

# Position Paper on the Critical Role of Universities in Achieving Europe's Aerospace Ambitions



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## Executive summary

Europe's ambition to achieve a sustainable and world leading aviation sector by mid-century requires a profound transformation of the aerospace sector. This transformation depends on a strong innovation ecosystem linking research, industry, regulators, and society, within which universities play a central role.

Universities educate and continuously upskill the engineers, scientists, and regulators who will design, certify, and operate next-generation aircraft and air traffic management systems. They also generate fundamental research that enables technological breakthroughs in areas such as zero-emission propulsion, advanced materials, digitalized aviation systems, among others. In addition, universities provide independent validation, multidisciplinary systems thinking, and regional innovation leadership that strengthens Europe's aerospace ecosystem.

The European Aerospace Science Network (EASN) calls on policymakers and industry leaders to ensure sustained and structured university participation in European aerospace partnerships, research infrastructures, advanced training programs, and innovation initiatives to secure Europe's long-term leadership in sustainable and competitive aviation while strengthening Europe's sovereignty and strategic autonomy.

## The role of academia in the aerospace innovation ecosystem

Europe's expressed ambition to achieve climate-neutral, competitive, and globally leading aviation by mid-century requires a profound transformation of the aerospace sector. Meeting these ambitious goals demands an innovation ecosystem that connects fundamental research, industrial development, regulatory evolution, and societal acceptance. Within this ecosystem, universities play an indispensable role. Their contributions in education, research, validation, and public engagement form the foundation upon which Europe's sustainable and competitive aerospace future will be built.

Beyond environmental sustainability, Europe's aerospace ambitions are also closely linked to the broader objectives of technological sovereignty and strategic autonomy. Aerospace capabilities are essential for ensuring Europe's ability to design, produce, and operate critical technologies independently, while remaining globally competitive. Universities play a vital role in this dimension by nurturing highly specialised expertise, maintaining advanced research infrastructures, and sustaining long-term knowledge development in strategic technological domains. Through their research and educational activities, academic institutions help ensure that Europe retains the scientific and technological foundations necessary to support its industrial base, safeguard critical capabilities, and reinforce its strategic autonomy in aviation and aerospace.

Universities are first and foremost developers of knowledgeable and skilled professionals. They educate, train, and continuously upskill the engineers, scientists, and regulators who will design, certify, and operate tomorrow's aircraft and air traffic management (ATM) systems. As the aerospace sector transitions toward zero-emission in aircraft production, operation, and MRO, without however abandoning its competitiveness, the demand for highly skilled graduates will grow dramatically. Through master's and doctoral education, lifelong learning, and short professional programmes, universities ensure that Europe maintains its capacity to innovate and adapt in a rapidly changing technological landscape.

Equally vital is the knowledge base that universities generate. While industry primarily focuses on near-term and de-risked development, academia advances fundamental and exploratory research—the kind that enables step-changes rather than incremental improvements. Work in areas such as advanced materials, propulsion physics, hydrogen safety, systems modelling, and life-cycle analysis, to name only some, lays the scientific groundwork for future demonstrators and industrial applications. To meet the challenge of achieving ecologically sustainable and competitive European aviation, capable of retaining its position as global leader, it is mandatory to sustain research across the entire innovation chain, i.e., from upstream discovery to large-scale validation. In this chain, universities are the principal and indispensable source of upstream knowledge. University researchers possess state of the art knowledge and the means to design, test, and verify the technologies expected to mature to higher TRLs.

Across Europe, universities operate wind tunnels, simulation laboratories, test rigs, and digital twin platforms that provide unbiased data and analysis. This independent scientific validation strengthens the credibility of emerging technologies with regulators and accelerates certification processes—an essential step if Europe is to meet its Destination 2050 targets on schedule. Academic involvement in safety and risk assessment ensures that new solutions are not only innovative but also robust and trustworthy.

The challenges linked to the high-level objective of an ecologically sustainable and competitive European aviation require multidisciplinary systems thinking—the integration of engineering, chemistry, data science, economics, environmental science, and human factors. Universities are uniquely structured to enable this kind of cross-domain collaboration. They can combine technical and socio-economic perspectives, enabling systems-level analysis and holistic solutions that industrial consortia alone may not prioritize. This ability to operate across the interfaces between disciplines is especially critical at Technology Readiness Levels (TRL) 4–6, where technologies must be integrated, qualified, and prepared for industrialization.

At the same time, universities act as regional innovation engines. They connect major aerospace manufacturers with SMEs, start-ups, and local suppliers, helping to diffuse knowledge and build resilient, competitive supply chains across Europe. This role supports not only technological progress but also the European Union's broader goals of regional cohesion, economic sovereignty, and sustainable industrial transformation. The design of European research frameworks must include academia as integral participants in the innovation ecosystem.

Another essential contribution of universities lies in education for deployment and societal readiness. As the sector moves from research to demonstration and deployment phases between 2028 and 2035, rapid upskilling will be required across engineering, certification, maintenance, and operational domains. Universities can respond quickly by offering targeted MSc, PhD, and continuing-education modules aligned with the needs of industry and regulatory authorities. Beyond technical skills, academia plays a key role in promoting societal understanding and acceptance of new aviation technologies, ensuring that sustainability transitions are both technically sound and publicly supported.

Finally, universities also serve as trusted convenors in policy, standards, and regulation. Their neutral and evidence-based perspective allows them to contribute meaningfully to public consultations, certification frameworks, and the development of new standards. This independent expertise bridges the gap between industrial innovation and societal expectations, helping to align safety, sustainability, and competitiveness objectives. In parallel, universities continue to inspire and engage the next generation of students and professionals, ensuring the long-term vitality of Europe's aerospace research community.

Europe's path toward clean, efficient, and socially accepted aviation will depend on maintaining a strong, visible, and well-resourced academic sector. Universities do not simply complement industry; they enable it by providing the people, knowledge, infrastructure, and credibility upon which innovation depends. The European Aerospace Science Network (EASN) therefore calls for sustained and reinforced university engagement in all major European aerospace partnerships and programmes.

### **Ensuring the Role of Universities in Europe's Aerospace Partnerships**

To deliver on Europe's strategic ambitions, the engagement of universities in major aerospace partnerships must be systematically embedded and supported. This requires targeted mechanisms that secure academic participation and strengthen the research–innovation continuum.

Firstly, academic involvement should be mandated and incentivized within European aerospace programmes. Calls should explicitly require collaboration between industry, academia, and SMEs, with a defined share of funding directed toward university-led activities, including PhD and postdoctoral research. Evaluation criteria should reward balanced participation and knowledge exchange between these partners.

Secondly, joint university–research establishments–industry testbeds and shared research infrastructures—such as hydrogen laboratories, high-fidelity simulation environments, and wind tunnels—should be promoted and made accessible across national and sectoral boundaries. Such facilities enable efficient use of public investments and ensure that high-quality research data benefits the entire European community.

Thirdly, the EU should establish multidisciplinary Centers of Excellence aligned with aircraft technologies and ATM where technologies can be combined, integrated and validated in system level applications. These centres would ensure continuity of knowledge and expertise by

synthesizing insights from individual projects, allowing new knowledge to be accumulated and effectively leveraged across programmes.

Additionally, Europe must scale co-funded doctoral and postdoctoral programmes, as well as flexible micro-credential initiatives, to meet the accelerated upskilling needs to transform aerospace business. Targeted educational funding would allow universities to train professionals capable of implementing emerging technologies during the critical 2028–2035 deployment phase. Such mechanisms rely on the active role of academia throughout the aerospace research and innovation actions.

Universities should be empowered to translate research into innovation through technology transfer schemes, spin-out support, and early-stage funding, turning academic inventions into viable SMEs and suppliers that strengthen Europe’s aerospace supply chain. Funding should also support standardization and pre-competitive studies, areas where universities contribute essential, unbiased evidence for regulation and certification.

Universities can also contribute significantly to European initiatives addressing security and defence dimensions of aerospace. Many technologies developed within the aerospace sector—including advanced materials, autonomous systems, digital engineering tools, propulsion technologies, and secure communications—have dual-use potential. Greater coordination between civil research frameworks and defence-oriented initiatives, such as those supported by the European Defence Agency and the European Defence Fund, would enable Europe to maximise the impact of public investment in aerospace research while reinforcing its technological base. Universities are well positioned to support this dual-use innovation ecosystem by providing independent research capacity, interdisciplinary expertise, and highly skilled graduates capable of working across both civil and defence domains.

By embedding these mechanisms within European programmes, policymakers can ensure that universities remain fully integrated and effective partners in the drive toward clean, connected, and competitive aviation. The European Aerospace Science Network (EASN) therefore calls for strengthened collaboration between academia, industry, and public authorities to ensure that Europe not only meets its ambitious targets in sustainable aviation but also secures its leadership in the sustainable aerospace sector for generations to come.