Association of
European Research Establishments in Aeronautics

EREA DEFENCE RESEARCH GROUP (DRG)

COMMON LANGUAGE PAPER 2025

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1 Executive Summary

The Defence Research Group (DRG) is a working group of EREA, the Association of European Research Establishments in Aeronautics. Its primary mission is to contribute to a European collaborative research in specific defence R&TD areas by stimulating the development of joint research projects and establishing related roadmaps supported by concrete project ideas. In addition, the DRG aims to facilitate the networking of aeronautical research capabilities across Europe and to increase the visibility of dual-use technologies developed by research organisations to policy makers, public authorities, and industry.

The goal of the present Common Language paper is to detail the EREA's mission and efforts done in the frame of DRG to promote collaborative research and development activities in the defence sector through transnational cooperation. The EREA DRG plays a central role in these initiatives, focusing on strategic and operative lines of action to enhance European innovation and cooperation. These efforts aim to leverage the collective expertise and resources of EREA members to tackle the evolving security challenges and create a more competitive and integrated European defence technological landscape, including the development of disruptive technologies.

2 Introduction

EREA, the Association of European Research Establishments in Aeronautics, promotes a structured dialogue with the European Commission. It engages with the Directorate-General for Research and Innovation (DG RTD) for civil aviation affairs, and it is committed to closer cooperation with the Directorate-General for Defence Industry and Space (DG DEFIS) on defence matters within the aviation perimeter in the near future.

EREA pays particular attention to representing the joint interests of its members in the field of aeronautics. Through its working groups, such as the Aviation Research Group (ARG, since 1989), the Technology and Research Infrastructures Group (TRIG, since 2018), and the Defence Research Group (DRG, since 2019), EREA facilitates the networking of aeronautical research capabilities across Europe and enhances their joint visibility.

In January 2024, as part of its European Economic Security Package, the European Commission adopted the White Paper on options for enhancing support for research and development involving technologies with dual use potential. The Commission launched a wide public consultation with civil society, industry, academia and public authorities to enable a comprehensive dialogue with all parties on the next steps of the future EU funding programmes. The options were: 1) Going further based on the current set-up, 2) to remove the exclusive focus on civil applications in the Framework Programme and 3) to develop a new instrument for dual use technology development.

In a White Paper issued in April 2024, EREA outlined its support for Option 1, “Going further based on the current set-up”. This option maintains a clear funding scheme for both civilian and defence-related research, building upon existing mechanisms characterized by an exclusive focus on either civil (through Horizon Europe) or defence (through the European Defence Programme) applications.

EREA emphasizes the importance of increased synergies and cross-fertilisation between civil and defence sectors. EREA calls for enhanced synergies between the European Defence Fund (EDF) and the Framework Program 10 (FP10), while stressing the importance of maintaining separate programmes (dedicated to civil and defence) and, for defence, to maintain a balanced budget between research and development phases within the programme that will succeed the EDF.

The development of a new instrument for dual use technology is not recommended, as it is not clear what benefits this would bring over better exploiting synergies. Furthermore, it would be an additional instrument, in an already complex funding landscape, that would likely compete with FP10.

It is suggested to focus more on technologies that, despite having a “civil” application target in the early stages, thus being eligible for funding in FP10, can later develop dual use implications that could be financed through EDF. This may be achieved by fostering collaboration between different

sectors and leveraging existing expert committees and advisory groups that already cooperate in civil and defence R&TD at European level. These groups can help monitoring and identifying relevant technologies that can be further developed across both civil and defence domains. This approach can be implemented without introducing additional complexity or duplicating the planning of R&TD activities into the next multiannual financial framework, thus maintaining the efficiency of well-established mechanisms inspired by the governance models of Horizon Europe and EDF.

The Common Language Paper provides an initial list of areas with potential dual-use implications that are the subject of R&TD activities by EREA members. It also outlines the action lines of the EREA Defence Research Group (DRG), which is dedicated to monitoring and implementing EREA initiatives in defence R&TD.

For the purpose of this Common Language Paper, the term “dual-use” refers to technologies[1] that have the potential to be used for both civil and military purposes in the context of R&TD.

[1] Hardware, such as sensors, machines, vehicles, propulsion systems, PTN/control & navigation modules, and software, including simulation, models, methods

2.1 Present state of affairs

The European Commission is called to foster innovation and achieve European non-dependence on critical technologies. This is part of a comprehensive strategy to enhance Europe's technological sovereignty, to protect European assets, and ensure the continent can access and develop essential technologies independently.

The whole aviation ecosystem must be prepared to maintain its worldwide leadership, especially considering the global competition with US and China, strongly supported by large governmental funding schemes. The strategy includes significant investments in R&TD through renewed European programmes aiming at boosting industrial competitiveness, strategic autonomy, and technological innovation enabling the transition towards a sustainable and digital future.

The European Defence Fund (EDF) aims to enhance the EU's defence capabilities by supporting also collaborative research and development projects, while the EU's Horizon Europe programme supports civil research and innovation. While this separation ensures clear objectives and efficient implementation, it can also lead to missed opportunities for cross-fertilisation and technology transfer. To bridge this gap, there is a growing emphasis on promoting synergies between civil and defence research activities.

As regards civil aviation and given their nature, **European Research and Technology Organizations (RTOs) grouped within EREA are significant contributors to the EU Framework Programmes** and remain key partners in the Horizon Europe partnerships to realize advanced research also for a more sustainable future of European aviation.

As far as defence is concerned, given their role as a bridge between upstream research and applications, and thanks to the key research and technology infrastructures they own and operate, the RTOs also play a pivotal role in addressing current and future defence and security challenges by fostering pipelines from basic research (low TRL) to high TRL technologies. As a testament to this effort, the European Defence Fund (EDF) has seen a remarkable 25% increase in the number of proposals submitted in response to its 2024 Call for Proposals, marking a record since the Fund's inception in 2021. This high level of participation underscores the EDF's success in attracting interest from a diverse range of stakeholders, including RTOs and Small and Medium-sized Enterprises (SMEs), with a 28% increase in participation compared to 2023.

The European collaborative research has historically led to major technology breakthroughs and achievements for aviation in Europe. This collaborative approach not only enhances the quality of research outcomes but also ensures that the European aviation sector remains at the forefront of global technological advancements. This success is achieved also by leveraging the combined expertise, assets, and capabilities of EREA members.
Building on the already proven technical and strategic cooperation in the civil domain-oriented ecosystem, EREA can thus contribute to the overall development of strategic orientations and policies in the field of defence and security, while respecting the national boundary conditions in relation to these subjects.

3 The EREA Defence Research Group (DRG)

The **EREA Defence Research Group (DRG)** was established in 2019 with the aim of fostering closer European cooperation between RTOs in the field of defence. It promotes a European collaborative approach on specific defence R&T areas and can help to identify potential synergies between civil and defence R&TD by supporting topic-specific exchanges involving both research communities.

The **activities** of the EREA DRG include:

- **Ensuring EREA's connection to current developments within the aviation perimeter of the European defence landscape** (such as, but not limited to, the EDF).
- **Identifying R&I gaps and needs** for the short, medium and long term, by considering national and international R&I priorities.
- **Identifying Dual-Use Technologies**: Identify/spot the current landscape of technologies with dual-use potential developed with/by EREA members in the aviation domain. This involves sharing examples, technological achievements and lessons learned, focusing, for instance, on critical and emerging technologies.
- **Bridging R&TD Gaps between Civil and Defence Sectors**: Assess the state-of-the-art (SoA) and develop recommendations to bridge the gap between exclusively civil and exclusively defence R&TD streams.
- **Promoting Collaborative Research:** Encourage collaborative research on defence technologies by prioritizing breakthrough innovations through joint research approaches, infrastructures and demonstration platforms.
- Stressing the importance of **maintaining separate programmes for civil and defence** in the next MFF (FP10 and EDF-2) and, for defence, stressing the importance of maintaining a **balanced budget between research and development phases** within the programme that will succeed to the EDF programme.
- **Developing Guidelines and Managing Risks:** Participate in the definition of guidelines for research involving dual-use items and build strategies to successfully explore and mature them by enhancing research security and managing risks.
- **Implementing Research Initiatives**: Launch pilot projects involving technologies with dual-use potential as case studies to drive spin-in/spin-out initiatives under specific research and development programme.
- **Exploring Cost-Benefit Analysis of New Research and Technology Infrastructures**: Aid in the development of research and technology infrastructures (both physical and digital).
- **Engaging with Stakeholders**: Engage with stakeholders to foster collaboration, share insights, organize consultations, and address top-level challenges through dedicated topic-specific exchanges.

“Dual-use by design” is acknowledged to be very rare and time-consuming, as it often impacts the market uptake of the final product by the civil or defence sector, given that these sectors typically have quite different requirements and operational environments. Given that end-user needs vary based on operational requirements, it is essential to consider these differences in the planning and execution of such projects. This distinction is intended to ensure that projects are optimized for defence applications and contribute directly to strategic military applications, with a view to achieving full interoperability between civil and EU military systems.

3.1 Purpose of the EREA DRG in EU’s strategic autonomy in defence

The DRG member organisations are actively engaged in a diverse array of fields and technologies. These fields include, but are not limited to, drones, hypersonic systems, software development, novel materials and manufacturing, artificial intelligence (AI), energy and propulsion, quantum technologies and autonomous vehicles.

Among the future activities proposed for the EREA DRG, one could be the analysis of future regulations governing dual-use technologies within the European Union. This would ease the technological progress while adhering to regulatory standards.

Some key aspects the EREA DRG can address to contribute to the EU’s strategic autonomy in defence are listed below:

Collaboration and Partnerships: The EREA DRG promotes collaboration among its member organizations to facilitate knowledge sharing, resource pooling, and joint efforts in addressing defence and security challenges, while respecting the boundary conditions that exist, such as the MoD mandate.

Strategic Autonomy: The EREA DRG’s efforts contribute to the EU’s strategic autonomy by gathering tangible information about EU defence R&TD gaps, supply chains and dependence on external technologies, while respecting the boundary conditions that exist, such as the MoD mandate. This helps to strengthen the EU’s defence capabilities and achieve greater self-resilience.

Regulatory Compliance: The EREA DRG may actively engage with EU regulatory bodies to analyse the compliance of dual-use technologies with EU regulations.

Sharing information on Funding: The EREA DRG can share information about EU grants (EDF, EDA) when authorized to support ongoing research and development in defence and dual-use technologies transnationally.

Policy Influence: As far as possible and in compliance with the boundary conditions that exist, such as the MoD mandate, the EREA DRG is ready to take part in discussions with policymakers and stakeholders to help decision-makers to identify technologies to be developed in line with the

EU’s strategic objectives and to orientate the development of EU policies related to military or dual-use technologies.

In summary, by addressing these key aspects, the EREA DRG will be able to play a key role in promoting collaboration among EREA RTOs, thereby facilitating the strengthening of EU’s strategic autonomy in defence.

3.2 EREA collaborative research for Defence

The EREA members operate **a rich landscape of research and technology infrastructures in Europe**, including wind tunnels, which are crucial for developing and testing the aerodynamic performance of military aircraft. These facilities are essential for developing and testing critical technologies, including those with dual-use applications in both civil and military sectors. They enable researchers to gather valuable data for enhanced models' predictions and digital twins' validation.

Some EREA members have made significant contributions to the military sector over the years. Some areas of research carried out by EREA members that may have dual-use implications, meaning they can be used for both civilian and military purposes, are detailed below:

Drones and Unmanned Aerial Systems (UAS): Design, development and testing of UAV/UAS systems including advanced sensing technologies and ground support infrastructures. This includes also Vertical Take-Off and Landing (VTOL) systems and related autonomous flight control technologies, advanced air traffic management (ATM) systems, collision avoidance systems, and AI-driven mission planning.

Smart and High-Temperature Materials: Research in advanced lightweight metals and composites, smart structures, and high-temperature materials/metamaterials that can improve manufacturing, performance, optimizing maintenance and durability of military aircraft. This includes reduced radar visibility, enhanced manoeuvrability for superior combat performance, and optimal efficiency.

Simulation technologies: Exploitation of advanced computing and simulation technologies for defence in Europe, with applications ranging from digital twinning for military purposes to AI-based rapid prototyping of stealth drones.

Virtual and Augmented Reality: Development of complex immersive digital environment to simulate various combat scenarios, plan strategies and enhance decision-making processes. These technologies provide realistic training scenarios to train military professionals under realistic operations combined with augmented reality for enhanced situational awareness.

Artificial Intelligence (AI) and Big Data for Aviation: Research in AI and big data analytics to support assisted decision-making processes based on advanced techniques, by providing real-time insights and predictive models. This includes analysing data from sensors, satellites, and other sources to gain situational awareness, precision, and effectiveness of military operations.

These topics underline the role of EREA members as key partners in advancing military technologies and supporting the European Union's defence capabilities. In this context, and given the role of Research Establishments in the research and innovation chain, EREA can help to unlocking technology transfer, particularly in areas such as unmanned aerial systems, avionics, and sensor systems.

4 European Defence Fund: Multiannual perspective

EREA welcomes the momentum gained by the European Defence Fund (EDF) throughout the multiannual financial framework (2021-2027), which has incentivized a defence research component and cooperation between EU Member States. Such an ambitious European programme relies on robust collaboration between industrial and institutional stakeholders and it is structured around a well-defined governing body, with clear reporting and checking mechanisms in place.

The EDF brings positive progress by promoting defence cooperation in the EU. The EREA RTOs have been quite successful in winning calls for proposals under the EDF, participating in numerous collaborative defence research and development projects aiming at creating cutting-edge and interoperable defence technologies. These projects cover a wide range of areas, including air combat, cyber defence, simulation, and disruptive technologies for aviation.

In the successor to the EDF programme, EREA strongly suggests maintaining **a fair balance between the budget allocated for Research and the budget allocated for Technology Development**. Both phases, corresponding to different scales of TRL, are necessary to ensure a coherent evolution of the defence capabilities.

It is recommended that a greater focus be given to **non-thematic research actions** targeting **disruptive technologies for defence**. This part of the programme promotes EU collaborative research to develop radically new future technologies. This topic encourages the driving role of RTOs, that are often at the origin of innovative solutions, carrying out cutting-edge research with advanced technological expertise.

5 Closing Remarks

EREA's mission is to promote and represent the joint interests of its members and to intensify the European cooperation in the field of aviation.

The EREA DRG, created in 2019 before the launch of EDF, is instrumental in fostering collaboration and synergy within the EREA members in the defence sector, by potentially ensuring optimal utilisation of resources for technological excellence. By promoting cooperation among EU RTOs, the DRG facilitates the sharing of aeronautical research capabilities across Europe and can help to increase the visibility of research achievements and technologies for defence developed by research organisations, including those with dual-use implications, to policy makers, public authorities, and industry.

This Common Language paper outlines the strategic and operative actions of the EREA DRG to foster collaborative research and development in the defence sector. This working group is actively engaged in defence R&TD at the European level, leveraging the collective expertise and resources of EREA members. The DRG is open to discussion on the preparation of the next MFF and EU programmes of interest to EREA (FP10, EDF) with the aim of funding research and development and strengthening the EU autonomy and competitiveness.

About EREA

The Association of European Research Establishments in Aeronautics (EREA) is a non-profit organisation whose members are Europe's most outstanding research centres in the field of aeronautics and air transport. These Research Establishments are key players in the innovation chain, contributing to the state-of-the-art science for aviation applications, being closely linked to their national governments and industries, and at the same time having a profound knowledge of the aviation industry and its needs. EREA unites 15 European research establishments in aviation, committed to developing the European Research Area and a flourishing European research and innovation ecosystem in aviation.

EREA is registered in the EU Transparency-Register under No. 010397411668-54

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