate governance structures** should ensure the seamless flow of knowledge through the innovation chain across the pillars, thanks to good connections between DGs at European Commission level.

As advocated by the Lamy HLG, innovation should be promoted throughout FP9. However, one should realize that sectors have different innovation cycles. In aviation, the cycle is substantially longer than in other sectors.

EREA fully supports the recommendation of the HLG to **double the budget** of the post-2020 EU civil Research and Innovation programme. EREA strongly believes that reaching the target of **3% of GDP investment in R&I** is especially important in a sector that faces fierce global competition. This includes a strong commitment from the private sector and harmonisation of national investments.

In order for Europe to keep its competitive advantage as well as for the discovery and realisation of new ground-breaking technologies, EU funding is mandatory. For supporting and keeping one of the most flourishing EU industries and because of the long cycles characterizing research in aviation, the investment in Research and Innovation is crucial and requires the necessary support from public funding through **Grants** up to TRL 6 (dashed line on Figure 1). To ensure a proper flow through the innovation chain, a certain degree of continuity is required. EREA therefore fully supports multi-annual programming. At the same time, certain flexibility is needed to address emerging issues at hand. However, clear and rigid rules of participation are needed for FP9 to become the trusted, impactful programme it should be. FP9 should earmark a **larger portion of the funding for Collaborative Research** on TRL levels 1 to 4-5, which will keep the invaluable innovation and human capital source for one of Europe's most strategic sectors vibrant and bring in new ideas for the technological base of the European Industry.

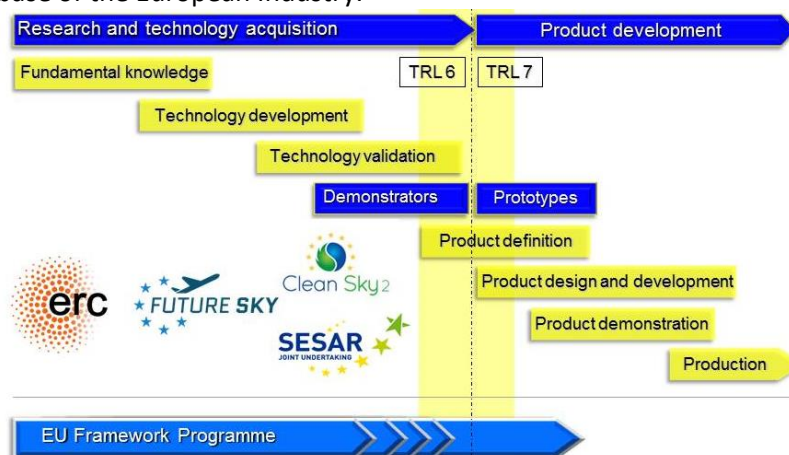


Figure 1: Innovation process needs appropriate funding

Apart from this general set-up, the added value of an EU Framework Programme compared to national efforts is that it funds and fosters cross-border cooperation involving all stakeholders (from universities, REs and industry including SMEs) in various European-wide configurations. Furthermore, the EU Framework Programme enables to implement large scale projects that each individual European nation could not carry out on its own. This EU supported cooperation is the basis for the continuous realisation and maintenance of the *European Research Area* (ERA). In order to avoid silo structures between the research and innovation stakeholders, the successful **collaborative research instruments** need to be maintained and strengthened. This will continue to foster strong cooperation between European universities, research organisations, SMEs and industry, ensuring effective knowledge and technology transfer between stakeholders, which is essential for all sectors including aviation.

In order to prepare tomorrow's technologies and innovations and to allow disruptive science to emerge:

- *EREA fully supports the recommendation of the HLG to double the budget of the post-2020 EU Research and Innovation programme. EREA strongly believes that reaching the target of 3% of GDP investment in R&I is especially important in a sector that faces fierce global competition.*
- *It is of outmost importance that the European aviation programme in FP9 addresses the entire Research and Innovation chain (all TRLs), in a strong and coordinated manner,*
 - *with a budget - via grants - dedicated to the aviation sector in the field of research and innovation up to TRL 6,*
 - *with Financial Instruments only for TRL > 6.*
- *In FP9 it is crucial to foster collaborative research, which is the added value of an EU Framework Programme, with a more balanced situation between top-down and bottom-up approaches, hence with an increased budget for the medium and long-term lower-TRL collaborative research.*

Aviation in FP9

EREA favours an approach where each transport mode has its own programme, particularly above a certain TRL level, even if a cross-cutting approach might be used for some lower TRL research projects as well as for inter-modality. Having a **dedicated programme for aviation research** will better guarantee the flow of technology from low to high TRL than generic programmes. Aeronautics and ATM research should keep a high visibility in FP9.

Up to now aviation research was handled in different programmes. Whereas the bottom-up low to medium TRL research was tackled in the regular collaborative research programme, the mainstream of Clean Sky activity was to integrate technologies into high maturity, full-scale and representative demonstrators. The needed research activities to implement the Single European Sky was handled by SESAR combining exploratory research, industrial research and demonstration with different processes within the SESAR Joint Undertaking.

For the future Framework Programme, considering the fact that lower TRLs research cannot be handled like higher TRLs, EREA recommends the following option for the **future of collaborative research**:

- **Integration of future aviation collaborative research into a future Public-Private Partnership (PPP) using an open neutral process guided by the EC with rules, governance and budgets for bottom-up and top-down approaches to be defined.**
 - Within the Work Programme of an Aviation PPP (Figure 2) there should be room for:
 - A programme aimed at large (flying) demonstrators,
 - One aimed at applied research projects (integrated projects not limited to demonstrators) (including EREA Future Sky projects),
 - And one programme on upstream research (including EREA Future Sky contributions).
 - This option would bring together the full Aviation Research scope into a PPP umbrella (agency, JU...), from the upstream research up to demonstrators, for a more consistent, seamless and flexible technology roadmap to implement the ACARE SRIA action lines.
 - Compared to the current Clean Sky 2 JTI and in order to take into account the bottom-up approach in the full aeronautics research scope, **an adapted and specific governance** should be implemented in the future aviation PPP concept, **with an industry-led approach on the one hand and a bottom-up research-led one on the other hand**. Furthermore, the Aviation PPP could be based on open calls for proposals for the whole Work Programme to increase the openness of the aviation PPP while keeping industry fully involved.
- In addition EREA fully supports the **mission-oriented approach to address global challenges** as outlined in the Lamy report, in order to show as a type of lighthouse project the benefit for European funded research for the citizen.
 - EREA strongly supports the notion of **“moon shots” missions**, as an effective driver for disruptive ideas. In the aerospace sector it is important to invest in incremental improvements of current technology, but we should not be afraid to dream big. Disruptive innovations in aerospace have had huge spill-over effects in the past; Europe should continue on this path.

- Missions could also raise the interest and ambitions of young researchers to work on challenging and new topics.

Clearly defined missions help focus resources where they yield the highest return, and results that are more recognizable to the public. Independently of these missions FP9 should also include other types of funding for further specific topics to mature, where a funding at EU level is also of clear European added value.

From an EREA point of view an aviation related mission like “European aviation goes more electric” or “urban air mobility” could complement aviation related actions in one pillar e.g. Clean Sky and SESAR.

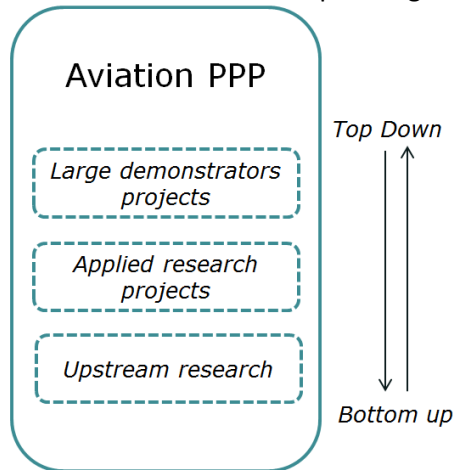


Figure 2: All aviation Collaborative Research under an aviation PPP

With regard to the instrument to ensure long-term vision and stability of Aviation research in FP9:

- EREA fully supports the mission-oriented approach to address global challenges in order to show as a type of lighthouse project the benefit for European funded research for the citizen. An aviation related mission like electric aircraft or urban air mobility could complement aviation related actions.
- The preferred option for the set-up of aviation research in FP9 is the integration into a future Aviation Public-Private Partnership (PPP), based on Article 187 (Joint Undertaking) of the TFEU¹, with specific processes, rules, governance and budgets for bottom-up and top-down approaches to be defined. EREA is ready and willing to be closely involved in the preparation of the boundary conditions (rules, set-up...) of the PPP.
- EREA recommends the next R&I framework programme provides a broad portfolio of bottom-up calls throughout FP9, in order to reach out all ideas and relevant stakeholders in the research community.
- In order to maximise effectiveness and synergies, EC Directorates should coordinate the overall work programmes of the different pillars and ensure cross monitoring of ERC, EIC, and global challenges/mission activities.

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¹ TFEU: Treaty on the Functioning of the European Union