A European industrial strategy for civil aeronautics

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Executive Summary

The civil aeronautics industry and aviation sector is a key EU and wider pan-European (ECAC[1]) leader and a public good in all respects: sovereignty, competitiveness, innovation, and resilience. Its unique contributions are vital for bridging the innovation gap, advancing decarbonisation, and through dual-use technologies fortifying defence capabilities.

As one of Europe's true global leaders, the civil aeronautics industry directly employs more than 406000 highly skilled individuals and supports nearly four million across the continent. Generating annual revenues of nearly €130 billion in 2024, it is a powerful engine for productivity, exports (€108,6 billion in 2024), and research.

The aeronautics/aerospace industry's fundamental dual nature — covering both civil and defence activities such as aircraft, helicopters, ATM technologies, satellites, and launchers— while respecting their specific characteristics - highlights its stance as a distinct and valuable European asset.

Unique challenges ahead. However, the aeronautics ecosystem is currently navigating a compendium of unprecedented challenges. In a context of intense competition from other global powers, which have historically viewed this industry as highly strategic and are escalating their efforts in the current geopolitical climate, it is tasked with delivering the "4th revolution of aviation" – sustainable aviation. Moreover, at OEM level and throughout its integrated supply chain, it is currently rushing to ramp-up production on both its commercial and defence portfolios.

A European leadership to maintain. Whereas the worldwide growth of aviation presents a tremendous opportunity for industry and employment in Europe, keeping and actively fostering the EU's prominent position in civil aeronautics is critical and by no means assured. This necessitates a proactive, cross-cutting, and ambitious EU aeronautics and aviation industrial strategy, fully harmonised with existing EU defence and space initiatives and policies. This strategy will form the bedrock of a renewed partnership between EU and national institutions and the industry.

To achieve these goals, several key areas require focused efforts:

- **Intensified Innovation for Sustainable Leadership:** Sustaining leadership in aeronautics, digitising production and operations, and achieving the 2050 net-zero carbon emission target in line with the European aviation sector's **Destination 2050 roadmap** will require intensified innovation. The **2025 EU Aviation Research and Innovation Strategy (ARIS)** provide a clear roadmap, focusing on Clean Tech and efficient propulsion, innovative airframe & component configurations, collaborative platforms, non-CO2 emissions/noise reduction, safe operations and cybersecurity, critical/sustainable materials and production, smart automation for safety, and Air Traffic Management. Beyond significantly increased funding, a robust pathway from innovation to implementation and deployment is crucial, particularly through the EU Competitiveness Fund. The proven success of the **Clean Aviation and SESAR (Air Traffic Management) Joint Undertakings** in addressing complementary research fields must be preserved. Delivering on this innovative path will also demand intensified certification efforts, requiring the reinforcement of **EASA**, a powerful executive agency with strong international credibility.

- **Decarbonization: A Call for Unprecedented Investment and Coordination:** The decarbonisation of the aviation sector, in which the EU wants to be a leader, necessitates substantial investments, estimated by the Draghi report at an additional €61 billion per year. This demands an unprecedented level of private and public investment (through the Sustainable

[1] European Civil Aviation Conference composed of 44 European States

Transport Investment Plan, earmarked ETS revenues, and the EU Competitiveness Fund). It also calls for much closer coordination and alignment among EU initiatives and with Member States. A specific focus will be needed on **renewable energy (Sustainable Aviation Fuels, Hydrogen and Electricity)**, aligning with the ReFuelEU mandate: derisking and effectively triggering production projects, increasing ETS allowances, prioritizing aviation in biomass access, and implementing a book and claim mechanism. Alliances like RLCF and AZEA must be reinforced and made more agile. For (liquid) hydrogen, dedicated infrastructure development (electrolysis, liquefaction plants, pipelines, LH2 storage, and refuelling and recharging at airports, etc.) will be essential. The EU should also advocate for aligned worldwide standards. A further contribution is expected on energy management that can be optimized along the manufacturing process by enhanced monitoring through data driven analytics and artificial intelligence.

- **Building a Robust and Resilient High-Tech Industrial Base:** The sector relies on an extensive and deeply integrated network of suppliers across and beyond the EU. To maintain its leadership, the aeronautic supply chain must meet **increasing global demand through ramped-up production and deliveries**. Simultaneously, it needs to proactively integrate new materials and green and digital technologies, requiring modernized, automated, and resource-efficient production methods. In a volatile geopolitical landscape, where international supply chains face significant and prolonged disruptions, **strengthening the European supply chain is paramount**. Given its small volume, the aeronautics sector requires **specific efforts to secure access to critical raw materials** (e.g. titanium and rare earths), components (e.g., semiconductors and permanent magnets), advanced materials, and appropriate chips. **Uncompetitive European energy costs must be addressed, and increased circularity** sought through new materials and processes paving the way for re-use/recycling. Furthermore, the European industrial base and critical infrastructures (including airports and air traffic) are increasingly vulnerable to **hybrid attacks that endanger continuity and represent a major risk** in times of heightened geopolitical tension.

- **Digitalization as a Core Enabler:** Digitalization will be key across the entire value chain, from design to production, supply chain management, aircraft operation, predictive maintenance, and a Digital European Sky. The increasing use of AI in the sector pushes technology to its limits (robustness, reliability, certification, duality), benefiting many other sectors. However, many use cases will require sovereign EU digital solutions (across the value chain, but notably on Cloud and AI).

- **Winning the Air Traffic Management Race:** as discussed at the last ICAO Assembly, **Air Traffic Management**, where the European industry is a world leader, faces two critical worldwide races where Europe cannot afford to stay behind:

    - The race for capacity, to manage the growth from today's peaks of 35,000 flights a day to a projected 50,000 by 2035, while maintaining the highest levels of safety.

    - The race to decarbonize, where modernizing the ATM system is a low-hanging fruit, offering the potential to cut flight emissions as part of the basket of measures defined by ICAO within the framework of the LTAG[2]. Existing and developing technologies (notably through the SESAR JU) are being deployed and must be accelerated.

    - The SESAR masterplan is the common European roadmap which should be supported with further EU funding for SESAR deployment to synchronize and accelerate deployment actions and ensure a closer alignment between different industry stakeholders, the EU and its Member States.

[2] ICAO has adopted in 2022 a long-term global aspirational goal (LTAG) for international aviation of net-zero carbon emissions by 2050.

- **Simplifying the Regulatory Framework:** An ambitious simplification of the regulatory framework at both EU and national levels will be necessary to foster the industry's competitiveness.

- **Addressing the Skills Challenge:** Europe's civil aeronautics sector is grappling with a **mounting skills challenge**, driven by a wave of retirements, evolving technological requirements, and intense competition for talent with other high-tech industries. Despite hiring booms, the industry still faces high vacancy rates in key roles such as engineers, technicians, and digital specialists across Europe. Tackling this challenge requires collective, sustained efforts—leveraging policy frameworks, industry initiatives, and educational partnerships—to ensure the sector remains at the forefront of innovation, sustainability, and global competitiveness.

- **Leveraging Duality for Resilience:** Our industry benefits significantly from its **dual nature**, which leverages commonality with larger-scale civil programs. From a general perspective, **the duality strengthens the sector's resilience**. Its potential implementation at the operational level however requires taking into account that civil and military domains have **different purposes and specificities that must be clearly reflected in the framework of the European Competitiveness Fund (ECF)**.

With whom should the EU institutions partner to implement this strategy?

- EU institutions can rely on the strong support traditionally provided to the sector at national level. However, the nature of current challenges requires coordinating **those national initiatives in support of our industry (particularly true for critical raw materials, critical components or sustainable aviation fuels,** while being complemented by additional efforts which are more effective at the EU scale.

- **Strong cooperation with** other non-EU European Member States through the **European Civil Aviation Conference (ECAC)** considering the pan-European nature of the industry. It is in particular **essential for the EU, European Civil Aviation Conference (ECAC) and its Member States to continue their efforts to ensure that ICAO work is in line with European and European industry needs.**

- **Increased EU economic diplomacy** would fuel exports and competitiveness. Mobilizing **trade and economic security policies** will be essential to ensure a global level playing field.

- **The implementation of this strategy will be essential as the industry is global.** International cooperation and convergence, particularly through **ICAO**, will be critical.

Our vision

Europe and the European civil aeronautics industry will have maintained worldwide leadership in the transformation of global civil aviation towards carbon-neutrality by 2050, and in the shift towards a fully Digital Sky for Air Traffic Management, thanks to the promotion of European technologies and based on the highest efficiency, environment, safety & security standards.

This European leadership will have been safeguarded by a strong and steady joint European effort where the EU institutions, European Agencies (EASA, SESAR-JU, Clean Aviation-JU, Eurocontrol), EU and other non-EU ECAC Member States have worked together as a 'Team Europe' to make this vision a reality.

This effort will have contributed to Europe's strategic autonomy, resilience and sovereignty thanks to the dual nature of civil and defence technologies.

As a consequence, the challenges the industry faces **require (1) an unprecedented level of private and public investment, (2) paired with stronger political support, and (3) much closer coordination and alignment among EU initiatives and with Member States. This needs to be structured through a dedicated aeronautics industrial strategy.**

To deliver this vision, we propose an EU industrial strategy for civil aeronautics based on the following pillars:

1. **Acknowledging aeronautics as a strategic sector for the EU**
2. **Accelerate innovation and double the EU public funding for civil aviation research**
3. **Strengthen the industrial component of civil aeronautics**
4. **Support the modernization and digitalization of Air Traffic Management (ATM)**
5. **Support civil aviation decarbonization**
6. **Simplification and reduction of regulatory burden**
7. **Continue and strengthen international cooperation**
8. **Address the growing skills challenge**
9. **Leverage the EU institutions, European Agencies, EU Member States and other ECAC Member States working as a 'Team Europe' to make this industrial strategy a reality**

Introduction - The European civil aeronautics industry

A global leadership

Europe's civil aeronautics sector consists of a network of major prime contractors (i.e. Airbus, ATR, Dassault Aviation, Frequentis ATM, Indra, Leonardo, Rolls-Royce, SAAB ATM, Safran, and Thales ATM) and a dense network of major equipment manufacturers (i.e. Diehl Aviation, GKN Aerospace, Liebherr Aerospace SAFRAN and THALES), thousands of mid-sized supply chain companies and innovative SMEs, distributed across Europe / with production facilities in all European countries.

European civil aeronautics turnover, as part of the wider European civil aviation eco-system, reached €129,1bn in 2024, enabling €108,6 bn of exports, which makes it an outstandingly precious asset for the EU. Despite the challenges posed by a tight labour market and a shortage of highly skilled workers, sector employment increased by 4.7 % in 2024, reaching a total of 406264 jobs. In addition to direct employment, the economic impact of the civil aeronautics sector in Europe was nearly 4 million people in 2024, including direct, indirect and induced employment.

The **European aeronautics industry** addresses civilian and military markets: its technologies, products and expertise serve both purposes with strong experience of cross-fertilization between both sectors. The civil aeronautics sector - in its entire value chain, from suppliers to aircraft and engine producers, ATM and airport ground system providers - is therefore also **critical to ensure Europe's strategic autonomy** in terms of technologies for mobility and contributes to many advanced technologies with relevant spillovers towards other sectors such as defence. This technology foundation, classified as "high-tech" in a recent analysis of EU Innovation Policy, is based on the reality that civil aviation and its products are among the most complex manufactured and integrated systems, with exceptionally high requirements on safety, efficiency, reliability, operating amongst increasing civil aviation traffic density and harsher weather/climatic/environmental conditions throughout their life cycle.

Europe's civil aeronautics industry represents around **40% of the worldwide civil aeronautics market by value** (source: ASD own research):

- European manufacturers are market leaders and account for approximately **45-50% of global large commercial aircraft deliveries worldwide.**
- Europe's **direct market share in civil engines accounts for 35-40% of the global market** but its **industrial footprint reaches well over 50%** of all new civil engines sold globally.
- The European Air Traffic Management (ATM) Technology industry has a market share of around **60% of global ATM infrastructure sales.**
- In **aerospace equipment and systems** (engines, avionics, landing gears, aerostructures, cabin interiors etc.), Europe has about **35-40% global market share.**
- Europe's civil helicopter industry accounts for approximately **55% of the global market for civil helicopters:** European helicopter manufacturers accounts for approximately **50% of the global civil/parapublic helicopter fleet.**
- Europe's Maintenance, Repair and Overhaul (MRO) industry represents around **20-25% of the global MRO industry.**
- Europe also has a **10-15% market share in civil business jets** with Dassault, Falcon being one of the leading manufacturers globally.
- For regional aircraft, Europe (ATR) holds over **75% of global turboprop deliveries.**
- Europe has also several players in other fields such as **general aviation manufacturers** and emerging **Advanced Air Mobility technologies (including civil drones)**.

The need for an industrial strategy for civil aeronautics:

Thus, Civil Aeronautics is one of the rare sectors – if not the only one – where Europe has achieved a world leadership. This European leadership should not be taken for granted. The crisis of the automotive sector shows that even a European innovative and flourishing industry can easily be put at risk if technological shifts and the accompanying transformation of industrial capacities and infrastructures are not sufficiently anticipated and prepared for them. The EU therefore urgently needs an industrial strategy for civil aeronautics to set the rights conditions to enable our industry to continue leading at global level and to safeguard European jobs, strategic autonomy and competitiveness while addressing the need to reduce environmental impact!

1. Acknowledging aeronautics as a strategic sector for the EU

Aviation and aeronautics are essential to Europe's cohesion – connecting all areas, notably islands and remote regions with mainland Europe. It plays a fundamental societal role, facilitating freedom of movement, fostering cultural exchange, promoting trade, economic opportunities and stability. The aeronautics sector symbolises European technological excellence around the world. While major geopolitical blocs such as the United States, China and even Brazil consider their aerospace industries to be strategic, the EU still struggles to recognise its own aeronautics industry as such.

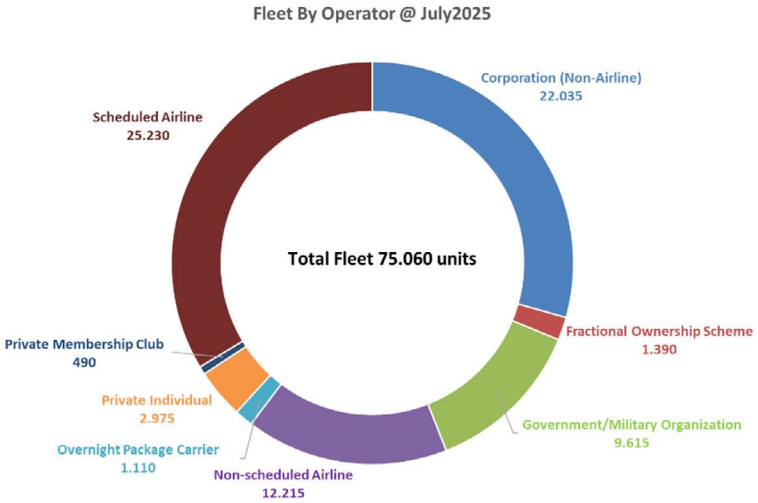
Civil aviation consists of both fixed wing (airlines, business jet operators and general aviation) as well as rotorcraft, ATM and MRO industries. They are all essential sub-sectors of civil aviation which play complementary roles. As highlighted in Mario Draghi's report, *The Future of European Competitiveness*, aviation is a cornerstone of the EU's economic strength. It drives job creation, creating high-quality, skilled jobs across the ecosystem and driving research and innovation, and positions Europe as one of the most connected regions globally. In 2019, air transport supported 14 million jobs and contributed €851 billion to GDP in Europe[3] – equivalent to 1 in every 17 jobs (6% of total employment) and 5% of the continent's GDP. The European industry is a world leader in the design and manufacture of civil aircraft, with exports amounting to €108.6 billion in 2024, positively contributing to the EU trade balance. Continued economic growth is an enabler of Europe's environmental ambitions.

The achievement of 'Net Zero' is a non-negotiable imperative, thus driving a radical transformation of the whole aviation sector while safeguarding its unique economic and social benefits. European aviation industry – which includes airlines, airports, air navigation services providers and civil aeronautics industry – is through the Destination 2050 initiative jointly committed to reach climate neutrality by 2050, in line with EU Green Deal and 2015 Paris Agreement.

Fixed Wing
The civil aviation market is mainly characterized by 5 aircraft segments: **narrowbody, widebody, regional (jet and turboprop) and business aviation**.

The current worldwide fixed wing aircraft fleet consists in around **75,000 units** and European fleet account for 19% (14,000 aircraft).

Source: AviationWeek

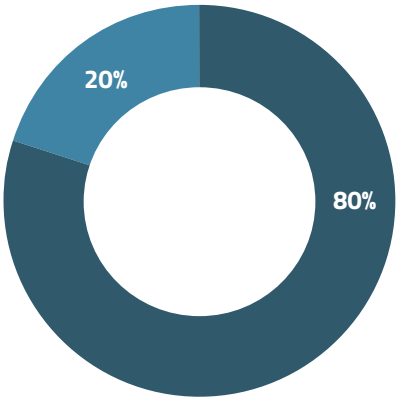


[3] Europe i.e. EU, UK and EFTA.

Fleet in service (as from 2024)

(scheduled airlines only, source: Airbus):

Worldwide (passenger aircraft only):



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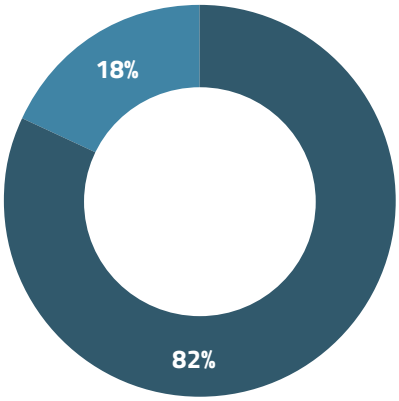
Europe & CIS (passenger aircraft only):



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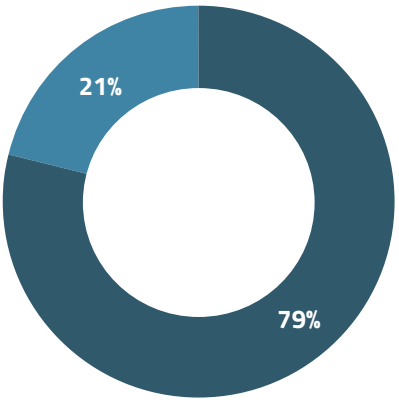
Deliveries (2025-2044)

(scheduled airlines only, source: Airbus):

Worldwide deliveries



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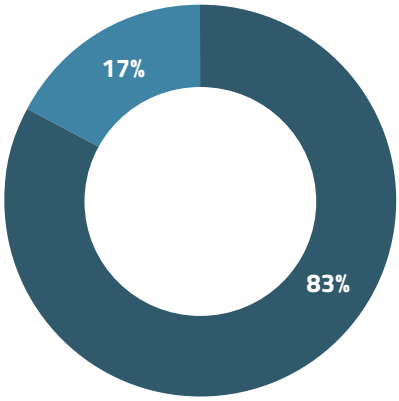
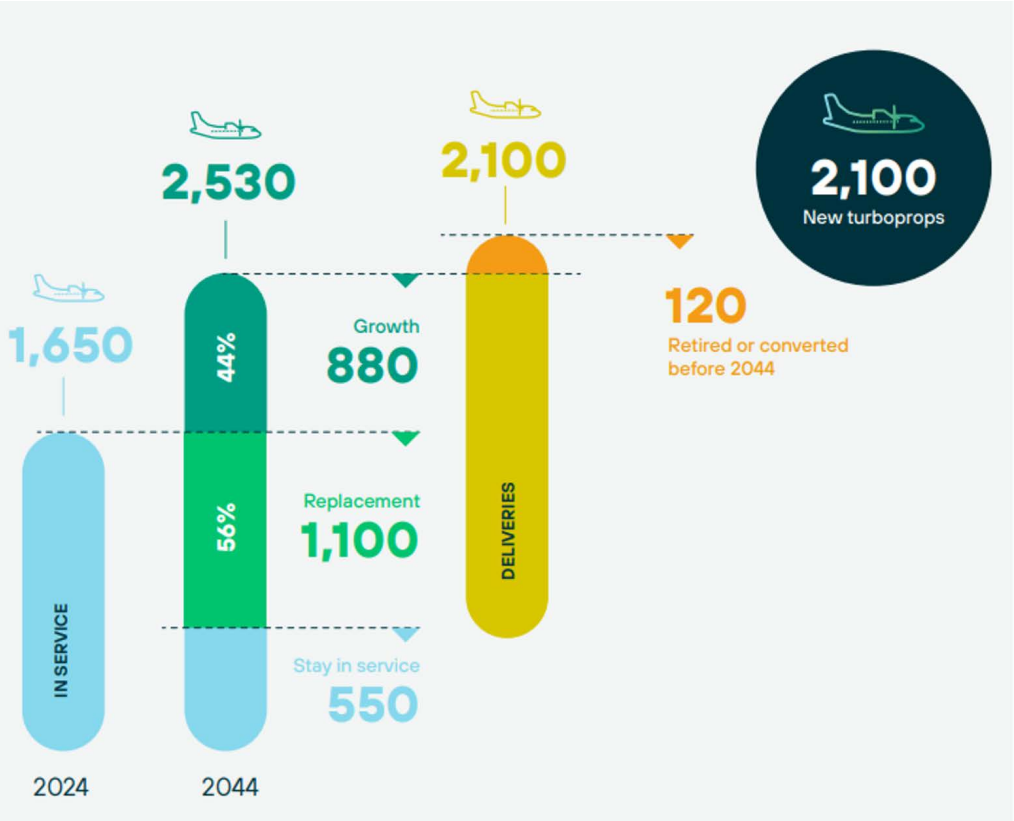
Europe & CIS deliveries



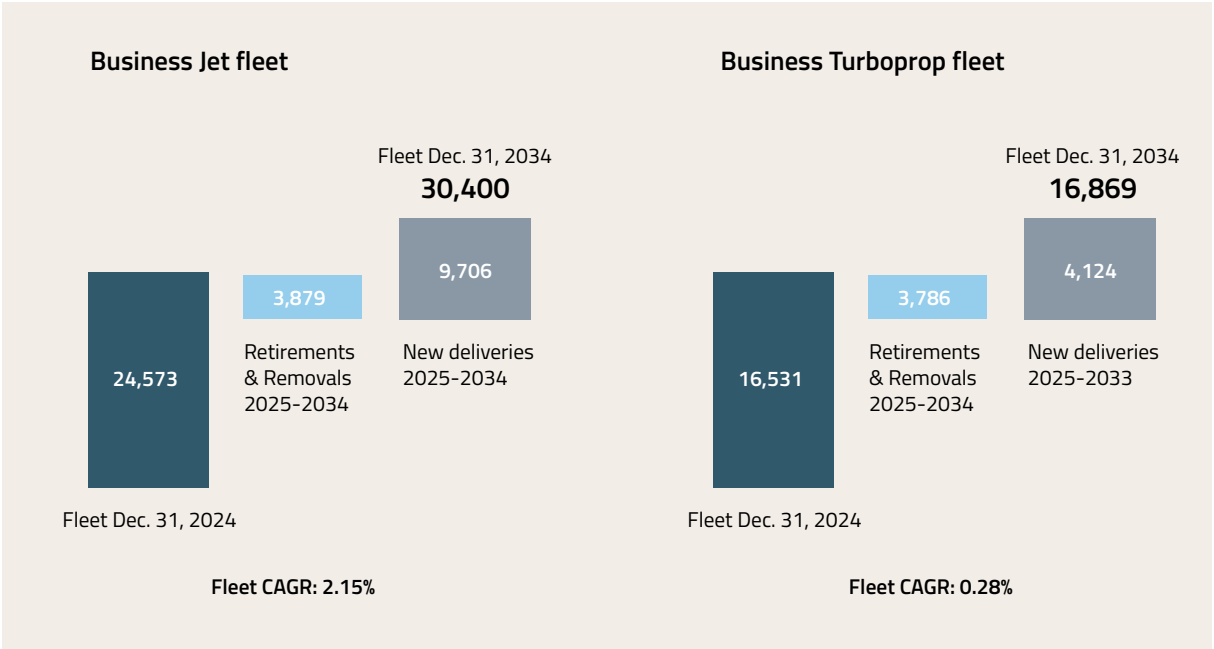
Typ. SA **6.660** Typ. WB **1.410**

Regional turboprop aircraft

(source: ATR)



Business Aviation *(source: JETNET IQ Q2 2025 Report)*



Players and competition: The sector is characterised by a **widespread international presence** and **intense competition** among various companies, operating in both aircraft design and manufacturing and related services. The sector encompasses **both civil and military aviation**, with a strong presence of large global players and a growing importance of companies specialising in advanced technologies, including numerous other smaller companies and innovative startups (high degree of fragmentation; room for consolidation/partnerships).

Capital and technology-intensive activities: The sector is constantly evolving, with a **strong push towards technological innovation**, especially in the fields of materials, propulsion systems, and onboard electronics. Significant investments are required over the programs full-life cycle, from development to end of life. Crucial role of public/government support is needed to boost the sector and its competitiveness. Growing focus on **sustainability** aspects should be addressed.

Rotary Wing

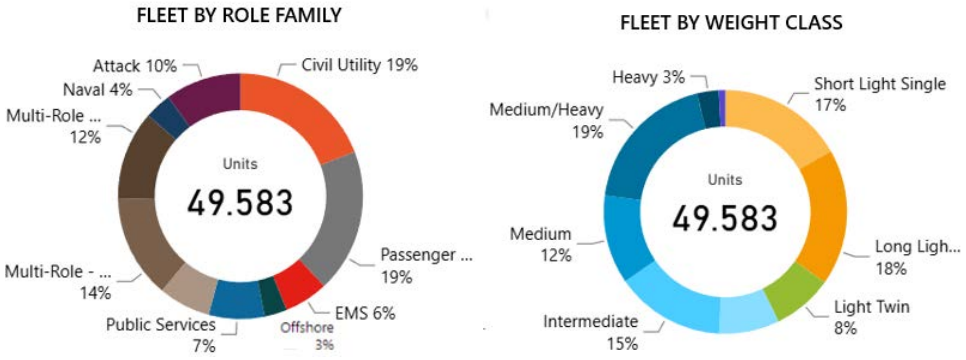
Rotary wing platforms play a key role enabling otherwise impossible missions such as Search & Rescue (SAR), Emergency Medical Services (EMS) and disaster relief, in addition to the more conventional and necessary passenger transportation activities.

In the rotary wing market, through Leonardo and Airbus Helicopters, the EU has an industrial global leadership (with approximately 50% of the global civil/parapublic helicopter fleet and almost 55% of the civil/parapublic new helicopter deliveries in the last 10 years) which must be protected through sustaining technological sovereignty, as well as reinforcing the European supply chain autonomy and competitiveness. In the helicopter domain, dual use as a design philosophy is the established engineering approach, with only a few specific configurations being born exclusively for military use (attack helicopters, super-heavy, maritime/anti-submarine warfare).

The helicopter market is characterized by weight classes, divided into short light single engine, long light single engine, light twin, light intermediate, intermediate, medium, medium-heavy, heavy, which are interrelated to end-user applications (e.g. EMS, SAR, Utility, Law Enforcement/Governmental, Pax Transport, Offshore/Energy).

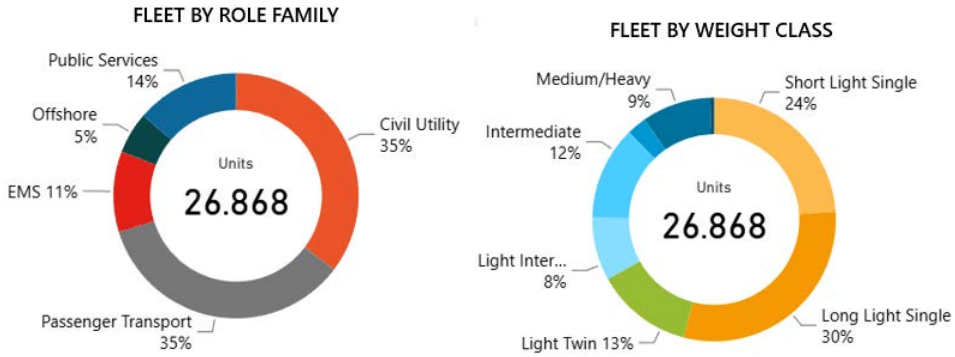
The current worldwide fleet (civil/parapublic & military) consists of around 50,000 units, with a distribution as detailed below.

Global Helicopter Fleet [3]

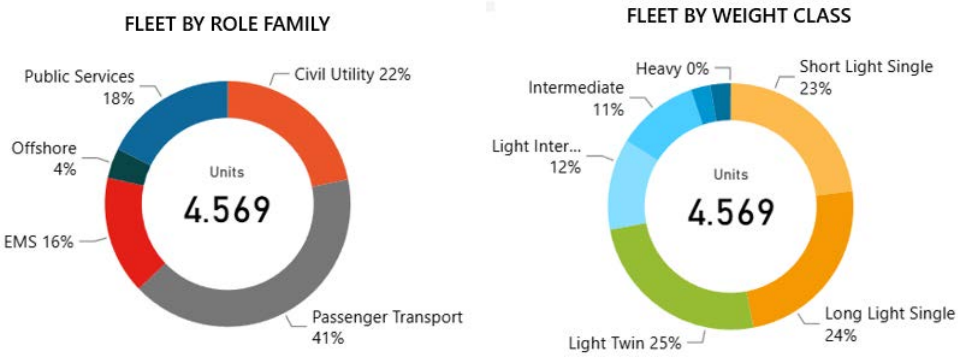


Note: Public Services include SAR and Law Enforcement roles

Global Civil/Parapublic Helicopter Fleet [4]



Europe (i.e. EU, UK and EFTA) Civil/Parapublic Helicopter Fleet [4]



During the course of the next decade, the global aviation fleet, excluding commercial aviation, is forecasted to grow to over 130,000 units (2035+), of which helicopters will represent around 40% of the total.

The civil aeronautics industry

Aviation and aeronautics support essential, reliable transport routes and contributes to Europe's defence capabilities, upholding both sovereignty and economic security. A strong aerospace and defence sector is a foundation for prosperity, enabling the investments needed for decarbonisation. Additionally, space activities play a unique role in sustainability, driving advancements in climate monitoring, resource management, and environmental protection. Maintaining a robust supply chain within Europe further safeguards our sovereignty and economic security.

Aviation is inherently a hard-to-abate sector, with stringent safety standards and technology certification requirements. While the European civil aviation sector is taking responsibility and action to decarbonise the sector, achieving net-zero emissions at pace will require further support from the EU to maintain momentum and contribute to both international aviation-specific and EU climate objectives.

It is time for European decision makers to recognise the strategic importance for Europe to maintain a sustainable civil aviation and world-leading civil aeronautics sector.

The civil aeronautics industry, as a basic component of European aviation, is an invaluable strategic asset for Europe for several reasons:

- It enables Europe's strategic autonomy in global mobility for both citizens and goods.
- It develops and matures many advanced technologies that feed sectors of strategic importance, especially defence.
- As Europe is globally leading the path to earth preservation, the loss of Europe's tecnological and economic leadership in aeronautics will jeopardize the achievement of a worldwide carbon-neutral air transport.

Summary of Recommendations:

We recommend European politicians to focus efforts on working with the civil aviation and aeronautics sector on providing support for concrete measures to tackle its decarbonisation challenges while recognising the need for the European civil aviation & aeronautics sector to stay competitive globally.

2. Accelerate innovation and double EU public funding for civil aviation research

Civil aeronautics products are among the most complex manufactured and integrated systems, as they must comply with exceptionally high requirements on safety, efficiency, reliability, and operate over a wide spectrum of environmental conditions throughout their life cycle. The next generation of aircraft (fixed wing and rotorcraft) and ATM systems will be based on a wide span of innovative technologies that will need to be matured, worked through, developed and certified at European level.

Delivering future generations of aircraft must hence be a European priority and the support must continue to be driven by the continuous effort to research and develop cutting-edge technologies for low-carbon aircraft and the anticipation of future aircraft systems and architectures, as well as future propulsion solutions. This can only be achieved through an appropriate, dedicated strong increased support for civil aviation research in the next MFF enabling support for all sub-segments of civil aviation and aeronautics (large commercial aircraft & engines, ATM technologies, aircraft systems & equipment, civil helicopters, regional aircraft, business jets, MRO, general aviation & advanced air mobility).

The upcoming FP10 instruments should be a simple, flexible and constant financing tool with the aim of supporting the competitiveness of the entire value chain, ensuring the preservation of the environment and the influence of related standards, the guarantee of sovereignty and the development of resilience.

Thanks to constant political and financial support, the European civil aeronautics industry has succeeded in acquiring a global leadership position. Maintaining this position and increasing its

autonomy considering increased and aggressive competition from other regions, in particular USA and China, is of paramount importance. There should be no complacency as the level of competition stemming from the US aeronautical industry is increasingly aggressive, benefiting from massive public research and innovation funding, while China has now broken the long-standing duopoly in the large commercial aircraft industry.

The European ecosystem has already demonstrated its commitment and ability to reduce its environmental footprint over the decades. It has undertaken major efforts to decarbonise the sector, through new technologies such as sustainable aviation fuels (SAF), ultra-efficient, hybrid-electric and hydrogen propulsion, optimised flight operations and innovative air traffic management technologies. The successive Clean Sky and SESAR federative programmes have been, and are today via Clean Aviation and SESAR, the central components of this European initiative. An increased budget and a fully dedicated instrument (including Clean Aviation, SESAR and collaborative research) is required compared to Horizon Europe to match the sector's high ambitions to reach climate neutrality by 2050 and to fulfil the Digital European sky. **A doubling of EU public funding for civil aviation research in next MFF and research framework is a minimum**, in line with the Draghi Report recommendations to double the overall EU budget for research.

Moreover, it is essential that this be a **ring-fenced budget for civil aviation research as part of a standalone FP10 programme and based on existing Clean Aviation, SESAR and collaborative research instruments**.

We would recommend, in line with the ARIS initiative (Home | Aviation strategy), **6 billion Euro** EU public funding for civil aviation research in the next MFF across the whole TRL spectrum (5.3 billion Euro for aircraft technologies and 700 million Euro for ATM).

Moreover, the existing ETS Innovation Fund could benefit from simplified administrative procedures and improved selection criteria for aviation projects. To enable the civil aviation sector to meet its net-zero goal, consistency with the estimated effort should be met: **we recommend allocating at least 20–25% of the future ETS Innovation Fund for civil aviation decarbonisation efforts**. The adaptation of the Innovation Fund selection criteria is critical, so that projects related to the aviation development cycle and SAF can be prioritized. Currently, the criteria and application process are neither adapted to enhance the development of innovative aviation decarbonized technologies nor sufficiently aligned with the specific needs of SAF production.

A ring-fenced budget for civil aviation for the next MFF is essential. Funds should be specifically used for aviation cleantech and SAF-related projects, including advanced biofuels and synthetic e-fuels (Power-to-Liquid). With the Innovation Fund projected to raise over €40 billion by 2030, earmarking this portion for SAF is both feasible and necessary to address sector- specific decarbonization priorities as well as competitiveness and sovereignty considerations.

Summary of Recommendations:

- **We recommend a ring-fenced civil aviation research budget of at least 6 billion Euro in the next MFF**
- **We recommend allocating at least 20-25% of the future ETS innovation fund for civil aviation decarbonisation efforts**
- **We recommend keeping the upcoming Framework Programme 10 (FP10) as a simple tool with long term funding stability based on existing proven instruments Clean Aviation, SESAR and collaborative research**

3. Strengthening the industrial component of civil aeronautics

The European civil aeronautics industry consists of a dense eco-system of prime contractors (consisting of aircraft (both fixed wing and rotorcraft) manufacturers, engine manufacturers, systems integrators & supply chain companies, ATM technology manufacturers and MRO companies. Whereas the prime contractors are typically based in the larger countries (France, Germany, UK, Spain and Italy), they rely on dense network of suppliers with facilities across Europe and its many regions. Each aircraft which is released from the final assembly line includes components which have been built in many European countries.

The European aeronautics supply chain must transform, modernize and strengthen itself in order to cope with the ramp-up linked to growing demand due to the ongoing renewal of fleets. On the other hand, it must anticipate and address the gradual arrival on the market of new materials, green and digital technologies, which may require the adoption of new, more modern, more automated and also more resource-efficient production methods. In a highly tense geopolitical context, where international supply chains will be profoundly and lastingly disrupted, the European supply chain must be considerably strengthened and find autonomous and resilient solutions to ensure its supply of critical raw materials and components.

The European civil aeronautics industry is also a strong engine for economic growth and employment in many peripherical regions (outside the main capital cities). A few examples of regions with significant aerospace clusters are the Occitanie Region (France); Campania Region (Italy), Rzeszów Polish Aviation Valley (Poland), Andalusia Region (Spain), Bavaria Region (Germany), East Midlands Region (UK), Moravian Aerospace Cluster (Czech Republic), Walloon Region (Belgium) and many more.

Strengthening the industrial component of civil aeronautics is therefore also an essential element for regional development and prosperity.

Moreover, civil aeronautics is part of the wider aerospace & defence eco-system with many shared facilities and crossovers in terms of technological development. Strengthening the civil aeronautics industrial base is therefore also important for defence & space since the large volumes of the civil aeronautics market provide synergies enabling a more efficient supply to the defence & space sectors as well as for example through dual-use technologies.

Apart from the crucial importance of continued increased funding for Research & Innovation (already discussed in chapter 2), there are many other actions needed to strengthen the industrial base for civil aeronautics:

- Securing Critical Raw Material (CRM) needs for civil aeronautics
- Tackling the uncompetitive European Energy Costs
- Work on Advanced Materials and Processes
- Secure critical components (semiconductors, permanent magnets etc)
- Support industrial decarbonisation
- Support digital Transformation of Industry
- Ensure that EASA is equipped to certify European technology on time

3.1 Securing Critical Raw Materials for civil aeronautics

The dependence of the civil aeronautics industry on critical raw materials (CRM) is not only a matter of aircraft performance, safety and efficiency, but also a strategic imperative for Europe's industrial sovereignty and decarbonisation ambitions. The transition towards more electric aircraft, hydrogen propulsion, and sustainable aviation fuels (SAF) is accelerating the demand for specific materials, while geopolitical tensions, supply chain vulnerabilities, and environmental regulations are exacerbating supply risks. The lack of European strategic autonomy regarding CRM local supply chains – especially for refining, processing and recycling – threatens the competitiveness and resilience of the aerospace and defence sector, including civil aeronautics.

Examples of critical raw material essential for civil aeronautics:

- Aluminium (Al) and Aluminium-Lithium Alloys: widely used in fuselage and wing structures, lighter AL-Li alloys are increasingly adopted to reduce weight. Europe has lost a lot of local production capacity (for unwrought aluminium the EU is import reliant for about half of it consumption, source JRC Study https://rmis.jrc.ec.europa.eu/uploads/library/jrc125390_sustainability_profile_bauxite__aluminium_online.pdf) due to soaring European energy costs;
- Beryllium (Be): used in specific high-performance components (i.e. avionics/gyroscopes,weather radars)
- Carbon & carbon fibers: while carbon isn't rare, high-quality carbon Fibers used in composites rely specialized production processes with limited global suppliers.
- Chromium (Cr) & Vanadium (V): alloying elements in steel and titanium alloys to enhance strength and corrosion resistance;
- Cobalt (Co): also used in superalloys for turbine blades and discs, critical for high-temperature performance;
- Copper (Cu): used in key components for the electrification of the aircrafts (wiring, motors, power electronics);
- Magnesium (Mg): lightest structural metal, used in some interiors parts and specialty alloys;
- Nickel (Ni): key component in superalloys for jet engine turbines and hot section parts, battery systems for hybrid/electric aircrafts;
- Tantalum (Ta): strategic for high-reliability electronics (capacitors) and some high-temperature applications, supply and refining chains remain concentrated and vulnerable to export control regulations;
- Titanium (Ti): used in airframes, landing gears and engines due to its high strength-to-weight ratio and corrosion resistance. Imports cover at least 60% of EU's consumption of wrought titanium; Russia & China are major global suppliers, raising supply security concerns;
- Tungsten (W) & Rhenium (Re): critical in certain high-temperature engine components, rhenium is particularly scarce and tungsten refining is currently overwhelmingly concentrated in one country;
- Rare Earth Elements (REEs): especially samarium, neodymium and dysprosium for high strength permanent magnets in actuators, electric systems and more electric aircraft components, but also Yttrium (Y) – essential for thermal barrier coatings and specialty chemicals in aero engines – as currently, refining and oxide supply are highly concentrated outside the EU;

Other regions (such as in particular the USA) have recently accelerated efforts to reduce critical raw materials dependencies on China and to ensure their own strategic autonomy.

The US government has recently announced direct investments in various CRM mining & processing facilities including a 10% stake in Trilogy Metals to support mineral development in Alaska, the Pentagon procuring up to 1 billion US$ in critical minerals to build up strategic stockpiles, The US Department of Energy to provide 1 billion US$ funding for local mining & processing, the 400 mU$ Us DoD investment in MP Materials and US government stakes in Lithium Americas.

It is essential for Europe' s strategic autonomy, that Europe does not stay behind. There is no competitive European civil aeronautics industry without access to critical raw materials at affordable cost. It is therefore essential that civil aeronautics is (along defence and space) prioritised under European CRM initiatives.

Summary of Recommendations:

- **Support local mining & processing facilities to increase strategic autonomy**
- **Recognize the entire aerospace and defence eco-system as a priority sector for critical raw material access;**
- **Give priority in the EU CRM Act for projects related to the supply of the aerospace and defence sector and, if relevant, consider potential joint purchasing through the upcoming EU Centre for raw materials and conditioning EU funding on maintaining supply for the sector;**
- **Identify and support secondary raw material sources (recycling) and permanents magnets recycling synergies with other industrial sector (automotive for instance);**
- **Secure supply through the acceleration of the negotiation or the implementation of existing trade cooperation agreements with "like-minded" partners (e.g. EU-Canada on Cobalt, EU-Japan on Titanium, EU-Australia for Rare Earth Elements (REE), EU-Africa for basic raw materials mining etc);**
- **Create fast-track EU projects for Rare Earth Elements (REE) separation, Samarium (Sm) and Yttrium (Y) oxides, and magnet metallization (including aerospace-grade SmCo (SamariumCobalt) within the single market, and include targeted OPEX support until scale is reached;**
- **Establish EU-backed strategic stockpiles for critical oxides and alloys (Sm, Y, Ta, W) dedicated to aerospace safety-critical uses, with transparent draw-down rules;**
- **Enable long-term offtake contracts (with EU/Member states guarantees) to underwrite new non-China capacity in the EU and allied countries (Australia/Canada/EEA/UK, etc)**
- **Create a new aerospace and defence dedicated cluster in the European Raw Materials Alliance (ERMA) in consultation with EIT Raw materials managed by the European Institute for Innovation and Technology (EIT)**

3.2 Tackling the uncompetitive European energy costs

Europe is facing soaring energy costs (both for electricity and gas) well above prices paid in other regions of the world (such as in particular the USA and China). In H2 2024, European electricity prices are more than double prices paid by industrial users in the USA and gas prices whereas industrials gas prices in Europe between 3 to 5 times higher.

This huge price differences makes European industry uncompetitive at global level. The European civil aeronautics industry is affected by this both directly (for direct energy use in factories – in some European factories energy costs account for 10% of total cost well above energy costs in comparable plants outside Europe) and indirectly due to soaring energy costs driving energy intensive industrial suppliers (steel, aluminium, chemicals) out of Europe and therefore hampering European strategic autonomy.

European soaring energy costs are to a large extend self-inflicted due to overregulation and lack of attention to competitiveness and pricing. **It is therefore high time for a different European Energy Strategy which balances decarbonization with competitiveness and which is technology neutral.** Lowering European energy cost is a matter of survival for European industrial production in Europe and is therefore also essential for Europe's strategic autonomy.

Summary of Recommendations:

- **Develop and implement together with the European Member States a different European Energy Strategy which balances decarbonization with competitiveness and which is technology neutral. Lowering European energy cost is key for the wider industrial ecosystem's competitiveness.**

3.3 Work on Advanced Materials and Processes

The modernization of manufacturing capabilities (additive manufacturing, semiconductors foundries, advanced materials) is essential to enable the civil aeronautical industry to be able to ramp up production of innovative civil equipment in the future. Many of the enabling technologies should therefore also be considered as Clean Technologies as defined under the EU Net-zero Industry Act (NZIA).

Materials

Advanced materials and processes will be crucial for the future of civil aeronautics, enabling lighter, stronger, more fuel-efficient, and more sustainable aircraft. This includes the increased use of composites like carbon fiber reinforced polymers (CFRPs), titanium alloys, and aluminium-lithium alloys, as well as the development of novel materials like nanomaterials and shape memory alloys. These advancements will lead to reduced fuel consumption, lower emissions, and improved aircraft performance.

In the aerospace industry, composite materials are widely used to reduce weight while maintaining high strength and durability, which directly improves fuel efficiency and overall aircraft performance. They are made by combining reinforcing fibers, such as carbon or glass, with a polymer matrix, typically epoxy or thermoplastic resins, to create structures that are both lightweight and resistant to fatigue, corrosion, and extreme environmental conditions. Their design flexibility allows for the production of complex shapes with fewer joints, which improves aerodynamics and reduces maintenance needs. Moreover, ongoing innovations in thermoplastic composites and recycling processes are helping the aerospace sector meet sustainability goals while keeping high safety standards. However, their production relies on advanced know-how, costly equipment, and secure access to raw materials such as carbon fibers and resins. By strengthening a sovereign composite industry, the EU can ensure autonomy in a critical technology.

The use of AI and Supercomputers could open a new era in materials research & development. This

could result in the discovery of novel materials as never seen before with potential applications for the civil aeronautics industry.

Processes

In civil aviation, machine tools are critical for producing the many precise parts that make up an aircraft. These machines, such as milling centers, lathes, grinders, and drilling systems, are used to cut, shape, and assemble metals and composites with extreme accuracy. Because aircraft components must meet very strict safety and performance standards, machine tools ensure that every piece, from turbine blades to landing gear parts, is manufactured within very tight tolerances. They also allow the production of complex shapes and lightweight structures that help reduce fuel consumption and improve efficiency. Without modern machine tools, it would not be possible to build safe, reliable, and high-performance airplanes – including maintaining them as it ensures that critical upgrades and spare parts are reliable. Machine tools incorporate many advanced technologies: precision mechanics, control systems (CNC), software, robotics, automation, sensors, often proprietary. Maintaining and developing these capabilities in Europe are therefore key for its sovereignty.

Additive manufacturing (AM)

Additive manufacturing, also known as 3D printing, is transforming the aeronautical industry by enabling the design freedom, weight reduction, rapid prototyping and more efficient production of highly optimized parts. In aeronautics, every gram matters: lighter components lead to lower fuel consumption, reduced emissions, and higher overall system performance. With AM, engineers can design complex internal geometries – lattice structures, conformal cooling channels, consolidated parts – that would be impossible or extremely expensive via conventional methods.

Beyond performance, AM accelerates innovation cycles. Instead of waiting weeks or months for molds and tooling, prototypes and iterations can be produced in days, enabling rapid validation of new designs. Additive manufacturing also can play a key role in novel MRO procedures.

The aerospace additive manufacturing market is growing rapidly. In 2024, it was valued at approximately 5,4 billion US$ and is projected to reach nearly 19.6 billion US$ by 2033 (source: Imarc Group).

Europe could support this emerging sector by dedicated support for R&D and avoiding overregulation.

Circularity

Overregulation in the field of circularity should be avoided. At the same time there is a need for positive support measures to further develop the circular economy.

New materials and new processes would open the way for re-use/recycling materials and to find new processes capable to develop re-generated materials for the industry in order to safeguard critical raw materials. Material circularity allows to minimize resource use and optimize the disposal of materials. This ensures a lower carbon footprint across product lifecycle and improves its overall environmental impact. Lack of a strong European recycling value chain, adapted to our ecosystem's needs (end-of-life product, batteries, secondary raw materials) is an obstacle to the diversification of supplies.

Moreover, due to the strict safe criteria for civil aviation, the European civil aeronautics industry cannot just use off the shelve novel materials. All materials have to be properly tested based on civil aviation safety standards before they can be implemented on a civil aircraft.

It is therefore essential that civil aeronautics needs are prioritized in the European work on advanced materials following the Advanced Materials initiative for lead.

Summary of Recommendations:

- **Allocation of available EU funding to dedicated civil aeronautics projected related to advanced materials and processes.**
- **Ensure more risk-based EASA rules for additive manufacturing procedures to enable a quicker adoption of new processes while guaranteeing safety.**
- **Funding of shared testing infrastructures and shared data infrastructures.**
- **Funding of innovative processes and infrastructures for treatment of scraps aimed to the relevant reuse.**
- **Promotion and funding of innovative logistics based on collection and distribution centers for scraps transformation.**
- **Promotion and development of additive manufacturing for use in civil aeronautics: developing a truly skilled value chain from small and medium-sized complex components to large simple components.**
- **Support to material circularity: specific policies for technical validation, e.g., certification criteria of refurbished-reused-recycled materials and components and where available EU funding for research. At the same time overregulation and additional red tape in the field of circularity should be avoided.**

3.4 Secure critical components (i.e. semiconductors, batteries, permanent magnets)

Critical components — such as semiconductors, batteries, and permanent magnets — are the backbone of next-generation civil aviation. Their availability, performance, and resilience directly impact safety, innovation, and Europe's strategic autonomy in the face of accelerating technological competition and geopolitical fragmentation. The transition towards more electric, hybrid, and hydrogen-powered aircraft, as well as the digitalization of air traffic management, amplifies the sector's dependence on these components, while exposing it to supply chain vulnerabilities, single-point dependencies, and obsolescence risks.

Semiconductors

Semiconductors are crucial components in the aviation industry, playing a pivotal role in various aspects of aircraft and Air Traffic Management (ATM) technology. In aviation, semiconductors are employed in various flight-critical systems and applications, from flight control systems and navigation equipment to communication devices and avionics. By enabling the efficient and precise control of electronic signals, semiconductors enhance safety, reliability, and performance in aircraft operations. As technology advances, semiconductors continue to evolve, paving the way for innovations in aviation, such as advanced autopilot systems, sophisticated sensors, and next-generation aircraft designs. In addition, semiconductors are also playing an essential role in factories which become increasingly digital.

Europe is leading on advanced machine technology to produce advanced semiconductors through

Dutch ASML's dominance in EUV lithography. Its machines are the sole solution for producing chips at sub-7nm nodes—the architecture required for AI, 5G, and high-performance computing. Europe is also still strong in domestic production of less advanced semiconductors (above 7 nm nodes).

However, Europe is significantly lagging behind in terms of advanced (sub 7 nm nodes) semiconductors production facilities which are concentrated in Taiwan (90% of the global market through TMSC), South-Korea (Samsung) and (to a lesser extend) the USA (through Intel trying to catch up) but rely on the advanced machines provided by ASML. In the EU Chips Act, possible financing should be conditioned to a commitment from producers to supply to civil aeronautics, defence and space industry with required old and new generations of semiconductors. Permanent production should be ensured to avoid supply shortages caused by obsolescence of components and avoid having to activate the crisis response.

The European civil aeronautics industry has a need for sufficient supply of both advanced (sub 7 nm nodes) and less advanced semiconductors. This is matter of strategic autonomy and essential to avoid disruption to industrial production.

Summary of Recommendations:

- **The civil aeronautics sector, along with Defence and Space needs, should be addressed in the forthcoming review of the EU Chips Act**
- **The EU should develop a joint strategy with allied nations (UK, Japan, South-Korea, Canada, Taiwan and if possible, the USA) to ensure supply for European aerospace and defence industry. Such a strategy should balance the need for strategic autonomy with cost effectiveness (doing everything in Europe might not be efficient).**
- **Europe should also leverage its leadership on EUV lithography machines, to protect supply of semiconductors to European industry and European interests and to avoid single dependencies.**
- **The EU should support the constitution of buffer inventories for safety-critical integrated circuits and analog/power devices, and co-fund multi-year framework agreements to stabilize pricing and lead-times.**
- **EU manufacturers should be encouraged to maintain production lines for the aerospace and defence sector as a precondition for accessing EU funds.**

Batteries for electric and hybrid aviation

The future of electric and hybrid aviation depends on permanent batteries that will pave the way to more electrical aircraft architecture addressing propulsive and non-propulsive energy needs onboard. EU efforts so far have been exclusively focused on battery cells and battery system assembly for the automotive sector – by unfortunately, strengthening our dependency to China/Taiwan cells and production means – thus forgetting to address the vertical integration required nowadays.

There is a need **to develop European players** capable of addressing this verticalization from the raw materials up to the battery system assembly as well as players capable of developing production capacity leading to European Sovereignty in producing batteries specifically **for the aeronautical sector**.

Summary of Recommendations:

- **Develop a production chain for batteries for aviation including production means.**
- **Develop strategic partnership with raw materials suppliers to enable sovereign batteries production in Europe including for the aeronautic sector.**
- **Address the specific needs of aeronautics in terms of safety and certifications rules along the overall Battery System Value Chain (From cells to Systems).**
- **Identify and support use of secondary raw material sources through recovery and recycling.**
- **Provide CAPEX + OPEX bridges and offtake guarantees for EU magnet value chains serving aviation (including Sm/Y oxides, metallization).**
- **Create a cluster dedicated to aeronautics within the European Battery Alliance (EBA) in close cooperation with EIT InnoEnergy to finally address the specific needs of the aeronautical sector.**

Permanent Magnets for global aviation

The future of aviation (electric propulsion, hybrid propulsion and more electric aircraft) depends on permanent magnets that are used in many equipment (actuators, pumps, generators…), and not only electrical motors.

As for Batteries, EU efforts so far have been exclusively focused on the automotive sector addressing the fierce competition with China on Neodymium-Iron-Boron (NdFeB) permanent magnets but forgetting the Samarium-Cobalt (SmCo) permanents magnet needed for aviation.

There is a need **to develop European players** capable of vertical integration from the Rare Earth Ore production up to magnets production as well as players capable of developing production capacities. This must be done through Strategic Partnerships with Western Countries like Canada or Australia that already have developed this vertical integration approach. Fostering the NdFeB initiative to address the SmCo needs as additional production capability should be a way to address this, as the investment should be lower. These European Players could then lead European Sovereignty by producing permanent magnets for **the aeronautical sector**.

Summary of Recommendations:

- **Develop a production chain for permanent magnets for aeronautics including production means from rare earth ore extraction to magnets production.**
- **Develop strategic partnership with REO Materials Suppliers to enable sovereign Supply Chain.**
- **Address the specific needs of aeronautics in terms of quality and grains.**
- **Identify and support secondary raw material sources (recycling) and permanents magnets recycling synergies with other industrial sectors (automotive for instance) but also with "like-minded" interested countries (Japan).**
- **Fund design-to-reduce-REE R&D while keeping Samarium-Cobalt (SmCO) available for harsh environments where substitutions are not yet viable**

3.5 Support industrial decarbonization

The civil aeronautics industry own emissions are relatively low compared to overall civil aviation emissions. Nevertheless, addressing those emissions is part of industry's priorities to become climate neutral.

The recently updated Destination 2050 roadmap (www.destination2050.eu) from the European aviation sector (ASD together with Airlines for Europe (A4E), European Regions Airlines Association (ERA), Airport Council International-Europe (ACI-Europe) and CANSO-Europe) shows that the European civil aviation sector is on the right decarbonization track but that meeting the 2050 goals will become increasingly challenging unless there is more European public support to make the industry's aspirational roadmap a reality.

Decarbonising the aviation sector requires substantial investment. The updated D2050 roadmap estimates total expenditures worldwide at **€2.4 trillion**; a 57% increase compared to the first edition in 2021. The majority of this increase stems from rising premium expenditures, which have grown from **€820 billion** to **€1.3 trillion** (+57%), driven largely by higher Sustainable Aviation Fuel (SAF) market price estimates. To meet these challenges, Europe must sustain and increase both private and public investment while fostering closer coordination and alignment among EU initiatives and Member States. This requires a clear, comprehensive, dedicated regulatory framework that ensures market stability, provides long-term certainty, offers strong incentives for private investment within the EU, and establishes a global level playing field.

To decarbonize industrial operations, companies are implementing strategies focused on energy efficiency, renewable/low carbon energy adoption, electrification, sustainable supply chain management, and process optimization. This includes reducing energy consumption, switching to renewable energy sources, electrifying equipment, engaging with suppliers on emissions reduction, and optimizing manufacturing processes.

Sufficient renewable/low carbon energy sources are not always available at affordable cost close to production facilities. It is therefore **essential that a share of available renewable/low carbon energy is allocated to the civil aeronautics industry for its own production**. Moreover, it is also essential to reduce the cost of energy (see section on energy) to ensure that Europe stays competitive with the rest of the world.

Summary of Recommendations:

- **Allocate a share of available renewable/low carbon energy sources for the decarbonisation of the civil aeronautical industry's own production**

3.6 Support digital transformation of industry

Staying ahead in the digital race is **crucial for guaranteeing the continued competitiveness and leadership of the European civil aeronautics industry**. This will encompass several key aspects: the ambitious transformation of our industrial system (Industry 4.0, including digital twins), a shift towards a digital and Cloud based supply chain management, wide application of AI technologies, reinforced cybersecurity safeguards, improved and simplified regulations - all dimensions relying upon an indispensable degree of EU digital sovereignty. T**he focus should be placed upon implementation and financing of concrete transformative industrial projects.**

Industry 5.0

Digitalization of industry **involves integrating digital technologies** (the Internet of Things, AI, robotics, cloud computing and analytics) to deeply transform traditional industrial processes and increase efficiency, automation, and data-driven decision-making throughout the value chain. Essentially, it›s about connecting machines, systems, and data to optimize operations and create new possibilities. This concept s applies and enforces the centrality of the people in order to integrate innovative human skills and technologies for enhanced capabilities. Therefore, initiatives of technology developments need to be complemented with change management practices and new training models based on a holistic approach

Digital twins

One of the most promising use cases for the sector is that of **digital twins**, which our industry aims to generalize across its entire industrial ecosystem (from production facilities to aircraft, Air Traffic Management and airports). For instance, industry has already begun to implement this for its products, but the next phase will focus on creating comprehensive digital replicas of its production and assembly facilities to optimise production and foster our ramp up:

- Model and simulate production flows to anticipate and eliminate future bottlenecks or simulate integration of an additional production capacity within existing infrastructure.
- Implement a central digital management system to control and optimize factory operations in real time (data from sensors on the physical floor to continuously update the digital twin), adjust production schedules and resources. Predictive maintenance will maximize efficiency and flexibility.
- Be more resilient and better adapt to changing market conditions, modelling the production implications and preparing faster for adapting production rates or substituting specific components.
- Develop Model Based System Engineering in the view of digital twin integrating and simulating the product in its entire lifecycle up to enabling customer support and services enhanced by digitalization.

Beyond industry's internal facilities, digital twins can be used to optimize broader operational processes. For instance, a digital twin of an airport will model air traffic flows, allowing for real-time adjustments to runway usage and taxiing routes. Moreover, this could be expanded to en-route trajectory optimisation (see section on ATM - see below). This would reduce idle time and cut fuel consumption, directly contributing to the aviation sector's sustainability goals.

Cloud computing

Cloud computing has emerged as a strategic asset, underpinning AI-driven systems, cross-border collaboration, and mission-critical operations. Cloud services are essential for innovation, operational readiness (including supply chain resilience and aircraft ramp-up) and secure cross-border collaboration.

Key use cases are already being developed and implemented and should be supported: the implementation of Cloud-based solutions will allow for a radical transformation of the supply chain, which currently relies on a traditional pyramidal structure, where information flows vertically and often slowly through a series of long, bilateral relationships—from OEMs to Tier 1 suppliers, and so on, down to the lowest levels of the supply chain. Industry should transform this into a modern hub-

and-spoke digital structure, leveraging a centralized cloud platform. This will create a collaborative, interconnected ecosystem that provides several critical advantages such as:

- Real-time and end-to-end cross border traceability (instead of manual checks at each stage, cloud-based systems will provide end-to-end visibility). For example, industry could instantly trace the origin of a specific component, its manufacturing conditions, and its certification status, supporting production and sales ramp up, significantly reducing compliance risks and ensuring improved quality control.
- Adaptive management for ramp-up, fuelling the EU competitiveness engine: in an industry defined by high-volume production cycles, a traditional supply chain cannot keep up. The new digital structure will enable real-time communication of production needs, allowing every supplier in the network to adapt quickly to changes in demand. This means if industry needs to increase production of a specific aircraft model, the entire network — from raw material providers to component manufacturers — will be instantly notified and can adjust their output accordingly.
- Big Data and Internet of Things (IoT): the record keeping requirements in civil aeronautics (including supply chain) are facing risks and opportunities linked to their amount, connections, governance, protection, availability and long term archiving In order to bring this vision to life, industry leaders are establishing Aerospace X (in Germany) / Decade-X (in France), a common industry data space dedicated to the aerospace and defence supply chain. This project will significantly improve the management of the supply chain and should be supported as a critical asset for the EU.

However, the European Union (EU) remains heavily reliant on non-European cloud providers, with U.S.-based hyperscalers dominating the market. This structural dependency poses serious risks to the EU's digital autonomy, especially as geopolitical tensions and cyber threats increase. For Europe to maintain its technological sovereignty, especially in highly sensitive sectors, a secure, sovereign, and interoperable cloud ecosystem is essential.

One of the most significant challenges to cloud adoption in the European aerospace, defence and security sectors is the lack of harmonised security standards, particularly regarding the handling of classified and sensitive data. The **lack of an EU-wide certification scheme for sovereign cloud services creates legal uncertainty and limits the ability of customers to assess EU sovereignty guarantees**.

Addressing this shortfall is essential to accelerate the adoption of European cloud infrastructure and to foster a thriving "cloud BY Europe" ecosystem. The EUCS High+ criteria can serve as strong inspiration in this regard. The assessment could be based on:

- The location of the provider's head office and central administration within the EU.
- The place where key operational and management decisions are made.
- The service provider is not controlled, even jointly, by non-EU stakeholders.

This approach would help ensure that security and compliance functions align with the underlying sovereignty objectives. Additionally, consideration should be given to whether non-EU actors could, through other means e.g., specific restrictions, impede the provision or quality of the service. In other words, the criteria, subject to refinement, should guarantee immunity from non-EU extrater-

ritorial reach, both regarding undue access to data and potential disruption of service.

Artificial Intelligence

AI, pre-trained AI models and AI services are increasingly used in industry processes and therefore become strategic assets as we have been leveraging AI (not necessarily generative AI) for decades as an enabler of breakthrough products.

A few examples of use cases already deployed in the sector include tools to assist pilots during the most critical phases of flight, such as take-off and landing or in case of crew incapacitation. Other examples include vision-based landing systems and AI-powered voice recognition for air traffic control communications. There are also platforms in place that enable predictive maintenance for the highest aircraft reliability and cost reductions that boost the airlines' competitiveness. In the same way AI can be combined with robotics and computer vision in order to support manufacturing and quality control processes in order to improve efficiency and safety up to enhancing customer support and services.

And thanks to the sector's duality, it benefits as well from developments in the defence and space domains, such as AI-based computer vision applied to precise navigation in space exploration missions, or command and control systems for UAV swarms.

As stated in the EU AI Action Plan, the acceleration of AI adoption in strategic sectors will be key. Therefore, swift implementation of the Apply AI Strategy, including dedicated initiatives for aerospace and defence, will support both the sector's digital transformation and the continent's broader uptake of AI. This is because we develop methods for AI that meet extremely stringent certification requirements in terms of robustness, explainability, and bias detection, and which can serve other sectors as well. In this context it is also essential to avoid overregulation which could stifle innovation. The implementation of the EU AI Act should be paused.

Cybersecurity

As a strategic and sensitive sector, where safety is paramount, aviation and aeronautics apply particularly stringent cybersecurity safeguards. That is why we need a fit-for-purpose cybersecurity framework, including:

- Harmonized and simplified cyber regulations and reporting, by relying more on regulations and less on directives, aligning sectorial (e.g., EASA Part-IS) and horizontal (e.g., NIS2) regulations and certifications, implementing a "report once, share many" model towards designated national authorities (for swifter cross-border threat analysis & response). Recognize as well the need for cyber rules which are practical for application by SMEs.
- Leveraging Non-Legislative Tools by harmonizing cybersecurity funding mechanisms across programs like the European Defence Fund, Digital Europe, and Horizon Europe. Public-Private Partnerships could also facilitate threat intelligence and best practice sharing, especially for SMEs. This is particularly relevant for our large supply chain. Comprehensive rulebooks and guidelines should also be developed for implementing NIS2 and CRA requirements.
- Harness investment to allow the emergence of leading EU cybersecurity players, notably with regard to post-quantum encryption. This also means ensuring proper cooperation between Member States to avoid undue non-EU investment in such companies. Investigation teams able to address cybersecurity attacks would also need to be reinforced, both through additional resources and through improved transnational and EU coordination.

Information security is one of the main issues considered when industry is asked to provide information on critical technologies / dependencies. A secure system for collecting data on supply chains and critical technologies (such as establishing a black box system for companies to transmit sensitive information securely, as well as transparency in the collection /data management/forwarding)

are prerequisites as many aerospace technologies are dual,

Digital sovereignty

Last but not least, in a cloud-oriented and AI-powered data economy, the starting point needs to be the EU's commitment to a sufficient degree of digital sovereignty, in particular for strategic and sensitive needs.

This means fostering emergence and development of EU suppliers and solutions throughout the entire digital value chain and developing the necessary regulatory framework. In particular, EU standards, such as or inspired from the voluntary EUCS High+, to allow users to know whether potential providers would offer robust enough solutions, including from an extraterritorial influence perspective, to secure their sensitive data. The risk here lies in potential service disruption or undue data capture.

Establishing such standards at EU level will lower barriers of use for all types of companies, ensure homogeneity and avoid fragmentation within the EU, creating the basis and scale needed by EU digital players to develop.

Sovereign alternatives are also needed for AI. Our AI in-house capabilities are solid regarding "traditional" AI models but insufficient to build a Foundational Model. The development of such sovereign models, which consumes processing power only available in a cloud environment, should therefore be supported by the EU as a priority.

Summary of Recommendations:

- **Provide EU financial support to key industrial digital transformation projects and cybersecurity capabilities,**
- **Establish an EU-wide certification scheme for sovereign cloud services (based on EUCS High+),**
- **Provide within the EU AI Action Plan dedicated financial support for key Artificial Intelligence initiatives for aerospace & defence,**
- **Avoid overregulation in the field of Artificial Intelligence (AI) and pause the EU AI Act,**
- **Ensure more harmonized and simplified cyber regulations and reporting, by relying more on regulations and less on directives, aligning sectorial (e.g., EASA Part-IS) and horizontal (e.g., NIS2) regulations and certifications. Ensure that rules are also practical for application by SMEs.**
- **Leveraging Non-Legislative Tools by harmonizing cybersecurity funding mechanisms across programs**
- **Harness investment to allow the emergence of leading EU cybersecurity and AI players**
- **Support digital transformation roadmap through change management and training initiatives**

3.7 Ensure that EASA is equipped to certify European technology on time

The European Aviation Safety Agency (EASA) is a critical executive agency, indispensable to our strategic sector. **It plays a key role in certifying new aircraft & engines and as such plays a key role in enabling the deployment of European technology on the global civil aviation market.** EASA's

mission to ensure aviation safety is of fundamental importance and must remain uncompromised. As safety challenges evolve with disruptive technologies and increased complexity, the workforce must also adapt to evolving standards to ensure continued compliance and safety excellence. It also plays an active role in defining international standards, which contributes to EU sovereignty. On top of its world-leading role in ensuring aviation safety, industry appreciates the active role of the agency in accompanying the implementation of the EU environmental and digital roadmaps to our sector. **Early involvement of EASA in research and innovation activities**, in close collaboration with all interested parties and stakeholders, is essential to anticipate regulatory needs and accelerate the safe integration of new technologies. 2/3 of EASA's budget is funded by industry (through EASA fees and charges) and 1/3 from the EU public budget. To continue supporting the aviation and the aeronautics industry in the years and decades ahead, EASA needs an adequate and sustainable financing scheme.

It is therefore essential to protect EASA's public funding from any cuts in the next MFF. We stress that the EU already lacks a level-playing field *vis-à-vis* the US, where the FAA is fully financed by the US government. This negatively impacts our industrial competitiveness at a time when this has been identified as a top priority for the EU.

EASA is today already facing severe resource constraints due mainly to the fact that new responsibilities have been assigned to EASA with neither additional dedicated funding nor resources. Outside the scope of the current amendment, the assignment of functions from the Commission should be coupled with the necessary public funding increase.

ASD also supports the need to look at changes to EASA internal procedures & efficiency to ensure that they best serve safety needs while avoiding unnecessary burden for industry. In this context, better use could be made of EASA resources through the full implementation of the level of involvement concept based on a more risk-based approach. **ASD fully supports the EASA simplification initiative** which should be an opportunity to make EASA rules & procedures more performance based.

EASA also **plays a key role toward third countries** in the field of aviation safety and in leveraging European position as the forerunner of worldwide new certification frameworks. Many EASA **technical cooperation projects (financed through the EU External Action Service**) in third countries, including partnerships with National Aviation Authorities (NAAs) are of great benefit for aviation safety and for promoting the EU industry interests in those third countries. It is **essential that those projects continue to receive support in the next MFF with a level of funding equal to the current MFF.**

Summary of Recommendations:

- **Protect EASA's public budget from funding cuts in the next EU MFF**
- **Make further improvements to EASA internal procedures & efficiency**
- **Support the EASA Simplification Initiative.**
- **Continue to provide within the next MFF, funding for EASA technical cooperation projects in third countries**

4. Support the modernisation and digitalisation of Air Traffic Management (ATM) led by the SESAR Joint Undertaking

ATM modernisation is a key element for the EU's strategic autonomy as this hinges on our technological leadership. In this field, we face two critical races we absolutely must win. First, the race for capacity. We must safely manage the growth from today's peaks of 35,000 flights a day to a projected 50,000 by 2035. Second, the race to decarbonise, where modernising our ATM is a low-hanging fruit, offering the potential to cut flight emissions. Winning both, while maintaining the highest levels of safety, is fundamental to Europe's leadership. However, our fragmented airspace, with its patchwork of systems, puts us at a disadvantage compared to global partners who are investing heavily.

In today's complex geopolitical landscape, a sovereign European sky depends on a secure, resilient and unified air traffic management system. We must be able to securely share vast amounts of data in real time across the network, relying upon sufficiently sovereign solutions.

This is where SESAR is our strategic advantage. Based upon the ATM Master Plan, it is the collaborative engine that develops the world-class digital technologies we need to transform our airspace into the world's most efficient and environmentally friendly sky. These technologies will also enhance our collective resilience, from secure, cyber-proof digital networks to advanced tools for civil-military cooperation. This ensures our airspace can adapt to disruptions, whether from geopolitical events or security threats.

Moreover, SESAR ensures that our top-of-the-line ATM industrial ecosystem remains on the cutting edge of technology. While for the airborne segment, it ensures that aircraft operate at their full potential, ultimately bringing more connectivity and growth to Europe and cementing our industrial leadership for decades to come.

The results are there: €1 invested in deployed SESAR-developed systems already resulted in €1.5 of monetised performance benefits in 2023, which is expected to grow to €3.7 in 2030, €5.8 in 2035 and almost €8 in 2040. At the same time, this will bring about 10 million tonnes of GHG emissions savings.

Last but not least, the European Air Traffic Management (ATM) Technology industry, with European global leaders such as Indra, Thales, Leonardo, SAAB and Frequentis, has a market share of around **60% of global ATM infrastructure sales.**

This European leadership should not be taken for granted. Under the US Infrastructure and Jobs Act (IIJA), **the FAA is set to invest 25 billion US$ over 5 years** for airport and Air Traffic Control infrastructure improvements. Those FAA investments will largely benefit local US industrial players. **Europe cannot afford to stay behind**. Continued funding for SESAR (both research and deployment) is also essential to ensure the continued global leadership of the European ATM industry.

Therefore, continued SESAR funding and support based on the existing instruments (SESAR Joint Undertaking and Deployment Manager) beyond 2027 for research and innovation and deployment is essential. Political support for SESAR is essential to create incentives for early movers, accelerate key SESAR technology developments, and maintain collaboration, digitalisation, and climate impact reduction. In addition, continued support for SESAR is also essential for the competitiveness of the European ATM technology industry and to ensure its continued leadership at global

level. Deployment of SESAR solutions are not limited to Europe.

At least €700 million is needed in the next MFF to continue SESAR research through the SESAR Joint Undertaking. In addition, deploying SESAR technologies is essential to make European skies the most environmentally friendly skies in the world based on digital technologies. Accelerating deployment will require public funding support to provide incentives to early movers. The funding for SESAR deployment (as per Connecting Europe Facility in the current MFF) should be continued in the next MFF. **At least 3 billion Euro public funding would be needed for 2031-2050 for SESAR deployment** (out of a total deployment cost of 22 billion Euro for 2031-2050). This would translate **to a need for 1.5 billion Euro, EU public funding for SESAR deployment in the next MFF.**

However, this is not enough. **Efforts in R&D and deployment need to be complemented by a fresh approach to overcoming fragmentation.** This digital infrastructure needs to be put to good use by defining optimal trajectories early across the network, with the support of the necessary processes and incentives to implement them. This is a necessary step to reap the benefits of the investments being made. Moreover, a smart and supportive regulatory framework that encourages early adoption and ensures interoperability across borders is a key enabler. Getting this right will ensure that our industry remains competitive and our skies become even safer, more efficient and more sustainable.

Summary of Recommendations:

- **Keep existing SESAR Joint Undertaking and SESAR Deployment instruments as essential tools for modernizing the European skies and ensuring the continued global leadership of the European ATM technology industry**
- **Provide at least 700mEuro funding in the next EU MFF to continue SESAR research**
- **Provide at least 3 billion Euro funding in the next EU MFF to support SESAR deployment**
- **Implement a smart and supportive regulatory framework that incentivizes early movers of new technology and to avoid fragmentation**

5. Support civil aviation decarbonization

Whilst reducing aviation impact on climate change, both on CO2 and non-CO2 aspects is an imperative, it represents also a **strategic opportunity for Europe**.

As one of the most visible sectors in the climate debate, the hard-to-abate aviation industry must achieve net-zero CO_2 emissions by 2050 in order to preserve its societal licence to operate. Meanwhile, this transition provides Europe with an opportunity to demonstrate Europe's global leadership in sustainable innovation, maintain and even strengthen industrial sovereignty and protect high-value jobs throughout its integrated supply chain.

As emphasised in the Mario Draghi report, Europe's long-term prosperity relies on its ability to pioneer disruptive technologies and implement them on a global scale. The field of civil aeronautics is therefore the perfect arena in which to realise this ambition.

The decarbonisation race is therefore an industrial race. Ensuring that the next generation of sus-

tainable aircraft is designed, developed, manufactured and operated in Europe is essential to reinforce strategic autonomy and maintain global competitiveness. Early adoption, large-scale demonstration projects and accelerated certification processes will be key enablers.

Europe's aviation sector has collectively committed to lead the way in reducing aviation CO_2 emissions, making flying more sustainable for the long term. Europe's airlines, airports, aerospace manufacturers and air navigation service providers have laid out a joint **long-term vision along with concrete solutions to the complex challenge of reaching net zero CO_2** emissions from all flights departing the EU, UK and EFTA as part of the Destination 2050 **initiative**. This European initiative complements global efforts through ATAG's Waypoint 2050 initiative.

In terms of decarbonisation efforts, the aviation industry has achieved remarkable progress in recent years, particularly in aircraft innovation and sustainability:

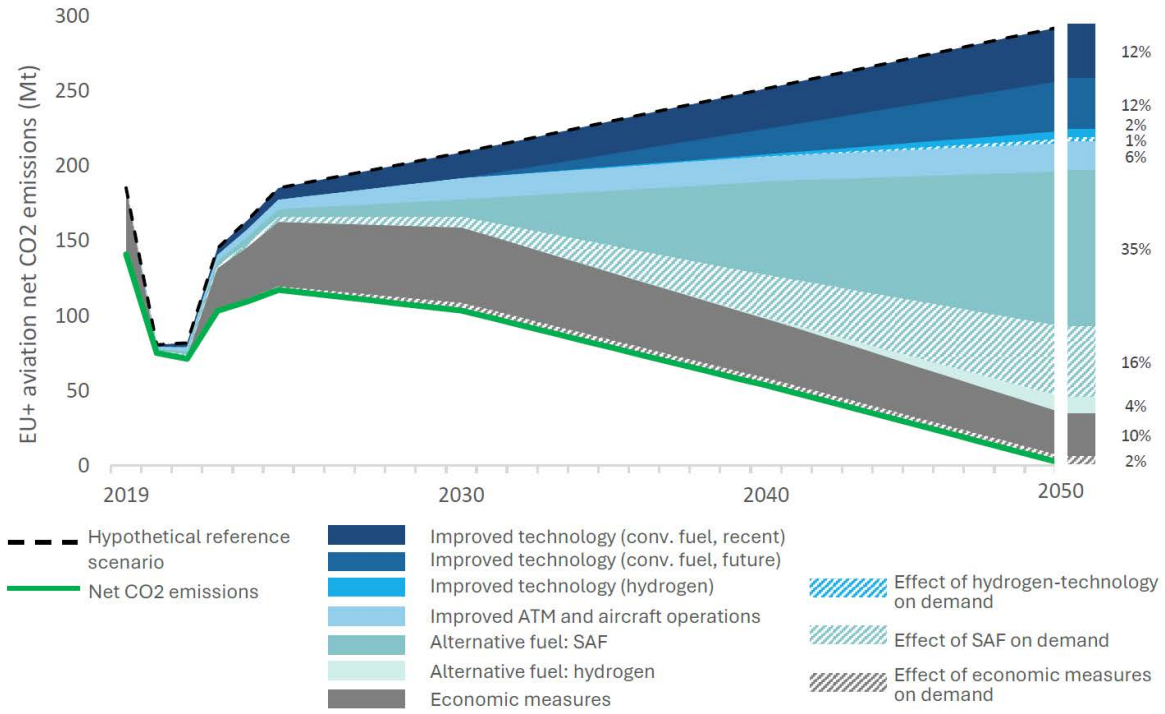
- **Next-generation aircraft**: Original Equipment Manufacturers (OEMs) have introduced a new generation of aircraft that achieve **20–25% lower CO_2 emissions** compared to previous models. Today, **30% of the global airline fleet** operates these advanced aircraft, with **70% still to be delivered**. This transition promises a significant reduction in air transport's emissions.
- **Investment in future technologies**: Aircraft OEMs, engine manufacturers, system and equipment suppliers as well as their whole supply chain are investing significantly in new technologies to drive further emissions reductions. The next generation of aircraft, expected to enter service within the next decade, aims to deliver a step-change in efficiency. According to ATAG, the civil aerospace industry spends **15 billion USD (14.41 billion EUR) annually** on efficiency-related research and development. To ensure competitiveness in the aerospace industry, technology and products must be developed to the right level of maturity. However, these efforts will be insufficient if the production system and manufacturing technologies are not also addressed at the same time. Indeed, the production system has mainly been updated incrementally over the decades and must be completely renewed and transformed to meet the new, increased productivity requirements of OEMs. In addition, it is important to stress that disruptive technologies will first emerge in the regional and short-haul segments, where smaller aircraft provide a lower-risk environment for testing before being scaled up to larger aircraft categories. This is particularly relevant for the regional aviation sector. Regional routes typically involve shorter flight durations, lower passenger loads and a higher frequency of operations, making them ideal testbeds for innovations such as hybrid-electric propulsion.
- **SAF compatibility testing**: OEMs have conducted extensive testing of current and next-generation engines and aircraft using up to **100% Sustainable Aviation Fuels (SAF)**. These tests demonstrate SAF compatibility and ensure that technology is not a barrier to SAF adoption.
- **Airline commitments to SAF**: **Fifty airlines**, representing **40% of global air traffic and jet fuel use**, have voluntarily committed to offtake SAF, targeting **5–30% of their jet fuel use by 2030**.
- **SAF production expansion**: On the supply side, numerous new SAF production facilities have been announced in recent years. In 2023 alone, approximately **500,000 tonnes of neat (unblended) SAF** were produced and blended with conventional fossil fuels[4].

[5] ATAG Aviation Benefits Beyond Borders 2024 report.

- **Air traffic management modernisation**: The modernisation of air traffic management, including the adoption of new technologies and procedures, is enhancing capacity, optimising routes, improving efficiency, and reducing delays. These advancements are already saving **millions of tonnes of CO_2.**The SESAR ATM Master Plan estimates that efficiencies from ATM modernisation could reach 200 million tonnes by 2040: close to 3 years' worth of total CO_2 emissions from aviation in Europe.

The Destination 2050 roadmap shows that the European civil aviation sector is on the right decarbonisation track but that meeting the 2050 goals will become increasingly challenging unless there is more European public support to make the industry's aspirational roadmap a reality.

Net-zero pathway for flights within and departing from the EU+ region



Total emission reduction per pillar by 2050

Pillar	Total Emission Reductions		Components	
Aircraft and Engine Technology	-27%	-79 MT CO_2	Recent Technology Future Technology Hydrogen Technology Demand reduction	12% 12% 2% 1%
ATM and Aircraft Operations	-6%	-19 MT CO_2	Airline operations Improvements in ATM Ground operations at airports	6% 6% 6%
Alternative Fuels and Sustainable Energy	-56%	-163 MT CO_2	Alternative Fuel SAF Alternative Fuel Hydrogen Demand reduction	35% 4% 2%
Economic Measures (EU ETS & CORSIA)	-12%	-35 MT CO_2	Economic Measures Demand reduction	10% 2%

Decarbonising the aviation sector requires substantial investment. The updated DESTINATION 2050 roadmap estimates total expenditures of **€2.4 trillion**; a 57% increase compared to the first edition in 2021. The majority of this increase stems from rising premium expenditures, which have grown from **€820 billion** to **€1.3 trillion** (+57%), driven largely by higher Sustainable Aviation Fuel (SAF) market price estimates. To meet these challenges, we must sustain and increase both private and public investment while fostering closer coordination and alignment among EU initiatives and Member States. This requires a regulatory framework that ensures market stability, provides long-term certainty, offers strong incentives for private investment within the EU, and establishes a global level playing field.

Making the Destination 2050 roadmap a reality requires a strong partnership between the European civil aviation sector and EU institutions based on **a permanent structured dialogue and strong support for the sector.**

Summary of Recommendations:

Actions (see Destination 2050 roadmap policy recommendations at www.destination2050.eu for more details) should include:

- **Doubling EU public funding for civil aviation research within the next MFF based on existing Clean Aviation and SESAR instruments (see earlier section on Research)**
- **Implementation of an EU industrial strategy for the development of Sustainable Aviation Fuels (SAFs) i.e. provide incentives for SAF production in Europe, extend & increase free ETS allowances for aviation, facilitate access for the use of biomass for aviation, implement a book & claim scheme, and support the Renewable and Low Carbon Fuels Alliance**
- **Preparing the European aviation ecosystem for hydrogen and electric aircraft i.e. support investment in infrastructure, integrated renewable electricity needs for civil aviation in European energy supply plans, derisk hydrogen production (contracts for difference) and strengthen the Alliance for Zero Emissions Aviation (AZEA)**

- **Support the modernisation and digitalisation of Air Traffic Management (ATM) led by the SESAR Joint Undertaking (see earlier section on ATM)**
- **Incentivise the uptake of Carbon Capture Utilisation (CCU) for aviation i.e. support investments in CCU research and technology, integrate negative emissions into ETS, derisk carbon removals (contracts for difference), SAF allowance benefits**
- **Work with ICAO on global solutions for global problems. Environmental diplomacy is critical to implementing global frameworks and roadmaps. Collaborative work with ICAO and other states is essential to assisting Member States in delivering the Long-Term Aspirational Goal (LTAG) for international aviation, strengthening CORSIA, and establishing an ambitious global SAF policy to tackle non-CO_2 emissions through international approaches.**

6. Simplification and Reduction of Regulatory Burden

ASD supports the EU Commission's initiative for simplification and reduction of regulatory burden. **Reducing EU overregulation is essential and urgent** for the competitiveness of EU industry.

Addressing the following elements is of crucial importance for the EU civil aeronautics industry.

6.1 Ensure a Level Playing Field

Address the heavier and more numerous compulsory sustainability requirements imposed on EU companies compared to their non-EU competitors.

Summary of Recommendations:

- **Acknowledge both quantitatively and qualitatively the regulatory due diligence and reporting gaps between EU and non-EU regulations, as well as inconsistencies among EU Member States.**
- **Establish strong EU/non-EU equivalence mechanisms to reduce the burden on companies (e.g. through an EU reference guide or soft law instrument).**
- **Develop EU ESG diplomacy (sustainability and climate) to speed up adoption in non-EU countries, through discussions in Free Trade Agreements and bilateral negotiations.**
- **Provide incentives/benefits for companies complying with EU rules without creating additional administrative burdens.**
- **Ensure the attractivity and efficiency of EU financial support for the Civil Aviation ecosystem through simplified instruments and rules free of new financial burden**

6.2 REACH, Chemicals, Eco-design for Sustainable Products Regulation (ESPR) and Taxonomy

Regulations like REACH and the Eco-design for Sustainable Products Regulation (ESPR) should take into consideration the aerospace industry's unique airworthiness and safety standards, long life-cycles and complex global supply chains.

ESPR

The Ecodesign for Sustainable Products Regulation (ESPR) seeks to establish broad sustainability requirements across various intermediate and final products. While the aerospace sector supports the EU's environmental goals, it emphasizes its unique characteristics that warrant special consideration. Aerospace accounts for a negligible share of raw material consumption, such as less than 0.1% of EU aluminium, and relies on highly specific alloys for safety. Civil aerospace products are already subject to stringent EASA airworthiness regulations, and overlapping ESPR requirements could lead to regulatory conflicts. Additionally, aircraft and their components have lifespans spanning several decades, making ESPR timelines for redesign and recertification unrealistic. The complexity of the aerospace supply chain, involving hundreds of thousands of parts, means that applying Digital Product Passport requirements would impose excessive administrative burdens, contrary to ESPR's goal of simplification.

Therefore, **the aerospace sector requests an explicit exemption from ESPR, including for intermediate products and supply-chain elements, consistent with the previous Eco-design Directive's exclusion of "means of transport**." This exemption is essential to avoid disproportionate burdens, regulatory conflicts, and unintended negative impacts on European competitiveness.

REACH

Consider the **need to simplify and reduce regulatory burden for downstream users** (such as civil aeronautics) in the **upcoming EU REACH Revision.** As recognised by the European Union Aviation Safety Agency (EASA) and the European Chemicals Agency (ECA), PFAS are essential to the aviation industry due to their unique properties.

Our sector is reliant on PFAS in a wide range of applications due to their unrivalled performance properties, making them the only choice currently available to meet the reliability demands required across the sector, especially for products operating for extended periods in harsh and extreme conditions of use. They are proven in A&D applications to be durable, stable and mechanically strong in harsh conditions, stable in air, water, sunlight, deep space vacuum, chemicals and microbes, chemically inert, non-wetting, non-stick, and highly resistant to temperature, fire, corrosive chemicals and weather. Impacted applications include metal plating, lubricants, fire suppression, hydrogen fuel cells, energy, electronics, electrical components and wires, coatings and paints, seals, sealants and adhesives, bearings and bushings, fuel and hydraulics systems and components in which PFAS can be present in manufacturing processes or purchased parts. PFAS are essential for the continued operability of products currently in service which may have a service life lasting more than 40 years as well as for the manufacture of new products, spare parts and future technology programmes.

REACH PFAS restrictions should consider aviation-specific needs, especially for fluoropolymers. In the vast majority of cases, **there are no suitable alternatives available**. Use of any non-certified possible PFAS free solution in an A&D application is not possible since it could result in a loss of performance and compromise product safety and reliability. Failure to address this will delay the deployment of the most efficient aircraft and, consequently, hinder the sector's ability to decarbonise.

It is also essential to **give aerospace Agencies (EASA, EDA, ESA) a bigger role** (and associated resources) to participate in European Chemicals Agency (ECHA) REACH related consultations **as sectoral authorities.**

Temporary use of hazardous materials: **Acknowledge that hazardous chemicals and materials may be temporarily necessary for reaching climate targets** by enabling key clean technologies until alternatives are developed. Align the EU taxonomy's Do No Significant Harm (DNSH) criteria with REACH exemptions and include Helicopter and Business Jet manufacturing in future revisions.

Summary of Recommendations:

- **Exempt the civil aeronautics industry from Eco-Design for Sustainable Products Regulation (ESPR), including for intermediate products and supply-chain elements, consistent with the previous Eco-design Directive's exclusion of "means of transport**
- **Simplify and reduce burden for downstream users of chemicals (such as the aerospace & defence sector) in the upcoming EU REACH Basic Legislation revision**
- **Ensure that the upcoming EU REACH PFAS restriction takes into account the specific needs of the aerospace & defence sector**
- **Give aerospace Agencies (EASA, ESA and EDA) a bigger role (and associated resources) to participate in European Chemicals Agency (ECHA) REACH related consultations as sectoral authorities.**
- **Align the EU taxonomy's Do No Significant Harm (DNSH) criteria with REACH exemptions**
- **Include helicopter and business jet manufacturing in future EU aviation taxonomy revisions.**

6.3 Reduce Reporting and Compliance Burden

Summary of Recommendations:

- **Conduct a review to identify and align common or overlapping data points between regulations, including SFRD, CSRD, CS3D, CBAM and Taxonomy. Aim to reduce significantly the number of required data points, for instance, through the Omnibus for Reporting proposal.**
- **Provide CBAM flexibility guidance to allow the use of default values in situations where collecting actual values is overly complex, especially for supply chain SMEs and mid-tier enterprises.**
- **Explore the creation of a secure EU data space (cloud) to centralise and re-use various reporting requirements at EU and national levels, reducing duplicated transmissions.**

6.4 Support the EASA simplification initiative

ASD supports the recently launched simplification initiative launched by the European Aviation Safety Agency through the Stakeholders Advisory Body (SAB).

EU Member States and the EU Commissions are encouraged to support the possible outcome of such an EASA initiative with the aim to reduce regulatory compliance costs without compromising aviation safety.

Summary of Recommendations:

- **Support EASA simplification initiative**

6.5 Strengthen the Sustainable Finance Framework

The ecosystems' decarbonisation path needs huge investments in technological, manufacturing, and human capital. A clear legal framework and a long-term industrial policy/plan are vital for ensuring stability and confidence over time. Support to R&D activities is a crucial enabler and requires the promotion of investments in capital goods and the creation of highly skilled jobs. Legislative instruments should be harmonised and made both clearer and more functional, with funding adopting an approach based on incentives and "nudges" rather than cumbersomeness.

Summary of Recommendations:

- **Strengthen the EU Sustainable Finance Framework: ensure the Framework supports companies in attracting private investments for transitional activities.**
- **Increased industry involvement in rulemaking processes, including representation on the Platform for Sustainable Finance.**
- **Focus more on incentivising investments in transitional activities, encouraging banks and investors to recognise these efforts as eligible for sustainable finance.**

6.6 Avoid EU overregulation in the field of Artificial Intelligence (AI)

EU overregulation in the field of Artificial Intelligence (AI) should be avoided since it could stifle innovation and as such undermine EU industry competitiveness. ASD supports the call made by several industry CEOs **to pause the implementation of the EU AI Act**. Planned new EASA rules in the field of AI should also be proportionate.

Summary of Recommendations:

- **Avoid overregulation in the field of AI and pause the EU AI Act**

7. Continue and strengthen international Cooperation (through ICAO and bilateral)

7.1 Global solutions through ICAO for global problems

The civil aviation market is truly global with European technology being exported to all parts of the globe. The International Civil Organization (ICAO) plays a key role to support the development of international civil aviation and deployment of European technology on the global market through the adoption of ICAO Standards & Recommended Practices (SARPs) and through further capacity building. European industry/ASD is actively involved through the International Coordination Council of Aerospace Industries Associations (ICCAIA).

It is **essential for the EU, European Civil Aviation Conference (ECAC) and its Member States to continue their efforts to ensure that ICAO work is in line with European and European industry**

needs. The EU Commission, EASA and European Member States should ensure that they continue to allocate human resources/budget for this important ICAO work.

In this context it is **also essential that ICAO itself is resourced to fulfil its mission**. The current situation where ICAO's budget has not been adapted for inflation since several years is not sustainable and will require a concerted effort by ICAO Member States to increase ICAO's funding. At the same time, **there is also a need to look at ICAO priorities and internal efficiency.**

Summary of Recommendations:

- **Continue efforts through EU, ECAC and European Member States to ensure that ICAO work is in line with European and European industry needs**
- **Ensure that ICAO is equipped to fulfil its mission**
- **Review ICAO priorities and internal efficiency**

7.2 Continue and strengthen bilateral cooperation

Continued bilateral cooperation is essential for the competitiveness of EU industry.

Further **strengthening EU-UK cooperation in the field of aviation safety & airworthiness through for example an extensive Bilateral Aviation Safety Agreement (BASA)**, could be beneficial for industry (both EU and UK) due to its close integration between EU and UK facilities.

In the field of airworthiness/safety, the **work on streamlined aircraft certification procedures and aviation safety with bilateral partners** (US FAA, Transport Canada, ANAC Brazil) through the Certification Management Team is benefiting industry through a reduction in duplicative oversight whereas it allows the Aviation Safety Authorities to deploy their resources in a more effective manner to ensure safety.

The EU and Japan share common interests and values. The European aerospace and defence industry is cooperating with the Japanese industry in different projects. Strengthen the EU-Japan cooperation in the field of aviation safety & airworthiness through leveraging the existing EU-Japan Bilateral Aviation Safety Agreement (BASA) and potentially expanding it to maintenance, repair and overhaul (MRO) should therefore also be a priority.

Continued funding for EASA technical cooperation projects in third countries as means to improve aviation safety while promoting European industry interests is also important (see earlier section on EASA). Emerging markets (such as in particular India) should be a priority for those projects.

Summary of Recommendations:

- **Further strengthen EU-UK cooperation in the field of aviation safety & airworthiness through a more comprehensive Bilateral Aviation Safety Agreement (BASA)**
- **Continue work with bilateral partners (US FAA, TCAA Canada and ANAC Brazil) on streamlined aircraft certification procedures and aviation safety**
- **Strengthen EU-Japan cooperation in the field of aviation safety & airworthiness. Consider expanding the existing EU-Japan BASA to MRO services.**
- **Continue funding for EASA technical cooperation projects in third countries and prioritise projects on key emerging markets (such as i.e. India)**

8. Address the growing skill challenge

Europe's civil aeronautics sector is grappling with a mounting skills challenge driven by a wave of retirements, evolving technological requirements, and intense competition for talent with other high-tech industries. Despite hiring booms—GIFAS forecasts 35,000 new recruits in France alone in 2024— the industry still faces vacancy rates of up to 20% in key roles such as engineers, technicians, and digital specialists across Europe.

Research by McKinsey & Company warns that mismatches between talent supply and demand could cost individual firms up to €300 million in missed opportunities, underlining the economic stakes of closing this gap.

Scale and Scope of the Skills Challenge

High Vacancy Rates: Aerospace SMEs and large OEMs reported job vacancy rates of 20%, well above the national average of 13%, reflecting acute shortages in engineers, technicians, and production staff. GIFAS projects 50,000 positions to fill in production, engineering, maintenance, and management roles in 2024 alone, highlighting sustained recruitment pressure.

Retirements and Demographic Shifts: In Europe, 27% of current aircraft engineers are due to retire within the next decade, exacerbating the gap between outgoing expertise and incoming graduates. With 25,000–30,000 hires expected this year—including 7,000 apprentices—the sector must replenish an ageing workforce while competing with tech industries for digital talent

Root Causes and Drivers

Technological Evolution: Next-generation aircraft, sustainable fuels, and avionics digitization are creating demand for niche profiles—AI specialists, systems-integration engineers, and hydrogen-fuel experts—stretching the limits of traditional training programs.

Perception and Attractiveness:

Aerospace struggles with an image problem: young graduates perceive it as 'difficult and demanding,' preferring sectors like IT or finance. SMEs, in particular, lose out against household names (Airbus, Safran) in attracting talent, despite offering compelling career paths in sustainability and innovation.

Fragmentation of Training Ecosystem:

While initiatives like PEGASUS link 30 universities across 12 countries to standardize aeronautics curricula, gaps remain in continuous reskilling and cross-border credential recognition—issues worsened by post-Brexit licensing barriers for UK-trained engineers.

Consequences for Competitiveness

Economic Risks: McKinsey & Company estimates a medium-sized aerospace company could forego €330 million in revenue by failing to recruit the right staff—underscoring how talent shortages directly undermine growth opportunities.

Innovation Bottlenecks:

Delayed projects in Clean Aviation and SESAR programs risk slowing Europe's decarbonisation roadmap. Without sufficient digital-systems and sustainable-fuel expertise, Europe risks ceding leadership to the US and emerging economies in next-gen aerospace technologies.

Industry and Policy Responses

Corporate Learning Organizations: Thales has adopted a 'learning organisation' model, embedding mentorship and rotational programs to transfer senior engineers' know-how to juniors, while Safran piloted hiring 50 senior engineers in 2023 to bridge experience gaps despite higher salary costs.

EU Skills Union and National Initiatives:

The European Commission's Skills Union aims to boost lifelong learning, facilitate worker mobility, and attract third-country talent through 'Choose Europe' visas and Erasmus+ expansions — measures critical to filling deficits across member states.

Academic–Industry Partnerships:

Workshops like ICAO's EUR/NAT Training and Skills forum (March 2025) bring regulators, academia, and industry together to design regional skills-monitoring frameworks and align curricula with emerging needs in autonomy, AI, and AAM (Advanced Air Mobility).

Recommendations for Closing the Gap

Tackling Europe's aeronautics skills challenge **requires collective, sustained efforts**—leveraging policy frameworks, industry initiatives, and educational partnerships—to ensure the sector remains at the forefront of innovation, sustainability, and global competitiveness.

The nature of the skills challenge is such that it is **best addressed at regional level (close to where education takes place and where factories are based) but Europe can play an important role to provide funding for such initiatives, exchange best practices, create trans-national networks and remove regulatory barriers.**

Summary of Recommendations:

- **Provide EU funding for local skills initiatives**
- **Integrated Reskilling Roadmaps: Adopt the '360° Reskilling and Upskilling' model, coordinating universities, vocational schools, and employers to deliver modular certifications in digital and green aviation technologies.**
- **Promotion and Outreach: Launch 'Aviation Ambassadors' programs in high schools, leveraging social media platforms (e.g., TikTok) to showcase aerospace careers' innovation and sustainability angles**
- **Incentives for SMEs: Provide tax credits or co-funded apprenticeships to help SMEs compete with major OEMs for talent and invest in on-the-job training infrastructures.**

- **Cross-Border Credential Harmonization: Work through EASA and national authorities to streamline license recognition, especially between the EU and post-Brexit UK, to maximize talent pool mobility (see also earlier section on bilateral cooperation).**
- **Diversity and Inclusion: Act on WIA-Europe's call to boost female representation beyond the current 20%, and to welcome non-STEM entrants through tailored conversion courses, thereby broadening the talent pipeline.**

9. Leverage the EU institutions, European Agencies, EU Member States and other ECAC Member States working as a 'Team Europe' to make this industrial strategy a reality

Making this vision a reality will require strong coordination among the EU institutions, European Agencies (EASA, Eurocontrol, SESAR-JU, Clean Aviation-JU), EU and other non-EU ECAC Member States in close cooperation with the European aeronautical industry where **all work together as a 'Team Europe'** both within Europe as well as at global level.

In order to take stock of relevant recommendations & progress, **a permanent high-level structured dialogue should be set up between the EU/ECAC and European civil aeronautics industry/civil aviation sector**.

Such a structured dialogue could be modelled on the recently launched ICAO Industry Consultation Forum (ICF).

It is in particular **essential for the EU, European Civil Aviation Conference (ECAC) and its 44 Member States to continue their efforts to ensure that ICAO work is in line with European and European industry needs**

Summary of Recommendations:

- **Create a permanent high-level structured dialogue between the EU/ECAC and European civil aeronautics industry/civil aviation sector**

Annex

Detailed list of recommendations:

1. Acknowledging aeronautics as a strategic sector for the EU

- *We recommend European politicians to focus efforts on working with the civil aviation and aeronautics sector on providing support for concrete measures to tackle its decarbonization challenges while recognizing the need for the European civil aviation & aeronautics sector to stay competitive globally.*

2. Accelerate innovation and double the EU public funding for civil aviation research

- *We recommend a ring-fenced civil aviation research budget of at least 6 billion Euro in the next MFF*
- *We recommend allocating at least 20-25% of the future ETS innovation fund for civil aviation decarbonization efforts*
- *We recommend keeping the upcoming Framework Programme 10 (FP10) as a simple tool with long term funding stability based on existing proven instruments Clean Aviation, SESAR and collaborative research*

3. Strengthen the industrial component of civil aeronautics

Securing Critical Raw Materials for Civil Aeronautics

- *Support local mining & processing facilities to increase strategic autonomy*
- *Recognize the entire aerospace and defence eco-system as a priority sector for critical raw material access;*
- *Give priority in the EU CRM Act for projects related to the supply of the aerospace and defence sector and, if relevant, consider potential joint purchasing through the upcoming EU Centre for raw materials and conditioning EU funding on maintaining the supply for the sector;*
- *Identify and support secondary raw material sources (recycling) and permanents magnets recycling synergies with other industrial sector (automotive for instance);*
- *Secure supply through the acceleration of the negotiation or the implementation of existing trade cooperation agreements with "like-minded" partners (e.g. EU-Canada on Cobalt, EU-Japan on Titanium, EU-Australia for Rare Earth Elements (REE), EU-Africa for basic raw materials mining etc);*
- *Create fast-track EU projects for Rare Earth Elements (REE) separation, Samarium (Sm) and Yttrium (Y) oxides, and magnet metallization (including aerospace-grade SmCo (Samarium Cobalt) within the single market, and include targeted OPEX support until scale is reached;*
- *Establish EU-backed strategic stockpiles for critical oxides and alloys (Sm, Y, Ta, W) dedicated to aerospace safety-critical uses, with transparent draw-down rules;*

- *Enable long-term offtake contracts (with EU/Member states guarantees) to underwrite new non-China capacity in the EU and allied countries (Australia/Canada/EEA/UK, etc)*
- *Create a new aerospace and defence dedicated cluster in the European Raw Materials Alliance (ERMA) in consultation with EIT Raw Materials managed by the European Institute for Innovation and Technology (EIT)*

Tackling the uncompetitive European energy costs

- *Develop and implement together with the European Member States a different European Energy Strategy which balances decarbonization with competitiveness and which is technology neutral. Lowering European energy cost is key for the wider industrial ecosystem's competitiveness*

Work on advanced materials and processes

- *Allocation of available EU funding to dedicated civil aeronautics projects related to advanced materials and processes.*
- *Ensure more risk-based EASA rules for additive manufacturing procedures to enable a quicker adoption of new processes while guaranteeing safety.*
- *Funding of shared testing infrastructures and shared data infrastructures.*
- *Funding of innovative processes and infrastructures for treatment of scraps aimed to the relevant reuse.*
- *Promotion and funding of innovative logistics based on collection and distribution centers for scraps transformation*
- *Promotion and development of additive manufacturing for use in civil aeronautics: developing a truly skilled value chain from small and medium-sized complex components to large simple com ponents.*
- *Support to material circularity: specific policies for technical validation, e.g., certification criteria of refurbished-reused-recycled materials and components and where available EU funding for research. At the same time overregulation and additional red tape in the field of circularity should be avoided.*

Secure critical components (i.a. semiconductors, batteries, permanent magnets)

Semiconductors

- *The civil aeronautics sector, along with Defence and Space needs, should be addressed in the forthcoming review of the EU Chips Act*
- *The EU should develop a joint strategy with allied nations (UK, Japan, South-Korea, Canada, Taiwan and if possible, the USA) to ensure supply for European aerospace and defence industry. Such a strategy should balance the need for strategic autonomy with cost effective-ness (doing everything in Europe might not be efficient).*
- *Europe should also leverage its leadership on EUV lithography machines, to protect supply of semiconductors to European industry and European interests and to avoid single dependen-cies.*

- *The EU should support the constitution of buffer inventories for safety-critical integrated circuits and analog/power devices, and co-fund multi-year framework agreements to stabilize pricing and lead-times.*
- *EU manufacturers should be encouraged to maintain production lines for the aerospace and defence sector as a precondition for accessing EU funds.*

Batteries

- *Develop a production chain for batteries for aviation including production means.*
- *Develop strategic partnership with raw materials suppliers to enable sovereign batteries production in Europe, including for the aeronautics sector.*
- *Address the specific needs of aeronautics in terms of safety and certifications rules along the overall Battery System Value Chain (From cells to Systems).*
- *Identify and support use of secondary raw material sources through recovery and recycling.*
- *Provide CAPEX + OPEX bridges and offtake guarantees for EU magnet value chains serving aviation (including Sm/Y oxides, metallization).*
- *Create a cluster dedicated to aeronautics within the European Battery Alliance (EBA) in close cooperation with EIT InnoEnergy to finally address the specific needs of the aeronautical sector.*

Permanent Magnets for global aviation:

- *Develop a production chain for permanent magnets for aeronautics including production means from rare earth ore extraction to magnets production.*
- *Develop strategic partnership with REO Materials Suppliers to enable sovereign Supply Chain.*
- *Address the specific needs of aeronautics in terms of quality and grains.*
- *Identify and support secondary raw material sources (recycling) and permanents magnets recycling synergies with other industrial sectors (automotive for instance) but also with "like-minded" interested countries (Japan).*
- *Fund design-to-reduce Rare Earth Elements (REE) R&D while keeping Samarium-Cobalt (SmCo) available for harsh environments where substitutions are not yet available*

Support industrial decarbonization

- *Allocate a share of available renewable/low carbon energy sources for the decarbonization of the civil aeronautical industry's own production*

Support digital transformation of industry

- *Provide EU financial support to key industrial digital transformation projects and cybersecurity capabilities*
- *Establish an EU-wide certification scheme for sovereign cloud services (based on EUCS High+),*
- *Provide within the EU AI Action Plan dedicated financial support for key Artificial Intelligence initiatives for aerospace & defence,*

- *Avoid overregulation in the field of Artificial Intelligence (AI) and pause the EU AI Act,*
- *Ensure more harmonized and simplified cyber regulations and reporting, by relying more on regulations and less on directives, aligning sectorial (e.g., EASA Part-IS) and horizontal (e.g., NIS2) regulations and certifications. Ensure that rules are also practical for application by SMEs.*
- *Leveraging Non-Legislative Tools by harmonizing cybersecurity funding mechanisms across programs*
- *Harness investment to allow the emergence of leading EU cybersecurity and AI players*
- *Support digital transformation roadmap through change management and training initiatives*

Ensure that the European Aviation Safety Agency (EASA) is equipped to certify European technology on time

- *Protect EASA's public budget from funding cuts in the next EU MFF*
- *Make further improvements to EASA internal procedures & efficiency*
- *Support the EASA Simplification Initiative.*
- *Continue to provide within the next MFF, funding for EASA technical cooperation projects in third countries*

4. Support the modernisation and digitalisation of Air Traffic Management (ATM)

- *Keep existing SESAR Joint Undertaking and SESAR Deployment instruments as essential tools for modernizing the European skies and ensuring the continued global leadership of the European ATM technology industry*
- *Provide at least 700mEuro funding in the next EU MFF to continue SESAR research*
- *Provide at least 3 billion Euro funding in the next EU MFF to support SESAR deployment*
- *Implement a smart and supportive regulatory framework that incentivizes early movers of new technology and to avoid fragmentation*

5. Support civil aviation decarbonization

Actions (see Destination 2050 roadmap policy recommendations at www.destination2050.eu for more details) should include:

- *Doubling EU public funding for civil aviation research within the next MFF based on existing Clean Aviation and SESAR instruments (see earlier section on Research)*
- *Implementation of an EU industrial strategy for the development of Sustainable Aviation Fuels (SAFs) i.e. provide incentives for SAF production in Europe, extend & increase free ETS allowances for aviation, facilitate access for the use of biomass for aviation, implement a book & claim scheme, support the Renewable and Low Carbon Fuels Alliance*
- *Preparing the European aviation ecosystem for hydrogen and electric aircraft i.e. support*

investment in infrastructure, integrated renewable electricity needs for civil aviation in European energy supply plans, derisk hydrogen production (contracts for difference) and strengthen the Alliance for Zero Emissions Aviation (AZEA)

- *Support the modernisation and digitalisation of Air Traffic Management (ATM) led by the SESAR Joint Undertaking (see earlier section on ATM)*
- *Incentivise the uptake of Carbon Capture Utilisation (CCU) for aviation i.e. support investments in CCU research and technology, integrate negative emissions into ETS, derisk carbon removals (contracts for difference), SAF allowance benefits*
- *Work with ICAO on global solutions for global problems. Environmental diplomacy is critical to implementing global frameworks and roadmaps. Collaborative work with ICAO and other states is essential to assisting Member States in delivering the Long-Term Aspirational Goal (LTAG) for international aviation, strengthening CORSIA, and establishing an ambitious global SAF policy to tackle non-CO_2 emissions through international approaches*

6. Simplification and reduction of regulatory burden

Ensure a level playing field

- *Acknowledge both quantitatively and qualitatively the regulatory due diligence and reporting gaps between EU and non-EU regulations, as well as inconsistencies among EU Member States.*
- *Establish strong EU/non-EU equivalence mechanisms to reduce the burden on companies (e.g. through an EU reference guide or soft law instrument).*
- *Develop EU ESG diplomacy (sustainability and climate) to speed up adoption in non-EU countries, through discussions in Free Trade Agreements and bilateral negotiations.*
- *Provide incentives/benefits for companies complying with EU rules without creating additional administrative burdens*
- *Ensure the attractivity and efficiency of EU financial support for the Civil Aviation ecosystem through simplified instruments and rules free of new financial burden*

REACH, Chemicals, Eco-design for Sustainable Products Regulation (ESPR) and Taxonomy

- *Exempt the civil aeronautics industry from Eco-Design for Sustainable Products Regulation (ESPR), including for intermediate products and supply-chain elements, consistent with the previous Eco-design Directive's exclusion of "means of transport*
- *Simplify and reduce burden for downstream users of chemicals (such as the aerospace & defence sector) in the upcoming EU REACH Basic Legislation revision*
- *Ensure that the upcoming EU REACH PFAS restriction takes into account the specific needs of the aerospace & defence sector*
- *Give aerospace Agencies (EASA, ESA and EDA) a bigger role (and associated resources) to participate in European Chemicals Agency (ECHA) REACH related consultations as sectoral authorities.*

- *Align the EU taxonomy's Do No Significant Harm (DNSH) criteria with REACH exemptions*
- *Include helicopter and business jet manufacturing in future EU aviation taxonomy revisions.*

Reduce Reporting and Compliance Burden

- *Conduct a review to identify and align common or overlapping data points between regulations, including SFRD, CSRD, CS3D, CBAM and Taxonomy. Aim to reduce significantly the number of required data points, for instance, through the Omnibus for Reporting proposal.*
- *Provide CBAM flexibility guidance to allow the use of default values in situations where collecting actual values is overly complex, especially for supply chain SMEs and mid-tier enterprises.*
- *Explore the creation of a secure EU data space (cloud) to centralise and re-use various reporting requirements at EU and national levels, reducing duplicated transmissions***.**

European Aviation Safety Agency (EASA)

- *Support the EASA simplification initiative*

Strengthen the Sustainable Finance Framework

- *Strengthen the EU Sustainable Finance Framework: ensure the Framework supports companies in attracting private investments for transitional activities.*
- *Increased industry involvement in rulemaking processes, including representation on the Platform for Sustainable Finance.*
- *Focus more on incentivising investments in transitional activities, encouraging banks and investors to recognise these efforts as eligible for sustainable finance.*

Avoid overregulation in the field of Artificial Intelligence

- *Avoid overregulation in the field of AI and pause the EU AI Act*

7. Continue and strengthen international cooperation

Global cooperation through ICAO for global solutions

- *Continue efforts through EU, ECAC and European Member States to ensure that ICAO work is in line with European and European industry needs*
- *Ensure that ICAO is equipped to fulfil its mission*
- *Review ICAO priorities and internal efficiency*

Continue and strengthen bilateral cooperation

- *Further strengthen EU-UK cooperation in the field of aviation safety & airworthiness through a more comprehensive Bilateral Aviation Safety Agreement (BASA)*

- *Continue work with bilateral partners (US FAA, TCAA Canada and ANAC Brazil) on streamlined aircraft certification procedures and aviation safety*
- *Further strengthen EU-UK cooperation in the field of aviation safety & airworthiness through a more comprehensive Bilateral Aviation Safety Agreement (BASA)*
- *Strengthen EU-Japan cooperation in the field of aviation safety & airworthiness. Consider expanding the existing EU-Japan BASA to MRO services.*
- *Continue funding for EASA technical cooperation projects in third countries and prioritise projects on key emerging markets (such as i.e. India)*

8. Address the growing skills challenge

- *Provide EU funding for local skills initiatives*
- *Integrated Reskilling Roadmaps: Adopt the '360° Reskilling and Upskilling' model, coordinating universities, vocational schools, and employers to deliver modular certifications in digital and green aviation technologies.*
- *Promotion and Outreach: Launch 'Aviation Ambassadors' programs in high schools, leveraging social media platforms (e.g., TikTok) to showcase aerospace careers' innovation and sustainability angles*
- *Incentives for SMEs: Provide tax credits or co-funded apprenticeships to help SMEs compete with major OEMs for talent and invest in on-the-job training infrastructures.*
- *Cross-Border Credential Harmonization: Work through EASA and national authorities to streamline license recognition, especially between the EU and post-Brexit UK, to maximize talent pool mobility (see also earlier section on bilateral cooperation).*
- *Diversity and Inclusion: Act on WIA-Europe's call to boost female representation beyond the current 20%, and to welcome non-STEM entrants through tailored conversion courses, thereby broadening the talent pipeline.*
- *Promote sustainability: Support Environmental, Social and Governance (ESG) sustainability roadmap and compliance with Corporate Reporting Sustainability Directive (CRSD).*
- *Promote sustainability based on Environmental, Social and Governance (ESG) criteria*

9. Leverage the EU institutions, European Agencies, EU Member States and other ECAC Member States working as a 'Team Europe' to make this industrial strategy a reality

- *Create a permanent high-level structured dialogue between the EU/ECAC and European civil aeronautics industry/civil aviation sector*

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