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ESA Skills Digital Twin Initiative:

Understanding current and future skills and competencies needs in the European space ecosystem

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FOREWORD BY JOSEF ASCHBACHER

"An agency is only as strong as its people. At a time when the European space sector is expanding and accelerating, and ESA is experiencing very dynamic and successful years, our ability to deliver on our ambitions depends on attracting the best people from diverse backgrounds and with a wide range of skills. This timely analysis is therefore an essential contribution to supporting Europe's future in space."

Josef Aschbacher
Director General,
European Space Agency

FOREWORD BY VALERIO DE MOLLI

Europe is entering a decisive phase for its strategic autonomy, competitiveness, and long-term resilience. In an increasingly complex geopolitical environment, space has evolved from a primarily scientific domain into a critical infrastructure underpinning security, economic competitiveness, technological sovereignty, and societal resilience. Satellite systems, Earth observation, navigation, connectivity, and data-driven services now constitute essential enablers for public institutions, businesses, and citizens alike.

In this context, the strength of the European space ecosystem will depend not only on technological excellence and industrial capacity, but increasingly on the **availability, adaptability, and quality of human capital**. As space systems grow more software-defined, data-intensive, and interconnected with adjacent sectors such as defence and telecommunications, the mismatch between current workforce capabilities and future needs risks becoming a binding limitation to growth and competitiveness.

This Strategic Report, launched by the European Space Agency (ESA) and developed by TEHA Group, provides a timely and evidence-based contribution to this challenge. It introduces a novel and forward-looking approach to understanding skills dynamics in the European space ecosystem through the development of a **Skills Digital Twin**: a dynamic, data-driven representation of current and emerging skills demand, talent circulation patterns, and structural gaps across the sector. At the core of this work are two proprietary databases developed specifically for the study, bringing together a unique evidence base of **8,961 job postings and more than 13,764 aerospace engineer profiles.**

The analysis goes beyond traditional workforce statistics. By integrating large-scale data on job postings and professional profiles through a proprietary AI-based tool, combined with qualitative insights gathered from stakeholders across the ecosystem, this study offers a multidimensional view of how roles, competencies, and career trajectories are evolving. It highlights the growing importance of transversal skills, digital and AI capabilities, and T-shaped profiles that combine deep technical expertise with adaptability, systems thinking, and cross-functional collaboration. At the same time, it sheds light on critical challenges, including workforce conversion, talent concentration and competition from adjacent sectors that increasingly attract aerospace-trained professionals.

One of the key messages emerging from this work is clear: workforce growth alone will not be sufficient to secure Europe's leadership in space. Without a parallel effort to enhance productivity, accelerate skills development, and improve talent retention, the sector risks expanding headcount without strengthening its competitive position. Addressing this challenge requires a coordinated, long-term strategy that spans the entire skills lifecycle, from early STEM activation and education pathways, to continuous upskilling and reskilling. In this perspective, ESA can play a unique and pivotal role. As the anchor institution of the European space ecosystem, ESA is well positioned to play a role in encouraging greater alignment and coordination among Member States, industry, academia, and training providers. This report is intended as a first contribution to broader reflection. It aims to support strategic discussions, inform policy thinking, and build a shared understanding among stakeholders of the urgency and scale of the skills challenge ahead. Ultimately, investing in people, alongside technology and infrastructure, is the most durable way to ensure that Europe remains a leading, sovereign, and innovative space power in the decades to come.

Such an ambitious challenge was made possible in part by the Scientific Advisor, **Alice Bunn** (Former International Director, UK Space Agency), who accompanied us on this journey and to whom I would like to express my thanks.

Before leaving you to read the report, I would like to express my gratitude to the partner of this initiative, the European Space Agency, and to its management team, made up of **Marco Ferrazzani** (Director of Resources and Services, ESA), **Ildikó Szőke** (Head of Human Resources, ESA) and **Ersilia Vaudo** (Special Advisor on Future Talent, ESA).

Lastly, I would like to conclude my foreword by thanking the TEHA working group that worked on this initiative, led by Corrado Panzeri and composed of Matteo Polistina, Filippo Minisini, Stella Chen, Umberto Mille, Arianna Basso, and Roberta Braccio.

Valerio De Molli

Managing Partner & CEO, The European House – Ambrosetti and TEHA Group

Executive Summary

EXECUTIVE SUMMARY

Space is no longer solely a domain of scientific ambition; it has become a critical strategic infrastructure underpinning European sovereignty, security, and economic competitiveness. Over the past decade, the sector has also experienced significant employment growth, expanding at an annual rate of around 5% and reaching 66.1k FTEs (*full time equivalent*) in 2024. If the pace observed since 2020 is sustained, the workforce is projected to reach 104k FTEs by 2030: marking a 70% increase in a very short period of time.

However, this growth trajectory is unfolding against a backdrop of increasing structural pressures, including demographic winter, the rapid pace of technological change and intensifying competition for talents from adjacent industries. In this context, ensuring that these new entrants, as well as the current workforce, possess the right skills will be essential to closing capability gaps, improving productivity, and supporting Europe's strategic ambitions.

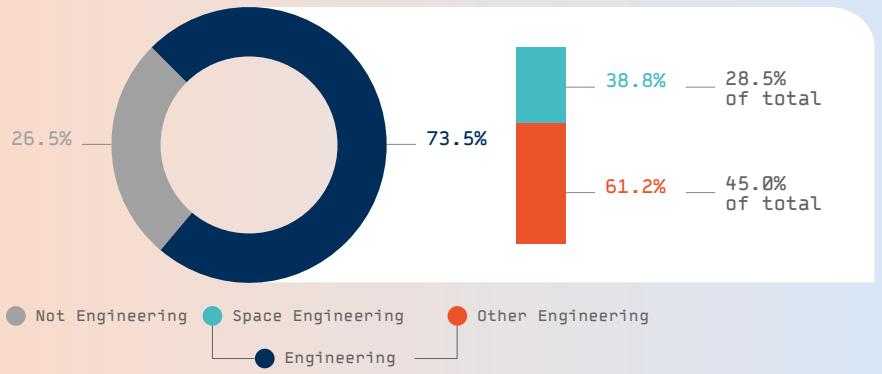
This study, launched by the European Space Agency (ESA) and developed by TEHA Group, provides an evidence-based analysis of the European space workforce, its dynamics, and its future evolution. To this end, the study developed a proprietary AI-driven analytical framework that integrates web scraping and Natural Language Processing to construct a Skills Digital Twin of the European aerospace labour market. This framework enables a granular, forward-looking mapping of skills demand, talent mobility, and workforce dynamics across the ecosystem. By leveraging this unique system, the study generated two original datasets. The first covers **8,961 LinkedIn job postings** published between December 2025 and March 2026 by 50 European space organisations spanning large enterprises, SMEs, and startups. The second reconstructs the career trajectories of **13,764 aerospace engineering graduates** from 28 leading European universities.

The quantitative analysis was further enriched by qualitative insights gathered through extensive stakeholder engagement activities, including a working table, confidential one-to-one interviews, and a survey, gathering perspectives of around **65 sector stakeholders**. Taken together, this combined evidence base provides valuable insights of direct strategic relevance for policymakers, industry leaders, and ESA, thereby supporting more coordinated and effective talent strategies at the European level.

EXECUTIVE SUMMARY

The job postings analysis reveals a highly concentrated labour market, with 84% of demand from just 6 European countries and 65% generated by 5 companies. In terms of educational background, demand is heavily engineering-driven, with 73.5% of job postings seeking engineering profiles (**Figure 1**). Yet only 38.8% of this demand is for aerospace engineering profiles, while the majority is directed toward other engineering backgrounds, particularly software, quality, and mechanical engineering. Notably, demand is also growing for emerging profiles related to advanced digital technologies, such as AI systems engineering, flight software engineering, cybersecurity, signalling a gradual shift toward software-defined, data-intensive, and autonomous space systems.

Figure 1. **Job posts distribution by type of educational background (% values), 15/12/25 – 30/03/26.**

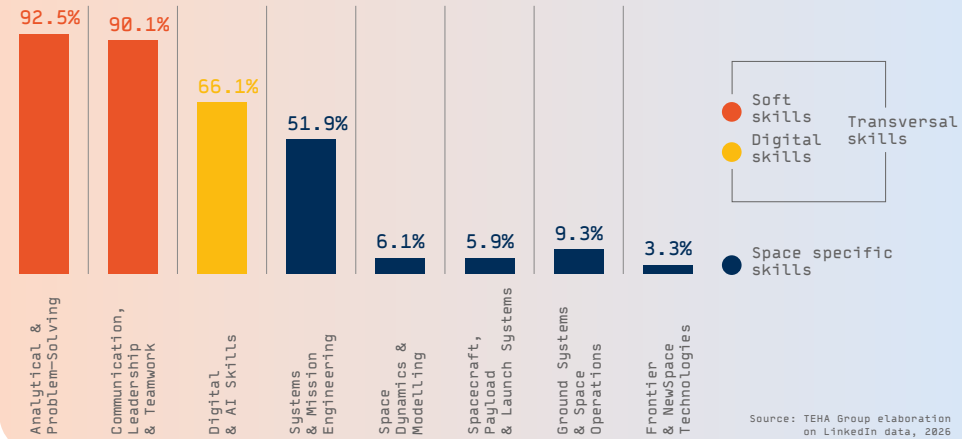


Source: TEHA Group elaboration on LinkedIn data, 2026

EXECUTIVE SUMMARY

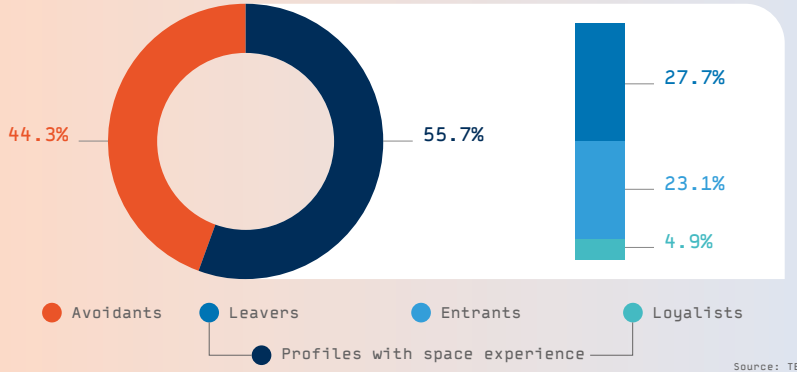
A key contribution of this analysis lies in the detailed examination of skill requirements, an area often underrepresented in existing literature. The findings show that transversal competencies are nearly universally demanded, with analytical and problem-solving skills required in 92.5% of postings and communication and teamwork in 90.1% (**Figure 2**). **Also, digital and AI-related skills are mission critical**, appearing in 66.1% of vacancies, with Python as the most frequently cited technical skill. Overall, the evidence indicates that space employers are looking for T-shaped professionals, capable of combining deep technical expertise with transversal and digital capabilities.

Figure 2. **Skills clusters demanded in job posts (% values, excluding N/A), 15/12/25 – 30/03/26.**



The career trajectory analysis highlights what may be the sector's most critical structural challenge. Of the 13,764 aerospace engineering graduates in the sample, only 28% are currently employed within the aerospace domain. Reconstruction of career paths indicates that long-term sectoral retention is limited, with just 4.9% of graduates spending their entire careers in space (loyalists), while 44.3% never enter the sector at all (avoidants) (**Figure 3**). More frequently, career patterns are characterized by circulation: 27.7% of aerospace engineers initially enter the space sector and later exit (leavers), while a comparable share, 23.1%, begin in other sectors before transitioning into space (entrants).

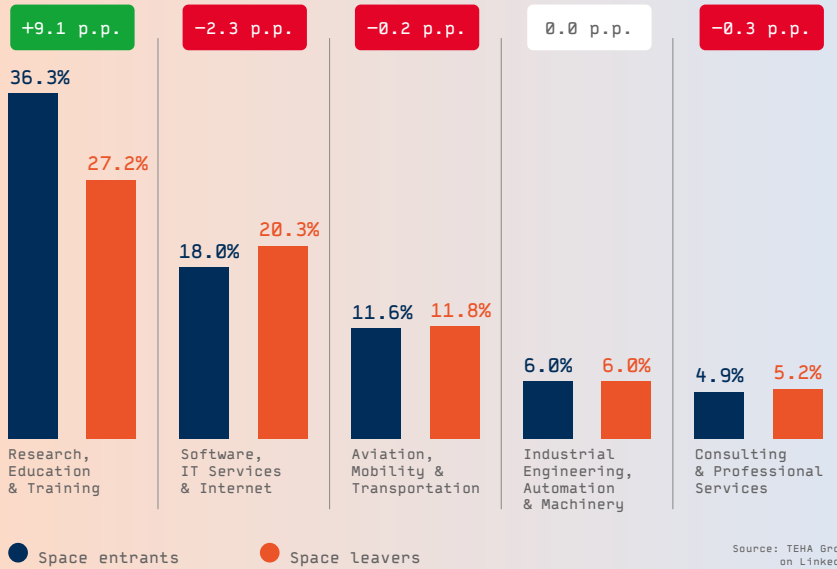
Figure 3. **Space industry participation (% values), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

The five industries through which talent most frequently moves bidirectionally are research and academia, software and IT, mobility, industrial engineering, and consulting (**Figure 4**). The balance between inflows and outflows indicates not a poaching dynamic, but a broader structural condition: aerospace skills are highly transferable and consistently demanded across knowledge-intensive sectors. Within this landscape, academia stands out as the only net source of talent inflows. The strong permeability between academia and the space sector suggests that, rather than being a competitor, academia should be regarded as a strategic partner.

Figure 4. **Top 5 industry clusters aerospace profiles moved in and out (% values), 2026.**

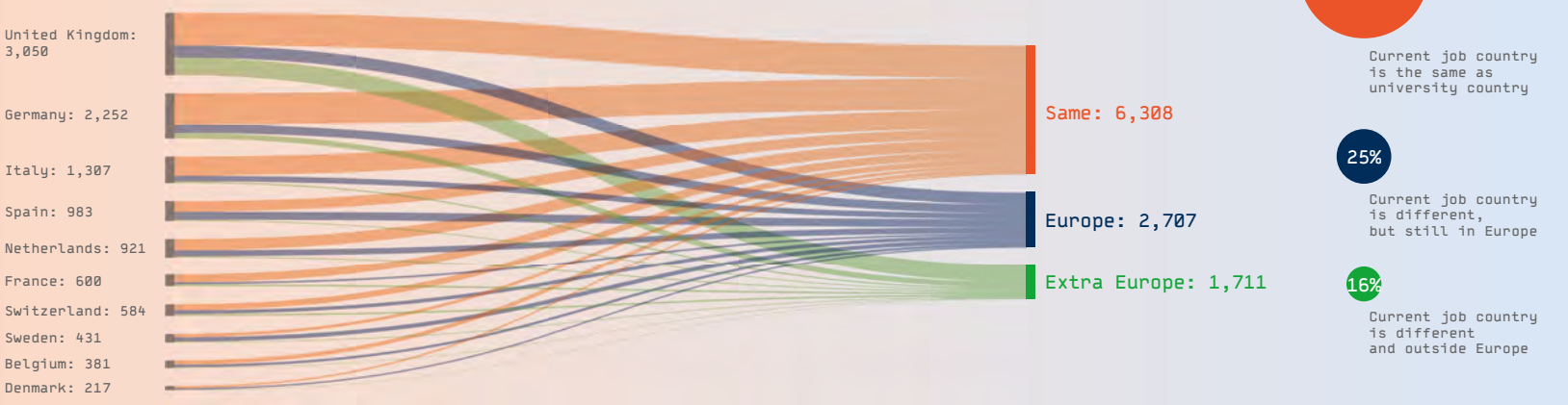


Source: TEHA Group elaboration on LinkedIn data, 2026.

EXECUTIVE SUMMARY

Beyond talent circulation across industries, geographical mobility also emerges as significant in the European aerospace sector. Overall, 41% of aerospace engineering graduates are currently working in a different country from that in which they studied. In particular, 25% remain within Europe, while 16% move outside the continent (**Figure 5**), with the United States representing the primary extra-European destination.

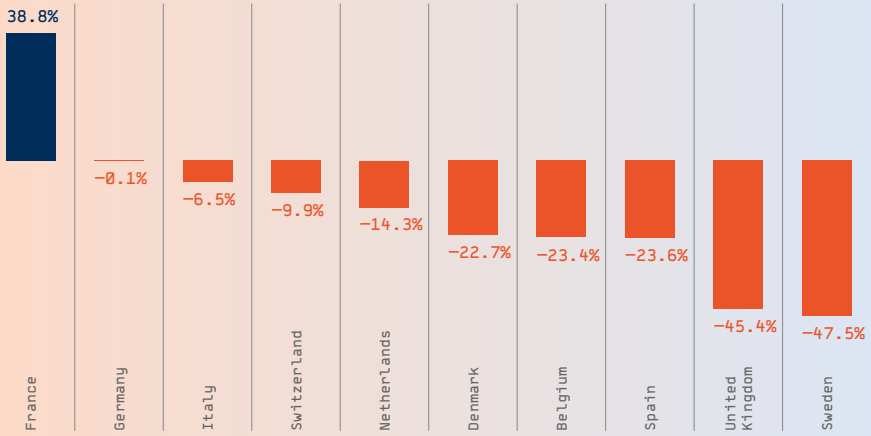
Figure 5. **Flows from university country to current job country (absolute values), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

Looking more closely at intra-European mobility, France is the only European country recording a net gain in talent flows within Europe, while all other countries act as net exporters of space talent (**Figure 6**). This pattern may be partly explained by the concentration of major industry leaders in France, which strengthens its capacity to attract and retain space talent from across the continent.

Figure 6. **Delta distribution of aerospace engineers, training location vs working location (% value), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

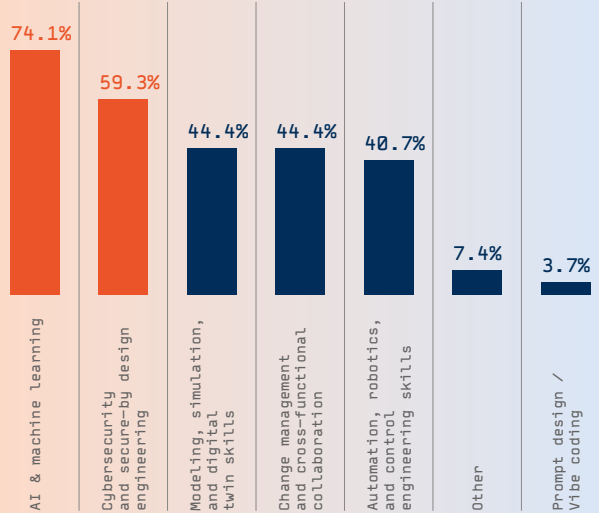
EXECUTIVE SUMMARY

Findings from the survey of professionals within the European space ecosystem show that artificial intelligence and machine learning are regarded as the most critical to maintain competitiveness by 2030, cited by 74.1% of respondents, followed by cybersecurity and secure-by-design engineering at 59.3% (**Figure 7**). This confirms the evidence from the job market demand analysis, highlighting the growing importance of digital and AI skills.

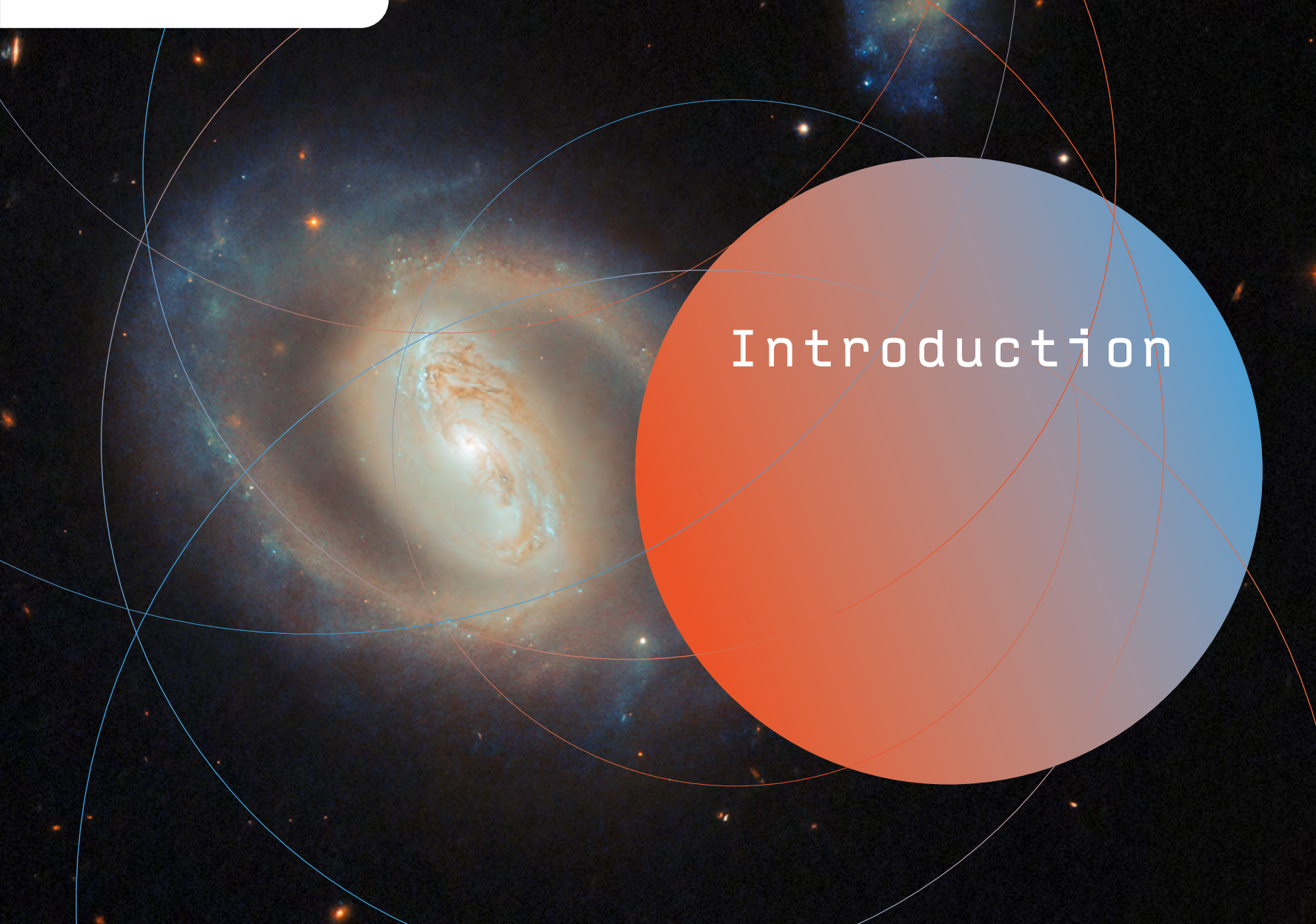
At the same time, the sector's organisational readiness to build and deploy these capabilities remains structurally limited. Skill fragmentation, with talent siloed across functions and organisations, is identified as the primary barrier to technology adoption by 51.9% of respondents, followed by legacy mindsets (44.4%) and infrastructure limitations (40.7%). Overall, survey findings indicate that the sector is aware of the capabilities required but has not yet established the conditions to develop them at scale.

In light of these findings, the study underscores the strategic importance of an integrated talent agenda for the European space ecosystem, to strengthen attraction, retention and workforce transformation in order to equip both current and future employees with the skills needed to respond to rapid technological change and sustain Europe's competitiveness. In this context, skills and talent initiatives, particularly in upskilling, reskilling and retention, should be seen as core enablers of Europe's long-term ambition and strategic positioning in space.

Figure 7. **Skills needed to integrate and capitalise new technologies and remain competitive by 2030 (% of respondents), 2026.**



Source: TEHA Group elaboration on Survey data, 2026



Introduction

This strategic report collects and synthesizes the findings of the initiative "**ESA Skills Digital Twin Initiative**: Understanding current and future skills and competencies needs in the European space ecosystem" launched by the European Space Agency (ESA) and carried out by TEHA Group.

The project aims to develop a dynamic Digital Twin of skills across the European space ecosystem, to provide a clearer understanding of the workforce's preparedness for future skills, mapping current needs in the space ecosystem, as well as identifying emerging and critical skills gaps.

This work was carried out to support a reflection launched by ESA on the future of talent in the European space sector. The analysis served as the foundation for an in-depth discussion held on April 8th 2026 at the ESA Future Skills Executive Roundtable, which brought together 25 senior stakeholders from industry, academia, and international organisations active in talent development. The Roundtable provided a dedicated space for informed exchange on the structural skills challenges facing the European space ecosystem, including the impact of technological change, increasing competition for talent, and the need for stronger alignment between education, workforce development, and sectoral demand. It explored how the sector can collectively address rapidly evolving skills needs through aligned and joint actions, resulting in shared orientations and recommendations.

This exchange represents an opportunity to initiate a longer-term, coordinated effort led by European Space Agency to foster sustained dialogue and collaboration across the European space ecosystem on future skills, in response to the growing strategic importance of human capital for Europe's competitiveness, autonomy, and capacity to deliver on its space ambitions.

"Building and sustaining a skilled and agile workforce is an advantage for Europe. As the European space sector faces growing pressures while also entering a phase of expansion and global competition, preparing for the future is not only a technological challenge, it is fundamentally a human one. As a key European institution, we at ESA have a responsibility to look ahead and help our ecosystem anticipate long-term capability needs. The Skills Digital Twin Initiative reflects this effort, and helps us build a shared understanding to start moving forward with actionable solutions for Europe's future."

— Marco Ferrazzani, Director of Resources and Services, European Space Agency

WHY THIS RESEARCH

Space has become a strategic domain for Europe's sovereignty, security, competitiveness and long-term industrial resilience. As the European space sector evolves, shaped by technological advancements, evolving industrial dynamics, and intensifying global competition, the availability and development of skills and competencies are emerging as critical factors in ensuring Europe's future position in the global landscape.

At the same time, structural challenges are becoming more evident, including misalignments between current workforce capabilities and evolving industry needs, growing demand for digital and transversal skills, and increasing competition for talent across adjacent sectors. Addressing these challenges requires a comprehensive and forward-looking understanding of the European space workforce, its evolution over time, and the skills that will be needed to support the sector's next phase of development.

WHY THIS RESEARCH

This study builds on an extensive body of existing literature on the European space workforce and skills landscape. The research draws on contributions from major institutions and initiatives, including the OECD *Handbook on Measuring the Space Economy*, Eurospace's industry analyses, the Space Skills Alliance studies on workforce dynamics and skills gaps, ESPI's research on employment and job postings, as well as broader strategic policy reports. Together, these sources provide a comprehensive foundation, covering workforce dynamics, employment structure, productivity, education pathways, skills needs and the broader evolution of the space economy.

Building on this foundation, this study is intended to complement existing perspectives through a data-driven and forward-looking approach. Its objective is to provide an evidence-based understanding of current and future skills within the European space ecosystem, supporting strategic decision-making through the mapping of existing competencies, the identification of emerging gaps, and the prioritization of intervention areas.

In particular, the study contributes by offering a more granular view of skills demand, by shedding light on talent circulation patterns, and by integrating the perspective of ecosystem stakeholders on future needs, technology-driven transformation and capability gaps.

To this end, the analysis integrates multiple sources of information, including large-scale data on job postings and professional profiles, as well as qualitative insights gathered through stakeholder engagement activities. This combined approach enables a robust and multidimensional view of workforce dynamics, capturing both quantitative trends and strategic perspectives, and contributing to a stronger evidence base for a more competitive European space workforce.

THE STRUCTURE OF THE STRATEGIC REPORT

This Report aims to synthesise key findings from research and stakeholder engagement activities, in order to provide a forward-looking assessment of skills and workforce needs across the European space ecosystem and support the identification of priority areas for action to enhance its competitiveness, resilience, and innovation. The Strategic Report is structured into five chapters outlined in the following paragraphs:

Chapter 1 The European space ecosystem and its workforce

The report begins by framing the broader context in which the European space workforce evolves. It outlines the transformation of the space ecosystem, its growing strategic relevance for European competitiveness and autonomy, and the main structural challenges affecting the sector, including productivity, workforce composition, concentration, and talent retention.

Chapter 2 The Skills Digital Twin of the European Space ecosystem

The second chapter introduces the report's core analytical backbone: the Skills Digital Twin. Leveraging a proprietary AI-based tool to analyse LinkedIn job postings, it provides a structured view of current labour demand, identifying the skills most requested by employers and highlighting the rise of digital skills and the emergence of more T-shaped talent profiles in the European space labour market.

Chapter 3 Talent circulation and adjacent sectors

The third chapter examines how aerospace talent moves across firms, sectors and geographies over time. Based on the reconstruction of career trajectories from LinkedIn profile data, it examines the extent to which Europe is able to convert aerospace education into long-term employment in the space sector, as well as the extent to which adjacent industries absorb aerospace-trained professionals.

Chapter 4 The voice of the European space ecosystem

This chapter complements the quantitative analysis with survey evidence collected from key stakeholders across the sector. It provides a qualitative perspective on future skills requirements, the organizational barriers that hinder technological adoption, the sectors competing most directly with space for talent, and the strategies currently perceived as most effective to mitigate skills shortages.

Chapter 5 ESA Future Skills Executive Roundtable

This chapter outlines the key insights that emerged from the Executive Roundtable, where senior stakeholders engaged with the main findings of the research and shared their perspectives on the most pressing challenges.

STUDY PLAYERS: THE ADVISOR AND THE WORKING GROUPS

The study benefited from the contribution of **Alice Bunn** (Former International Director, UK Space Agency), in the role of Scientific Advisor, who provided valuable guidance and recommendations throughout the project.
The European Space Agency (ESA) Working Group comprised of **Marco Ferrazzani** (Director of Resources and Services), **Ildikó Szőke** (Head of Human Resources) and **Ersilia Vaudo** (Special Advisor on Future Talents).
The study was coordinated by TEHA Group, led by **Valerio De Molli** (Managing Partner & Chief Executive Officer), **Corrado Panzeri** (Partner & Head of InnoTech Hub), **Matteo Polistina** (Senior Consultant & Project Leader), **Filippo Minisini** (Consultant), **Stella Chen** (Consultant), **Umberto Mille** (Consultant), **Arianna Basso** (Program Manager) and **Roberta Braccio** (Project Assistant),and operated with the support of ESA, through the contribution of **Ilaria Angelino**, **Aurora Tuozzi**, **Stavros Romios** and **Auni Siukosaari**.

To gather qualified insights from internal and external stakeholders across the space ecosystem, the study was supported by an extensive stakeholder engagement process. This included the organisation of one working group, a series of confidential one-to-one meetings conducted by TEHA Group with leaders from European and international companies and institutions, as well as ESA executives, with the aim of identifying key perspectives and strategic directions on talent strategies and skills evolution in the European space sector and a final executive roundtable.
For their collaboration and contributions, we would like to thank:

- Argotec
- Astroscale
- European Centre for the Development of Vocational Training (CEDEFOP)
- European Organization for Nuclear Research (CERN)
- Eni
- Epsilon Italia
- ETH Zurich
- EU Agency for the Space Programme (EUSPA)
- Italian Air Force
- KP Labs
- OECD Centre for Skills
- Orbex
- Scuola Superiore Sant'Anna
- Space Skills Alliance
- T4i
- Technical University of Munich
- UNESCO
- Polytechnic University of Milan
- Universitat Politècnica de Catalunya – BarcelonaTech
- GISIG Association
- Leonardo
- Surrey Satellite Technology
- Gdańsk University of Technology
- Titan Disruptive Innovation Center
- ArianeGroup
- Space Skills Alliance
- The Exploration Company
- German Aerospace Center
- Thales Alenia Space
- Matsuko
- Orbex
- SSC Space
- TU Delft
- OHB System AG
- LINKS Foundation
- GMV
- Eurisy
- KU Leuven

Chapter 1

The European space ecosystem and its workforce

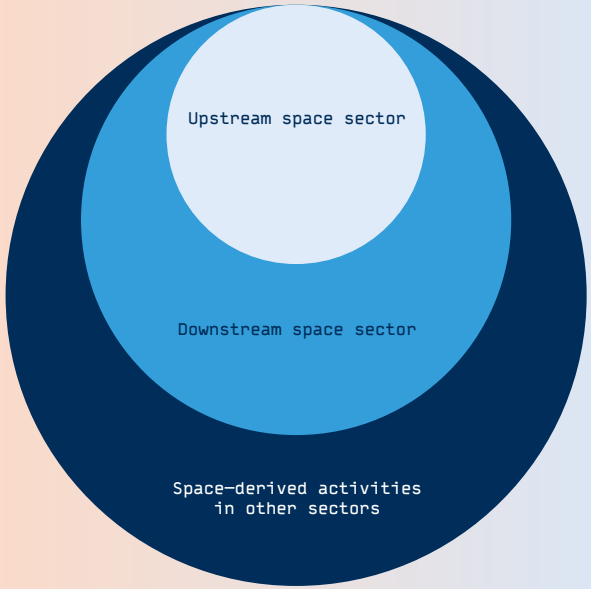
THE NEW SPACE ECOSYSTEM, SPACE IS NO LONGER A STANDALONE DOMAIN

The Space Economy is defined as the full range of activities and the use of resources in the course of exploring, researching, understanding, managing, and utilizing Space.

Over the past decade, the space sector has undergone a profound transformation with the integration of space into society and economy. Space infrastructure and data now provide services for citizens, P.A. and businesses. As a result, space systems value creation is no longer dominated by hardware performance alone, but increasingly by software, algorithms, and data use across missions and domains transforming core activities.

Traditionally, the space sector was considered as a standalone domain, primarily associated with scientific research and exploration. While this remains a critical pillar, it represents only a portion of today's broader space economy, which is increasingly overlapping with adjacent industries. The space ecosystem can be represented in three key segments. First, the upstream segment includes the scientific and technological foundations of space programs, manufacturing and production of space infrastructure. Second, the downstream segment covers all the operational uses of space infrastructure and 'down-to-earth' activities that directly rely on the provision of space capacity to exist and function. Third, the wider space economy includes space-derived activities in adjacent industries, particularly defence, security, and telecommunications (**Figure 1**).

Figure 1. **The main segments of the space sector**



A STRATEGIC AND ESSENTIAL SECTOR FOR EUROPEAN STRATEGIC AUTONOMY AND COMPETITIVENESS

At the European level, space is explicitly identified as a strategic sector essential for European sovereignty, autonomy, competitiveness and security. In particular, this is reinforced by two reports on EU competitiveness commissioned by the European Commission and published in 2024: 'Future of European Competitiveness' by Mario Draghi and 'Much more than a market' by Enrico Letta. Together, they offer a complementary perspective on why a strong and resilient European space sector is essential to Europe's future.

On the one hand, in Mario Draghi's EU competitiveness report, space is treated as a strategic sector mainly because it underpins sovereignty, security, and critical infrastructure (navigation/timing, Earth observation, secure connectivity), and because Europe is at risk of losing strategic autonomy if it depends on non-EU launch and satellite ecosystems. The report highlights a large investment gap versus competitors: it states that for decades Europe's investment has been ~15–20% of US levels, and that 2023 public space spending was about $15bn in Europe vs $73bn in the US, with China expected to rise further. On the other hand, the 'Much more than a market' report outlines the importance of a dynamic space sector, capable of thriving in the harsh global competition and providing the appropriate instruments for Europe's strategic autonomy and security.

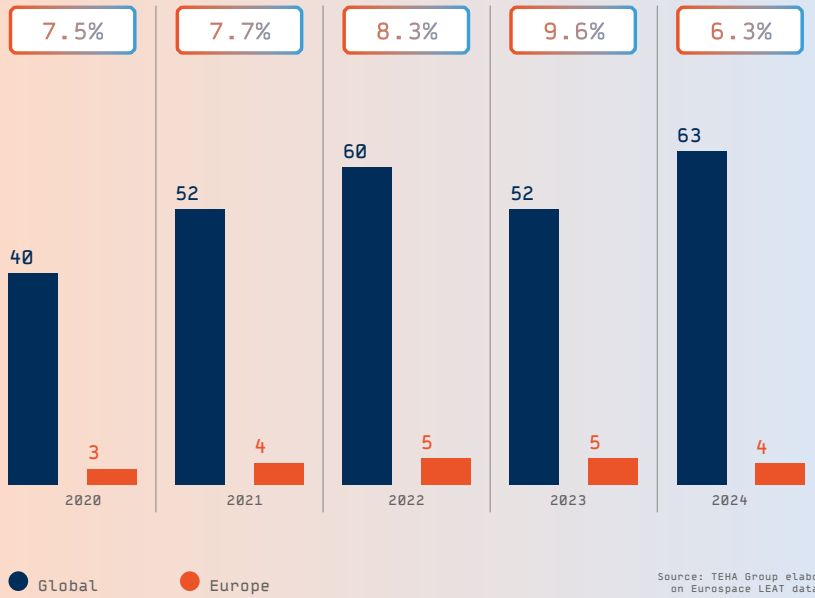
Both reports converge on a common diagnosis: Europe's current approach, characterized by fragmentation of institutional actors and rules, a weighted distribution of funding across Europe for the full spectrum of activities, and insufficient financial instruments to stimulate private capital, must be revised. They advocate for a more integrated and harmonized strategy, that simplifies the institutional landscape, improves coordination and strengthen funding mechanisms to accelerate innovation, scaling and investment across the space ecosystem.

THE EUROPEAN SPACE ECONOMY IS EXPANDING, BUT MORE SLOWLY THAN THE GLOBAL SPACE INDUSTRY AS A WHOLE

The European space economy has grown by around +30% since 2020, reaching an upstream market value of around 4 billion USD in 2024. However, despite the absolute growth, Europe's relative position is weakening. Over the same period, the global space economy increased by approximately +56%, meaning Europe is losing share and strategic importance in a rapidly increasing market. In 2024, Europe accounted for 6.3% of the global total, a decline of -1.2 percentage points compared to 2020 (**Figure 2**).

The weakening of relative position of the European space economy is mainly rooted in a funding and demand gap compared to the international competitors, US, China and Russia. This gap is critical because it is limiting the ability of Europe to generate a repeatable, protected volume, constraining Europe's capacity to move beyond long life-cycle, highly customised one-off missions toward scalable, productised systems with speed of innovation and deployment.

Figure 2. **Upstream space market value (billion USD), 2020 – 2024.**



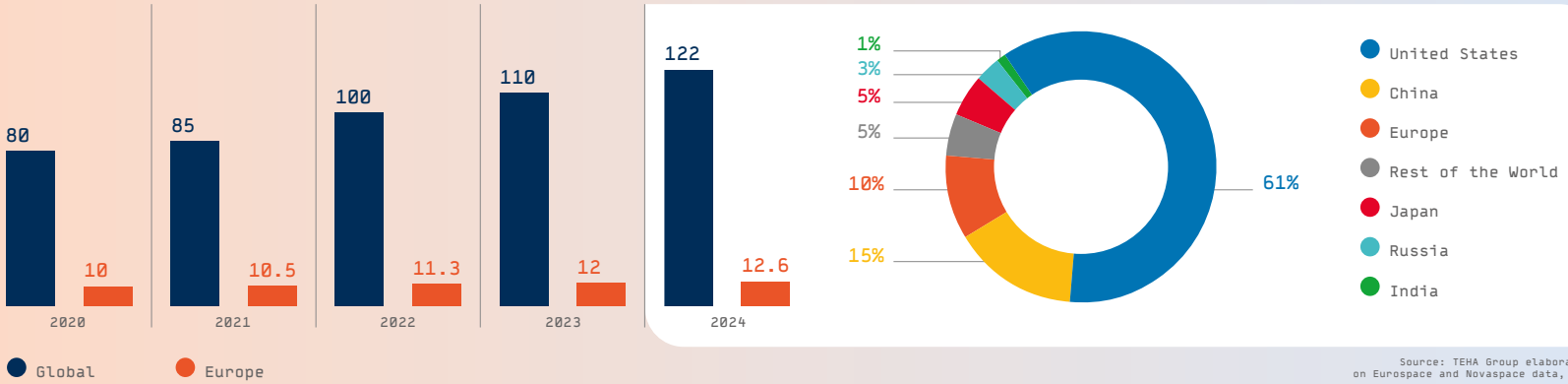
Source: TEHA Group elaboration on Eurospace LEAT data, 2026

GLOBAL PUBLIC SPENDING REACHED AN ALL-TIME HIGH, BUT EUROPE'S GROWTH HAS OCCURRED ONLY IN ABSOLUTE TERMS

European public space spending rose to a record USD 12.6 billion in 2024, an increase of 26% since 2020. However, this growth has lagged behind the faster expansion of global institutional budgets, resulting in a marked loss of relative weight.

As a consequence, Europe's share of global public space spending fell to around 10% in 2024, down from about 15% five years earlier. By comparison, the United States and China represent the dominant institutional spenders, accounting for approximately 61% and 15% of global public space budgets, respectively (**Figure 3**). This imbalance has direct industrial implications. European prime contractors must compete in open global markets while operating with significantly lower institutional backing than their US and Chinese counterparts, limiting their ability to scale, invest, and secure sustained demand for major programmes.

Figure 3. **Total Public investments in space economy* Global and Europe, (billion USD), 2020 – 2024 (Left) and (% value) 2024 (Right).**



Source: TEHA Group elaboration on Eurospace and Novaspace data, 2026

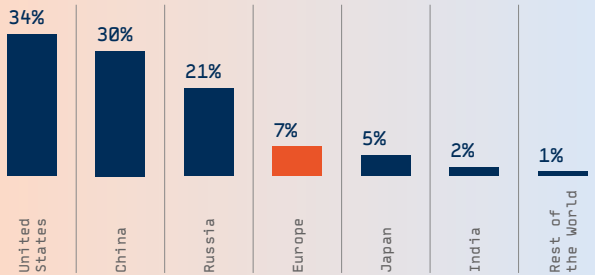
BEYOND THE FUNDING GAP, EUROPE LAGS COMPETITORS IN BOTH INSTITUTIONAL SCALE AND COMMERCIAL LAUNCH CADENCE

Europe accounts for only 7% of the total mass launched for government programs between 2015 and 2024, compared to 34% for the US and 30% for China (**Figure 4**). This significant gap is mainly explained by the absence of a large-scale European human spaceflight program, one of the major drivers of the heavy mass launched by the US, China, and Russia capturing space demand.

At the same time, the rapid rise of vertically integrated constellations reshaped the market, allowing competitors to dominate also on launch frequency and volume in ways Europe has not yet matched. In 2024, the US conducted more than half of global launches, of which around 60% (90) were conducted by SpaceX to launch Starlink (**Figure 5**).

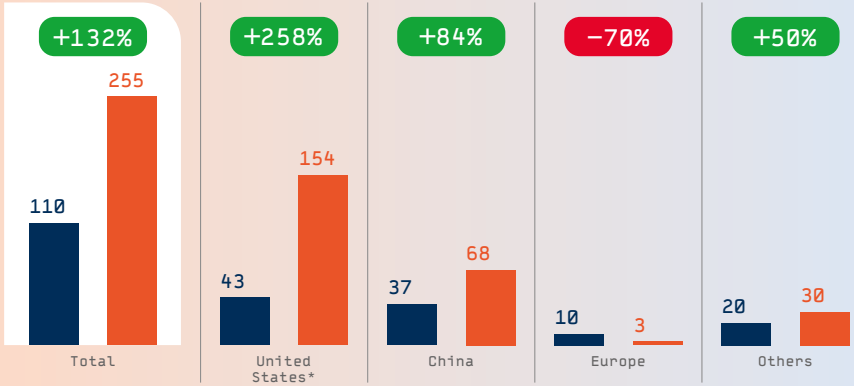
Europe's launch industry has struggled to capture the new volume created by the space economy's shift from GEO (Geostationary Orbit) missions toward LEO (Low Earth Orbit) constellations. It has remained anchored to traditional one-off missions and has not yet adapted the scalable, industrialised, and rapid deployment model that now defines competitiveness.

Figure 4. **Spacecraft mass* by production region (% values), 2015 – 2024.**



Source: TEHA Group elaboration on Eurospace LEAT data, 2026

Figure 5. **Number of launches by origin of Launch Service Provider (absolute values), 2020 and 2024**



*tons, civil and defence, government programmes only

Source: TEHA Group elaboration on Novaspace data, 2026

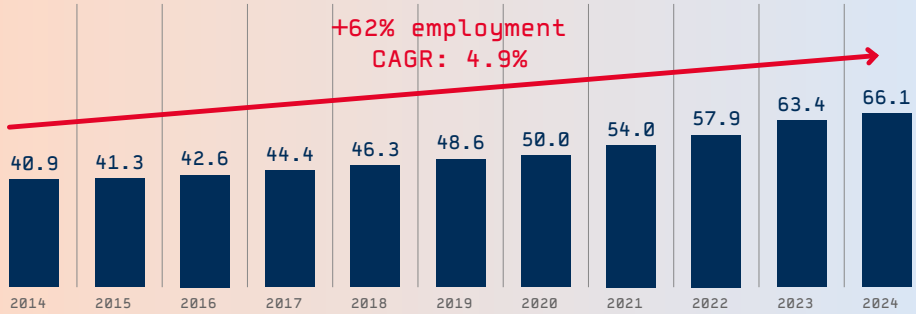
FOCUSING SPECIFICALLY ON EUROPE'S WORKFORCE, FOUR MAJOR CHALLENGES ARE CONSTRAINING THE SECTOR'S DEVELOPMENT

The European upstream sector has shown a stable workforce growth with an annual growth around 5%, reaching 66.1k FTE in 2024 (**Figure 6**). This can be read as a signal of a growing talent base and a broadly healthy industrial ecosystem in terms of jobs. However, headcount growth alone is not enough to close the competitiveness gap described earlier (low funding intensity, industrialization, and speed).

At a European level, four structural issues are holding the market back:

1. **Productivity decline**
2. **Limited workforce diversity**
3. **Talent unevenly distributed** (country & company type)
4. **Competition from adjacent sectors**

Figure 6. **Total FTE in Upstream sector Europe (thousand FTE), 2014 – 2024.**

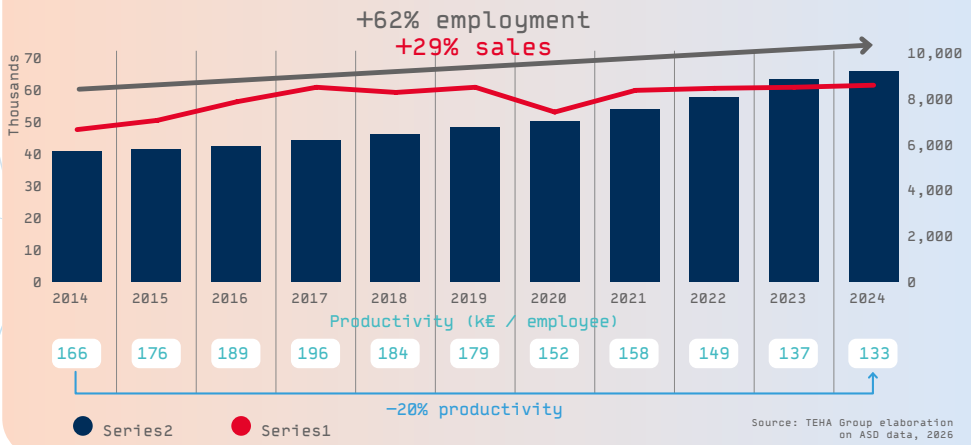


Source: TEHA Group elaboration on ASD data, 2026

OVER THE PAST 10 YEARS, THE EUROPEAN SPACE SECTOR PRODUCTIVITY DECLINED, IN CONTRAST WITH THE PRODUCTIVITY GROWTH ACHIEVED IN OTHER SECTORS ACROSS EUROPEAN COUNTRIES

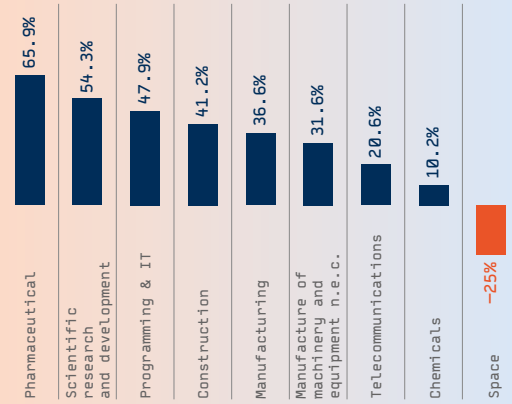
Employment grew two times faster than sales over the past decade (+62% vs +29%). As a result, productivity, measured as sales per employee, fell by 20%, from €166k per employee in 2014 to 133k (**Figure 7**).
The gap becomes even clearer compared with other major EU sectors: while the space sector's productivity declined by 20% over 10 years, pharmaceuticals increased by 65.9%, programming & IT by 47.9%, and the broader manufacturing industry by 36.6% (**Figure 8**). This may be partially explained by the growing number of new space companies, many of which are still in the scale-up phase, where headcount and capabilities are built ahead of revenue generation.

Figure 7. **European space industry employment (left), sales (right), productivity (bottom) (thousands, million €, thousand € per employee), 2014-2024.**



Source: TEHA Group elaboration on ASD data, 2026

Figure 8. **Relative Productivity differential (Turnover per employee) EU27 (% value), 2014-2024.**

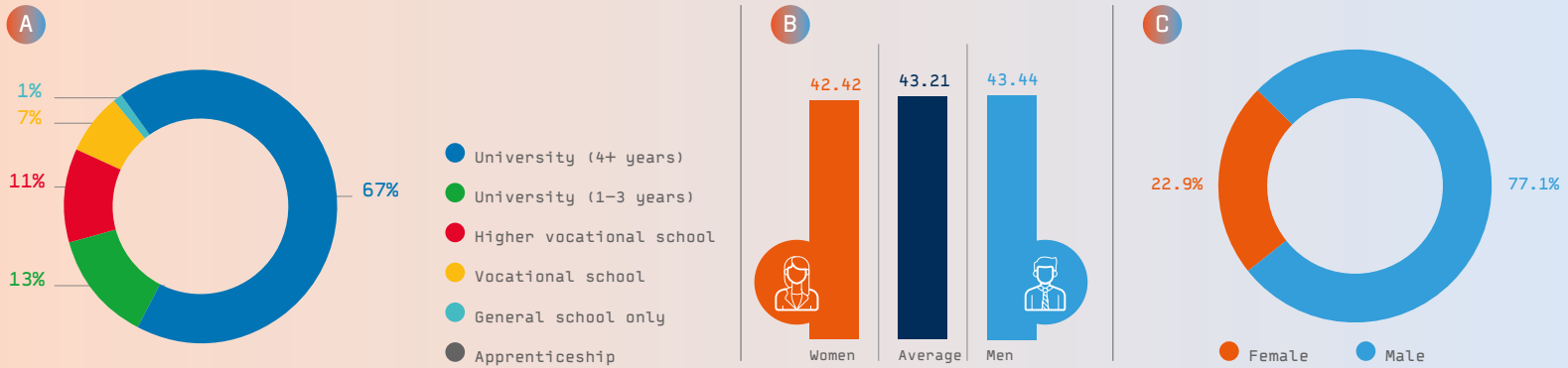


Source: TEHA Group elaboration on Eurostat data, 2026

THE EUROPEAN SPACE WORKFORCE IS CHARACTERIZED BY HIGHLY SKILLED AND EDUCATED TALENT, BUT WITH LIMITED DIVERSITY

The space sector attracts a high share of highly skilled workers, with 67% of employees holding Master's or PhD-level degrees (**Figure 9A**). This reflects the sector's strong reliance on advanced engineering skills and its inherently knowledge-intensive nature. However, the talent pool remains underrepresented by women, accounting for only 22.9% of the workforce with an average age of 43.2 years (**Figure 9B** and **9C**). This gender imbalance is broadly in line with STEM occupations overall, but it remains a structural issue for widening the talent pipeline and improving long-term workforce sustainability. While gender remains a key dimension, diversity should be pursued across all its forms—including educational backgrounds, nationalities, disciplines, and career pathways. Broadening the talent base beyond traditional profiles can enhance the sector's long-term competitiveness and resilience.

Figure 9. **Space industry employees' qualification (% values), 2023 (9A, Right); Average age of space industry employees Europe (absolute value), 2023 (9B, Center); Gender distribution of the space workforce Europe (% value), 2023 (9C, Left).**



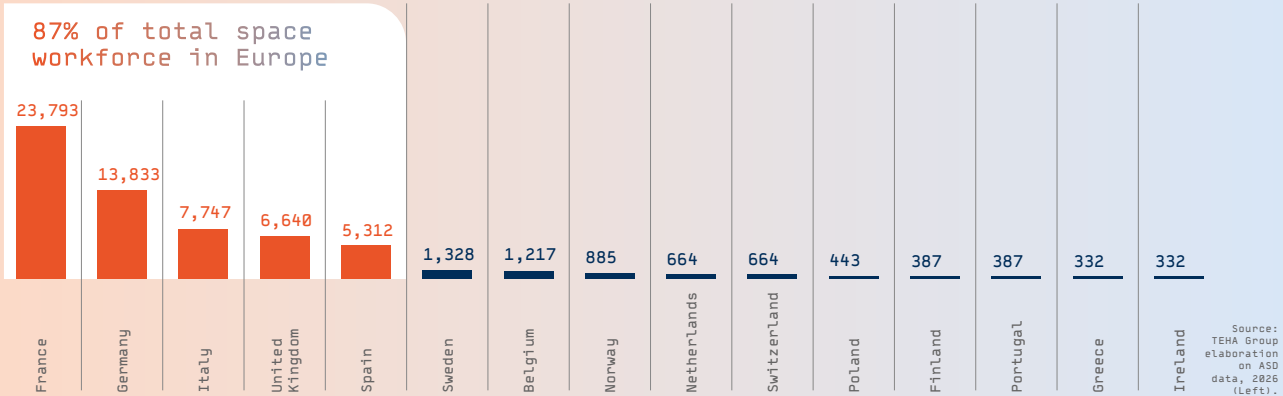
Source: TEHA Group elaboration on ASD data, 2026

TALENT IS UNEVENLY DISTRIBUTED AT BOTH A GEOGRAPHICAL AND AN INDUSTRIAL LEVEL

Another key structural problem is talent concentration. On the one hand, geographical concentration, where talent is unevenly distributed across a small number of countries. More than 80% of total space workforce in Europe is concentrated in 5 countries, namely, France, Germany, Italy, UK and Spain (**Figure 10**). This limits cross-European scaling and makes it harder to build continent-wide supply chains that can support high-cadence production.

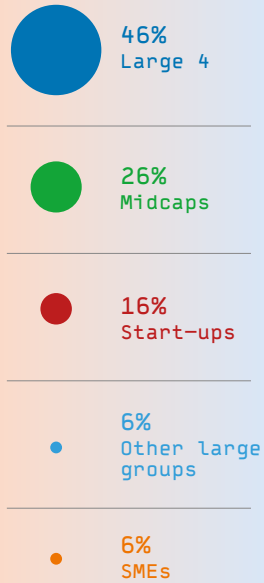
On the other hand, there is industrial concentration, with four large industrial groups responsible for half of the total European space employment (**Figure 11**). While this provides stability and critical mass, it can also slow down market dynamics, reducing competitive pressure and cross-firm mobility, limiting the density of interactions typical of fast-innovating ecosystems, and raising barriers for new entrants and smaller suppliers to scale and access major programs.

Figure 10. **Distribution of FTEs in Europe Top 15 European countries (absolute values), 2024.**



Source: TEHA Group elaboration on ASD data, 2026 (Left).

Figure 11. **Space industry employment by size (% values), 2024.**



Source: TEHA Group elaboration on ASD data, 2026 (Right).

POOR RETENTION OF TALENT IS LIMITING TALENT AVAILABILITY

Talent retention is a final structural challenge for Europe's space sector. While intra-sector mobility does not directly reduce the overall talent pool, persistent retention difficulties at company level can, over time, erode the industry's ability to retain skilled workers, particularly when wage pressures and limited development paths push talent toward adjacent sectors.

At the firm level, competition for talent comes both from within the space ecosystem and from adjacent sectors. Internal competition is cited as a key driver of poor retention by 57% of respondents to the Space Skills Alliance survey, while talent outflows to adjacent sectors, though less frequent, still affect 16% of companies.

At the same time, sector-specific conditions also contribute to attrition. Low salaries are reported as a retention issue by 48% of respondents, and a lack of career development opportunities by 34%. These factors are particularly relevant from a sector-wide perspective, as dissatisfied talent may exit space altogether rather than move between competitors (**Figure 12**).

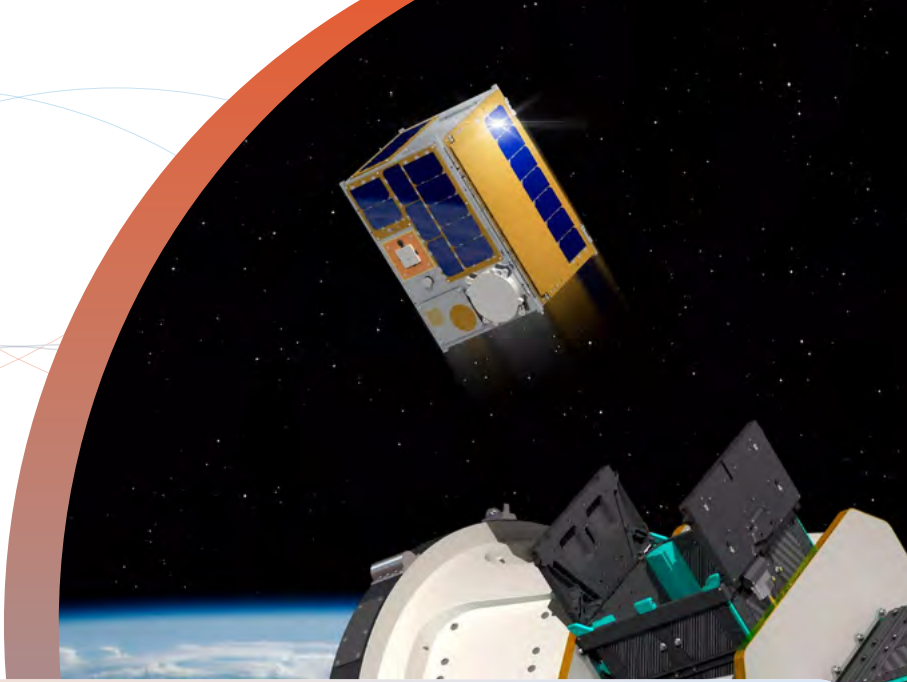
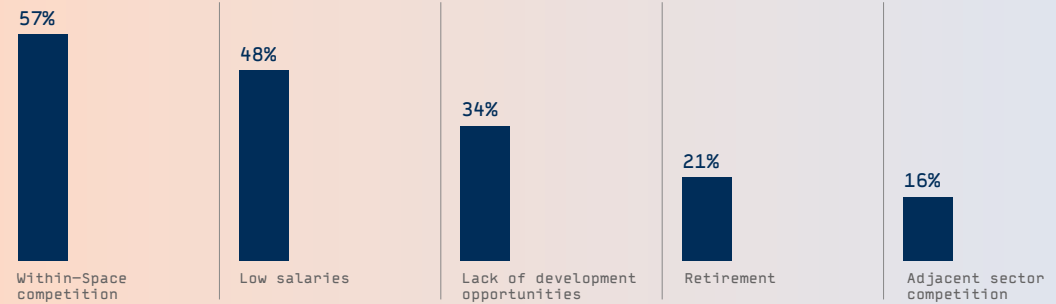


Figure 12. **Causes of poor retention (% value), 2023.**



Source: TEHA Group elaboration on Space Skills Alliance data, 2026

EUROPE'S SPACE WORKFORCE COULD HIT 104K FTE BY 2030, BUT SEVERAL CHALLENGES MUST BE ADDRESSED

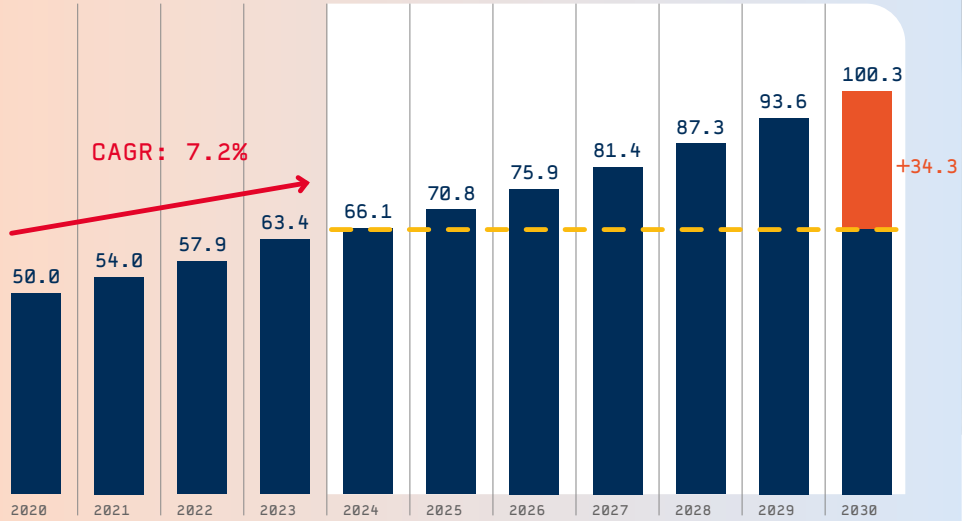
If the growth pace observed since 2020 is maintained, Europe's space workforce could reach around 100k FTE by 2030, an increase of around 52% (about +34.3k FTE) (**Figure 13**). This projected expansion signals strong momentum, but it also raises the stakes: scaling headcount without addressing the structural constraints identified in this chapter would risk widening the gap between workforce size and industrial performance.

To ensure that workforce growth translates into competitiveness, Europe will need to act on two fronts. First, it must tackle these structural challenges to unlock productivity, broaden participation, and enable cross-European scaling. Second, it must anticipate and adapt to the technological shifts reshaping the upstream sector.

The following chapters deepen this analysis by examining the European space workforce in greater detail, focusing on skills demand and its evolution, workforce mobility across firms, sectors, and geographies, and a review of relevant international workforce initiatives.

The analysis maps current needs across the space ecosystem, identifies emerging and critical skills gaps, and tracks sectoral and geographical mobility patterns. Finally, it proposes practical recommendations to support the development of a competitive, future-ready talent base for the European space sector.

Figure 13. **Total FTE in Upstream sector Europe (thousand FTE), 2020 – 2030e.**



Source: TEHA Group elaboration on ASD data, 2026

Chapter 2

The Skills Digital Twin of the European space ecosystem

THE SKILLS DIGITAL TWIN OF THE EUROPEAN SPACE ECOSYSTEM

Workforce and talent are key drivers of industrial competitiveness. In the European space ecosystem, they have become a strategic constraint: without a stronger and future-oriented talent base, Europe risks further erosion of its position in an increasingly competitive global space environment. Strengthening the workforce is therefore not only a human-capital priority, but a prerequisite to sustain leadership, accelerate industrialization and maintain strategic autonomy.

A clear view of how skills are evolving is essential. Understanding which competencies companies are demanding, where shortages are emerging and how roles are transforming provides a practical way to assess the sector's ability to innovate and remain competitive. It also enables policymakers and industry to anticipate the critical skills Europe will need tomorrow, rather than reacting only once the gap has already become a constraint.

To support this objective, the report develops a *Skills Digital Twin* of the European Space ecosystem: a structured mapping of the workforce skills and talent demand distribution across the European aerospace sector, with the goal of identifying and analysing current and future skill gaps.

The analysis relies on a proprietary AI-based system designed to extract and process large volumes of unstructured LinkedIn data, enabling scalable, data-driven insights into skills demand and its evolution over time.

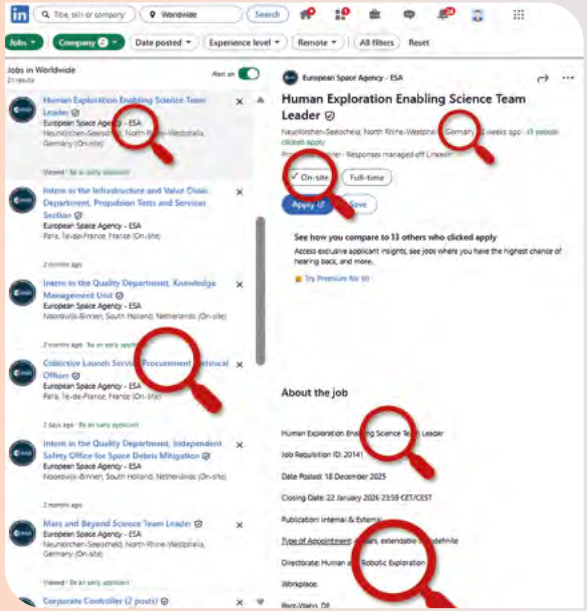
LINKEDIN-BASED ANALYSIS TO TURN FRAGMENTED ONLINE JOB-POSTING DATA INTO A STRUCTURED VIEW OF EUROPE'S AEROSPACE SKILLS DEMAND

More specifically, the LinkedIn-based tool combines two complementary technologies, web scraping and Natural Language Processing (NLP), to collect, structure and interpret large volumes of unstructured labour-market data.

First, web scraping techniques are used to systematically collect job postings and professional profile information from LinkedIn. This process enables the construction of a structured dataset capturing job advertisements across leading aerospace companies, including key attributes such as job title, employer, location, seniority level, contract type, number of applicants, job description, and listed requirements.

Second, NLP methods are applied to the textual content of job descriptions in order to extract, classify, and cluster the skills mentioned in the postings, distinguishing between technical skills and transversal competencies, and identifying recurring skill bundles across roles and sub-sectors.

By integrating web scraping and NLP, the approach converts large volumes of unstructured online information into structured, evidence-based insights on skills demand in the European aerospace and space labour market. This provides a robust foundation to assess which hard and soft skills are most sought by employers and how demand is evolving over time. The detailed methodology and sample selection criteria are provided in Appendix A.



Information extracted:

- Job title
- Company name
- Office location
- Place of work
- Number of applicants
- Seniority level
- Contract type
- Skills
- Job description

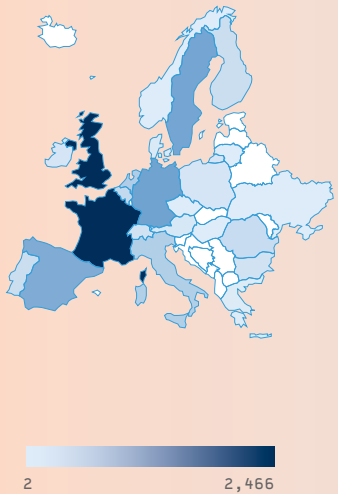
The tool collects all job postings published on LinkedIn in Europe by space enterprises after 15 December 2025 (the tool's launch date).

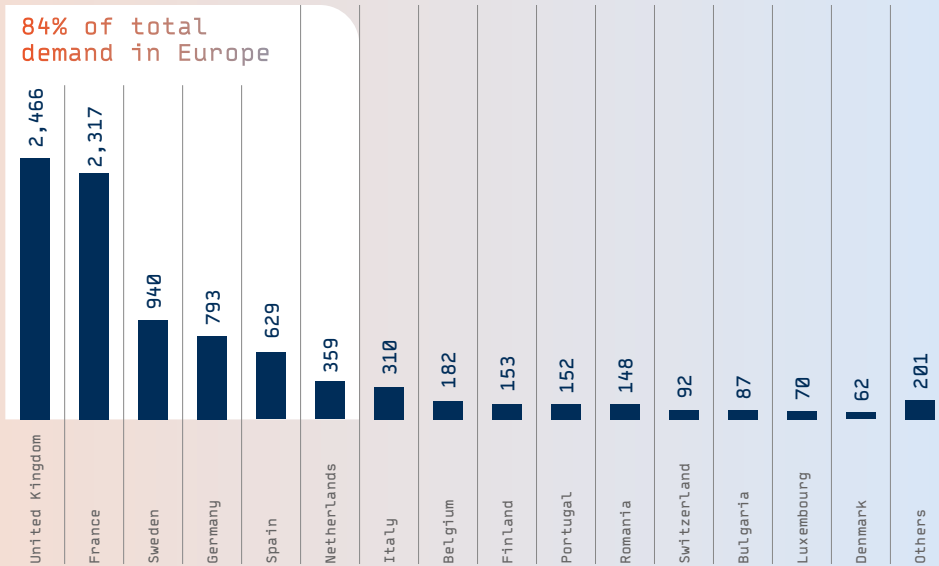
EUROPEAN SPACE HIRING DEMAND IS HIGHLY CONCENTRATED GEOGRAPHICALLY, WITH SIX COUNTRIES ACCOUNTING FOR MORE THAN 80% OF JOB POSTS

The LinkedIn-based analysis covers around three months of job postings, from 15th December 2025 to 30th March 2026. It includes more than 8.9k LinkedIn job advertisements published by European space and aerospace organizations, equivalent in volume to around 14.2% of the current European aerospace workforce. This coverage can be considered a reasonable proxy for active labour market demand, although its representativeness is constrained by the limited observation window and may introduce biases related to seasonality, temporary demand fluctuations, and other short-term factors.

The evidence reveals a strong geographical concentration of hiring activity. Approximately 84% of all job postings originate from just six countries, namely the United Kingdom, France, Sweden, Germany, Spain, and the Netherlands (**Figure 1**). These countries collectively form the core employment hubs of the European space ecosystem, hosting a large share of prime contractors, system integrators, research centres, and fast-growing space start-ups.

Figure 1. **Job posts distribution by country (left: geographical representation; right: absolute values), 15/12/25 – 30/03/26.**





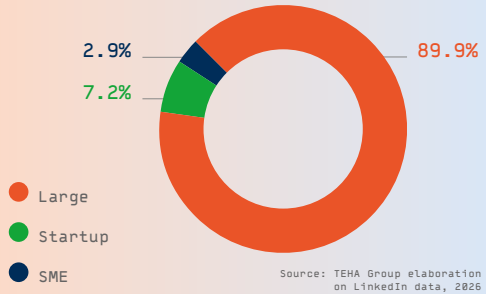
Source: TEHA Group elaboration on LinkedIn data, 2026

DEMAND CONCENTRATION EXTENDS TO COMPANY SIZE, WITH LARGE FIRMS ACCOUNTING FOR NEARLY 90% OF JOB POSTINGS

This concentration is not only geographical, but also structural. Labour demand in the European space sector is heavily concentrated by company size (see Appendix A for more details on company classification), with large firms accounting for approximately 90% of all job postings, while startups, represent just 7.2%, and SMEs only 2.9% (**Figure 2**). This underscores the dominant role of established industrial players in shaping workforce demand, with their extensive programme portfolios, long-term contracts, and stable institutional funding.

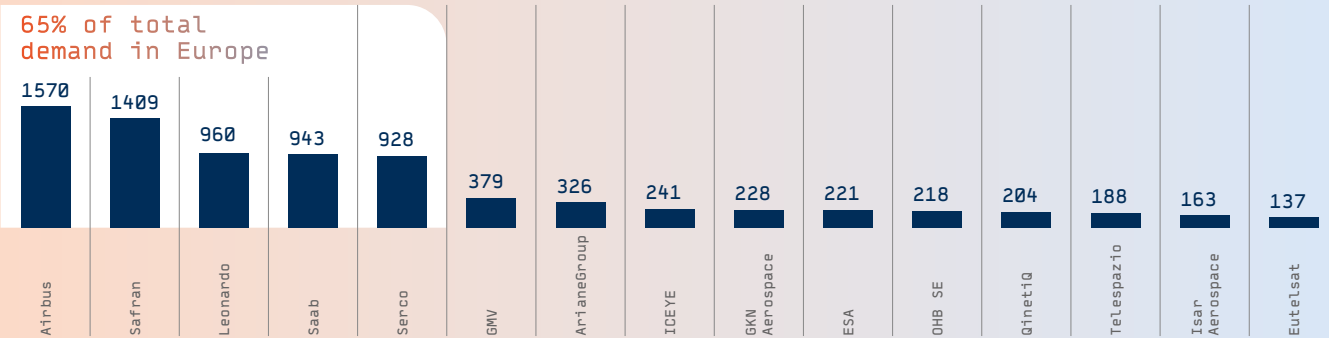
At firm level, the concentration is even more striking: 65% of total European job postings come from just five enterprises, with Airbus leading, followed by Safran, Leonardo, Saab and Serco, while the remaining firms in the top 15 contribute substantially smaller volumes (**Figure 3**).

Figure 2. **Job posts distribution by company type (% values), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

Figure 3. **Top 15 companies with most job posts (absolute values), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

CROSS-BORDER HIRING IS INCREASINGLY COMMON IN THE SECTOR, SIGNALLING THE GRADUAL EMERGENCE OF A MORE PAN-EUROPEAN AEROSPACE TALENT MARKET

Companies in the European space ecosystem are increasingly publishing job postings outside their headquarters country, reflecting a progressively pan-European recruitment strategy. This suggests that firms are looking beyond national labour markets to meet growing demand for specialised skills.

Among the analysed companies, Airbus and Leonardo record the highest number of job postings outside their home countries, with 868 and 832 vacancies respectively (**Figure 4**). Together, these two companies account for 1,700 cross-border positions, representing approximately 20% of all job postings in the dataset.

Other major industrial players show similar patterns, although at a smaller scale. Among the other top five companies by total number of job posts, Safran records 268 postings outside its headquarters country, Saab 93 and Serco 75.

This evidence points a growing internationalisation of recruitment across the European space ecosystem, with firms increasingly relying on a multi-country hiring footprint to access specialised competencies and support workforce expansion.

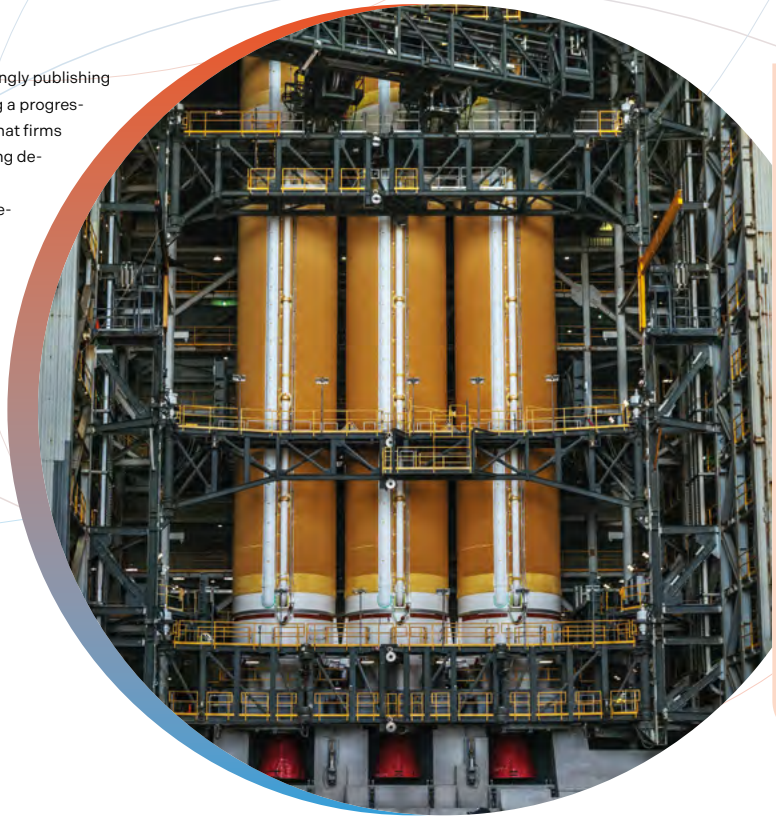
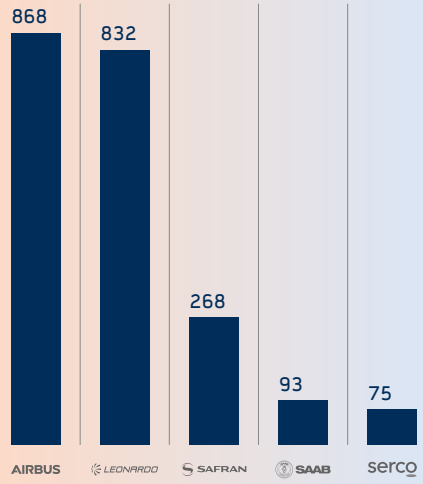


Figure 4. **Job posts demand outside of HQ country, top 5 companies with most job posts overall (absolute values), 15/12/25 – 30/03/26.**



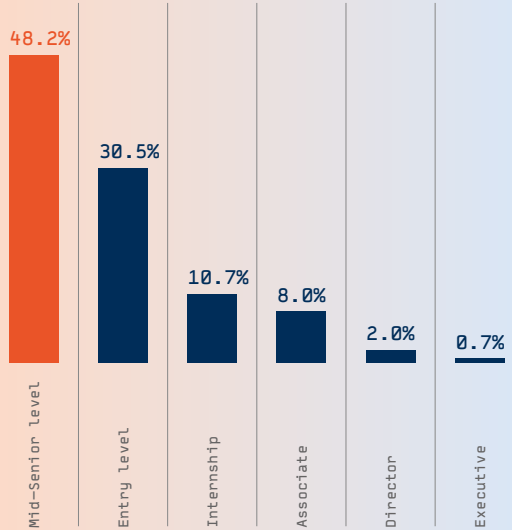
Source: TEHA Group elaboration on LinkedIn data, 2026

AEROSPACE HIRING DEMAND IS CONCENTRATED IN MID-SENIOR-LEVEL ROLES, REPRESENTING 48.2% OF THE TOTAL SAMPLE

Another feature of current labour demand is its concentration in experienced talent, with hiring demand largely focused on mid-senior roles, which account for 48.2% of total job postings, while entry-level positions represent 30.5% and associate roles 8.0% (**Figure 5**). Combined, these two categories amount to 38.4% of total demand, remaining below the share of mid-senior roles. This gap suggests that companies prioritise the recruitment of experienced profiles over junior talent, placing greater emphasis on immediately deployable skills and operational readiness than on the training and talent-development efforts needed to build capabilities internally.

Internships represent 10.7% of postings, showing that the sector does offer entry points for early-career talent. Still, their relatively modest share suggests that these channels remain secondary to the recruitment of already experienced candidates.

Figure 5. **Job posts distribution by seniority (% values), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

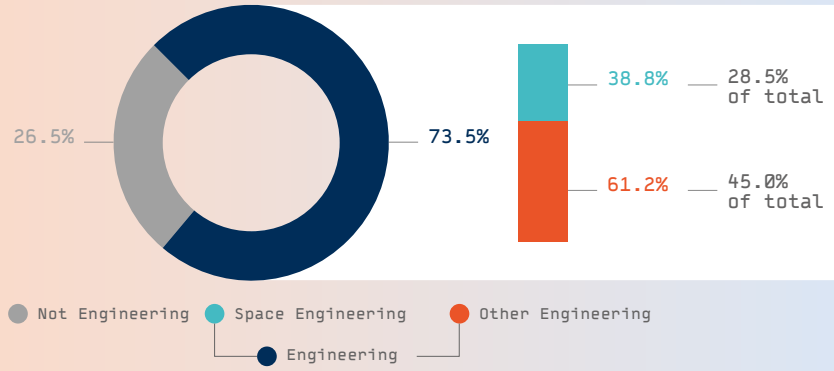
EUROPE'S AEROSPACE TALENT DEMAND IS ENGINEERING-LED, AND IT REMAINS ANCHORED IN BROAD SYSTEM CAPABILITIES RATHER THAN SOLELY ON SPECIALISED SPACE PROFILES

To better understand the composition of labour demand, all job advertisements were classified based on job title and description into two macro-categories: *Engineering* roles and *Non-engineering* roles. Engineering roles were then further segmented into sub-categories, distinguishing between *space engineering* profiles and *other engineering* profiles.

The results show that hiring demand in the European aerospace ecosystem is mostly engineering-driven, with 73.5% of job posts seeking engineering roles, compared with 26.5% for non-engineering positions (**Figure 6**).

Within the engineering perimeter, 38.8% of postings correspond to space engineering roles, while the larger share, 61.2%, relates to other engineering profiles. Among these, the most frequently requested are Software Engineering (13% of total engineering posts), Quality Engineering (12%), Mechanical Engineering (11%). This indicates that, although the sector is highly engineering-intensive, demand is not concentrated solely in space-specific profiles, but it relies to a large extent on broader engineering capabilities that support the design, integration, operation and scaling of aerospace systems. This distribution implies that Europe's space ecosystem is not only competing for highly specialised space talent, but also for a wider pool of core engineering profiles that are in demand across multiple industries, exposing the sector to broader cross-sector competition.

Figure 6. **Job posts distribution by type of educational background (% values), 15/12/25 – 30/03/26.**



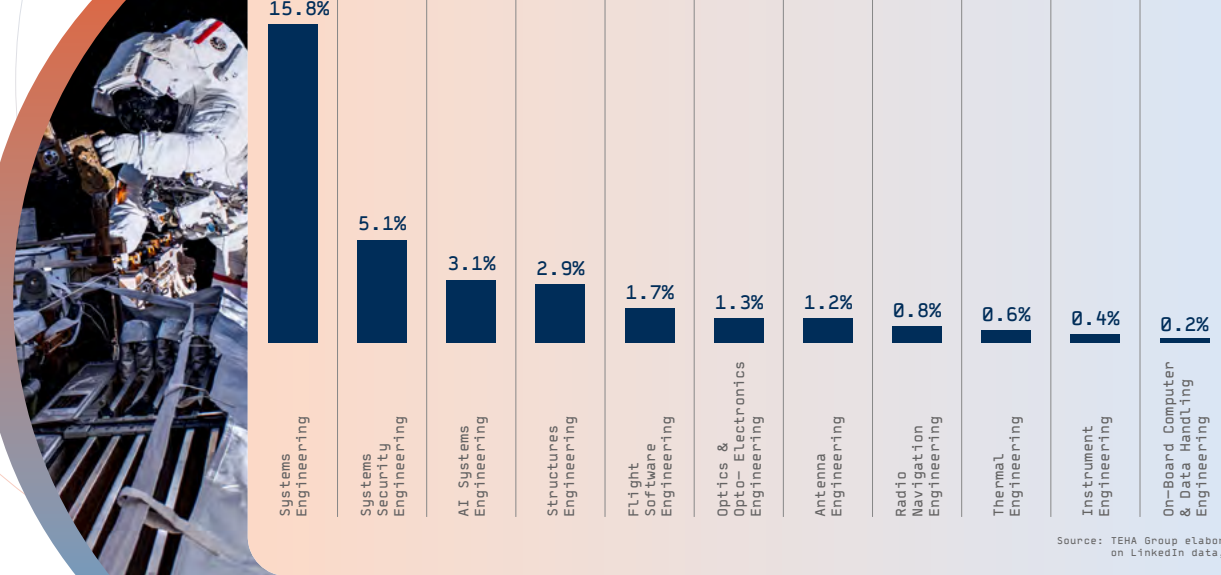
Source: TEHA Group elaboration on LinkedIn data, 2026

ONE IN SIX SPACE ENGINEERING JOB POSTINGS SEEKS SYSTEMS ENGINEERING PROFILES

A more granular view of space engineering postings, particularly across the space engineering sub-categories most relevant to ESA, shows a concentration in a few technical domains. Systems engineering is the most demanded space engineering sub-category, accounting for 15.8% of all engineering jobs, followed by Systems Security Engineering (5.1%), AI Systems Engineering (3.1%), and Structures Engineering (2.9%) (**Figure 7**).

Notably, the relevance of AI Systems Engineering and Flight Software Engineering points to a gradual shift in the technical backbone of the sector. As space systems become more software-defined, autonomous, and data-intensive, demand is expanding for hybrid engineering capabilities that combine classical aerospace knowledge with digital and software expertise.

Figure 7. **Job posts distribution by type of role, space engineering focus (% of total engineering roles), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

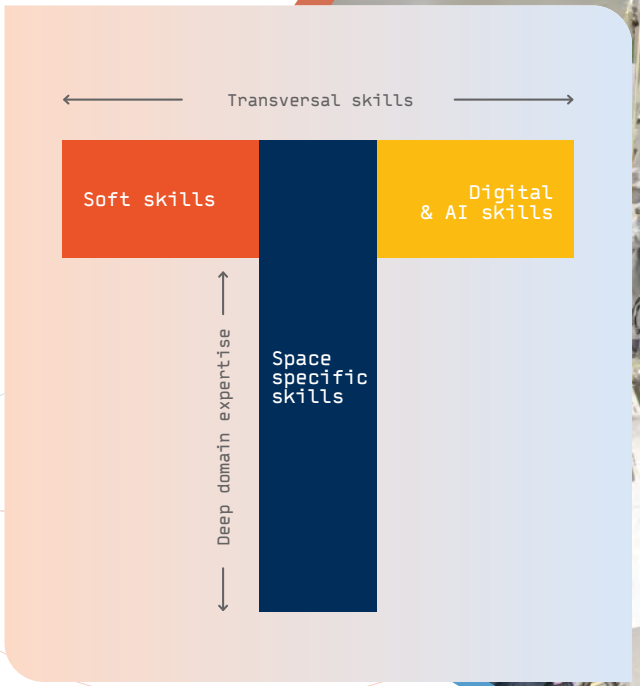
MOVING TOWARDS A T-SHAPED TALENT PROFILE THAT COMBINES TECHNICAL EXPERTISE WITH TRANSVERSAL CAPABILITIES

This shift in the role mix is also reflected in the underlying skills profile emerging from job postings. To better interpret the skills demanded in vacancies, the analysis groups competencies into eight clusters, which can in turn be organised into broader macro-clusters:

- **Transversal soft skills**: the soft capabilities including analytical thinking, problem-solving, communication, teamwork, and coordination;
- **Digital and AI skills**: largely transversal and increasingly relevant across sectors, but treated separately to capture the rising importance of software, data, and AI capabilities;
- **Space-specific skills**: domain-oriented technical expertise directly linked to the design, development, and operation of space systems, including also frontier technologies that reflect emerging capabilities shaping the future of the sector.

This structure can be read through the lens of T-shaped skills, a framework increasingly used to describe the capabilities required in complex, technology-driven industries. In this model, professionals combine deep expertise in a specific domain (the vertical dimension of the "T") with broader transversal competencies that enable collaboration across disciplines (the horizontal dimension).

The objective is to assess whether the European space labour market is already moving towards this T-shaped profile, in which specialised engineering expertise is increasingly complemented by the transversal and digital capabilities needed to manage complex, multidisciplinary programmes.

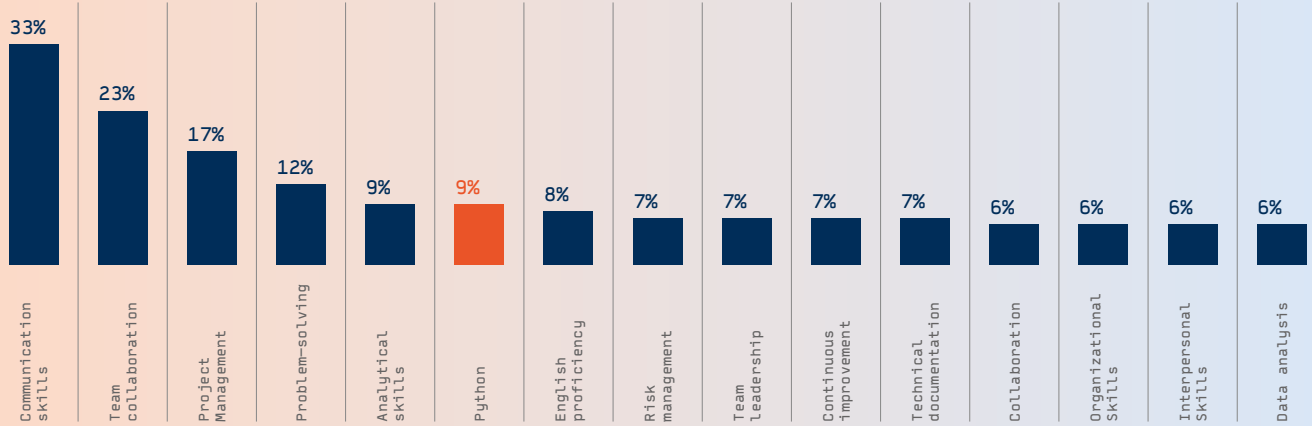


TRANSVERSAL CAPABILITIES LEAD RECRUITMENT DEMAND, WHILE PYTHON STANDS OUT AS THE TOP TECHNICAL SKILL

The analysis highlights the strong prominence of transversal competencies in aerospace job postings. Communication skills appeared in 33% of postings, followed by team collaboration (23%), project management (17%), problem-solving (12%) and analytical skills (9%). This pattern reflects the collaborative and multidisciplinary nature of aerospace programs, where coordination across complex technical systems and project teams is essential (**Figure 8**).

Among technical competencies, Python emerges as the most frequently cited programming skill, appearing in approximately 9% of job postings. Its prominence reflects the growing importance of data analysis, software development, automation and modelling within modern aerospace activities. The distribution suggests that aerospace employers increasingly value a combination of strong interpersonal capabilities and technical-digital expertise. This trend is consistent with the T-shaped skill profile, where specialised technical knowledge is complemented by transversal competencies enabling professionals to operate effectively within complex, multidisciplinary engineering environments.

Figure 8. **Top 15 skills demanded in job posts (% values), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

TRANSVERSAL SKILLS ARE THE MOST PERVASIVE ACROSS JOB POSTINGS, WHILE DIGITAL DEMAND IS HIGHEST AMONG STARTUPS AND SMES

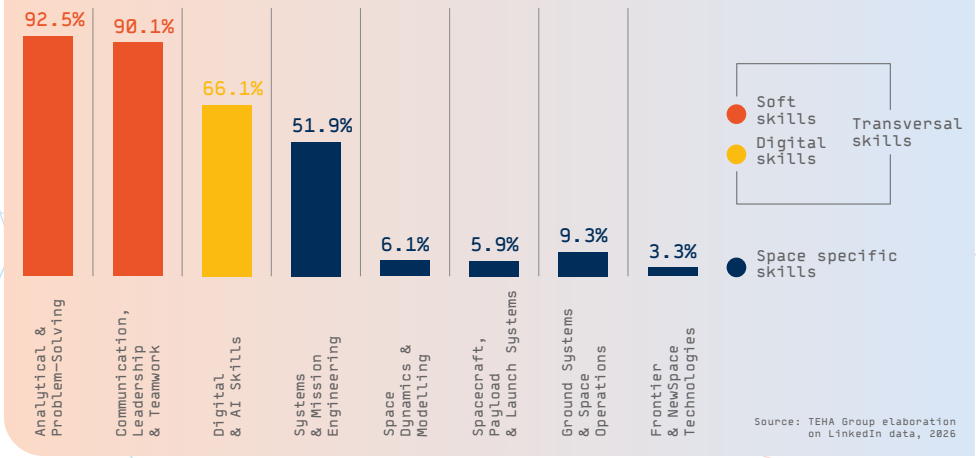
This signal becomes even more evident when skills are aggregated into broader clusters. Transversal competencies are the most widespread: 92.5% of job postings require analytical and problem-solving skills, while 90.1% demand communication and teamwork, followed by digital skills present in 66.1% of job ads (**Figure 9**).

By contrast, space-specific technical capabilities are less pervasive, although they remain essential to core sector activities. Systems and Mission Engineering skills are present in 51.9% of postings, while other specialised capabilities account for smaller shares, reflecting their more targeted and role-specific nature.

Within this broader pattern, demand for digital skills varies by firm type. Smaller companies show the highest incidence of digital skills in job postings, appearing in 75.0% of job ads among startups and 77.1% among SMEs, compared with 64.9% among large firms (**Figure 10**). This may reflect differences in organizational structure and workforce composition, as smaller and younger firms often require broader and more versatile profiles, while large firms tend to have a broader diversification of roles, including functions where digital competencies are less central.

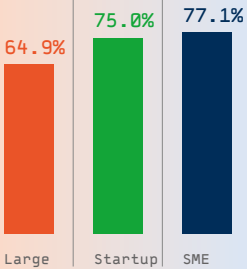
Overall, the evidence suggests that the European aerospace labour market increasingly values a combination of transversal capabilities, digital competencies and specialised engineering expertise, reinforcing the emergence of T-shaped skill profiles within the sector.

Figure 9. **Skills clusters demanded in job posts (% values, excluding N/A), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

Figure 10. **Digital skills demand by firm type (% values), 15/12/25 – 30/03/26.**

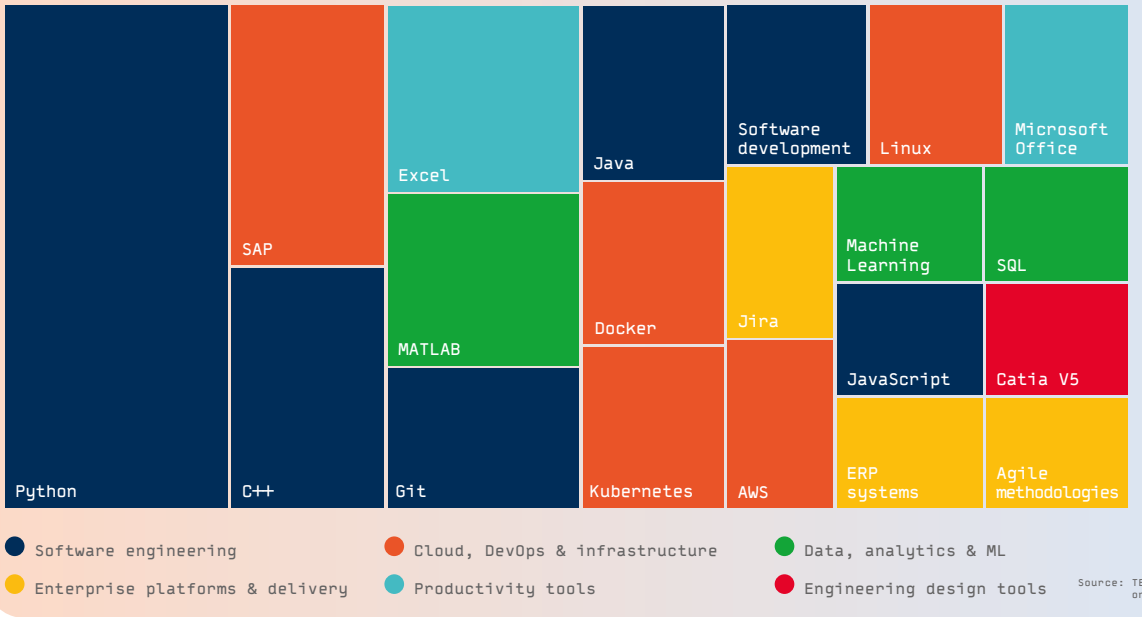


Source: TEHA Group elaboration on LinkedIn data, 2026

SOFTWARE, DATA, CLOUD AND ERP COMPETENCIES DOMINATE DIGITAL DEMAND IN THE EUROPEAN SPACE SECTOR

Digital capabilities are becoming increasingly foundational across the aerospace ecosystem, reinforcing the pattern emerged from the role distribution analysis, with digital capabilities becoming a core component of the sector's talent pool. A more granular view on the specific digital skills mentioned in job postings shows that the most in demand across the European space sector are software engineering and data-driven capabilities. Programming languages, such as Python, C++ and Java, dominate the top ranks. Notably, cloud and DevOps tools, as well as Machine Learning competencies feature prominently alongside traditional engineering software like CATIA V5, pointing to a sector that is rapidly converging around modern IT practices while still relying on domain-specific simulation and design tools.

Figure 11. **Top 20 digital & AI skills demanded in job posts (absolute values), 15/12/25 – 30/03/26.**



Source: TEHA Group elaboration on LinkedIn data, 2026

NOT ALL HIGH-DEMAND DIGITAL SKILLS ARE EQUALLY RESILIENT, WITH SOME FACING GREATER EXPOSURE TO AI-DRIVEN DISRUPTION

Despite remaining strongly requested in job postings, several digital competencies may already face growing disruption risks due to rapid advances in AI and automation.

Traditional programming (e.g., Python, C++, Java) and data analytics tools (e.g., MATLAB, SQL) may become increasingly exposed as generative AI systems expand their coding, testing, and analytical capabilities. Other domains such as Cloud & DevOps technologies (e.g., AWS, Linux, Docker, Kubernetes) and enterprise or project management tools (e.g., SAP, Jira, Agile) appear comparatively less exposed in the near term, as they continue to rely more heavily on infrastructure management, systems integration, governance, and organisational coordination. Therefore, the challenge is not simply to expand digital capabilities, but to anticipate how technological change may alter the relative value of different digital skills over time. Workforce development strategies will need to focus not only on current shortages, but also on the adaptability of the talent base as AI reshapes the boundaries between automatable technical tasks and higher-value system, integration, and decision-support functions.

Programming

- Python
- C++
- Java

Data & AI Analytics

- MATLAB
- Machine Learning
- SQL

Cloud & DevOps

- AWS
- Linux
- Docker
- Kubernetes

ERP & methodology

- SAP
- Jira
- Agile

Imminent disruption risk — Lower disruption risk

HIRING DATA CONFIRMS THE IMPORTANCE OF T-SHAPED SKILL PROFILES IN THE EUROPEAN SPACE LABOUR MARKET

Hiring demand in the European aerospace ecosystem is highly concentrated both geographically and structurally, with a strong orientation toward engineering roles. At the same time, job postings increasingly combine deep technical expertise with transversal and digital capabilities, signaling a shift toward T-shaped talent profiles. Transversal competencies appear in almost all postings (analytical and problem-solving skills in 92.5%, communication and teamwork in 90.1%), while digital and AI skills appear in 66.1% of vacancies, confirming the significant role of software-driven capabilities across the sector.

While these findings highlight how the sector's skills demand is evolving, understanding the sustainability of this talent base requires examining how engineers actually move across countries, industries and employers over their careers. To examine how this evolving skill demand translates into actual career trajectories, it is necessary to look beyond job postings.

The next chapter therefore analyses the career trajectories of aerospace engineers after graduation, exploring where they work, how talent flows across sectors and geographies, and how effectively the space ecosystem converts its educational pipeline into long-term sector employment.

Chapter 3

Talent circulation & adjacent sectors

MAPPING THE PIPELINE: WHAT HAPPENS TO EUROPE'S AEROSPACE ENGINEERS AFTER GRADUATION

Europe has a network of leading technical universities that produce a substantial pool of graduates relevant to the space sector. But what actually happens to these engineers after graduation? To address this question, TEHA developed a proprietary analytical framework based on LinkedIn profile data, enabling the reconstruction of career trajectories for a large and representative sample of European aerospace engineers. The detailed methodology is provided in Appendix B.

The analysis covers 13,764 LinkedIn profiles of individuals with an aerospace engineering educational background who graduated from 28 universities in ESA countries ranked in the QS top 100 World University Rankings for Engineering and Technology 2025 (See Appendix B). Equivalent to approximately 22% of the total full-time equivalent workforce within the European space industry (62.3k, as noted in Chapter 1), the sample carries substantial analytical weight and yields meaningful findings. It allows exploration of four dimensions of talent dynamics that typical workforce statistics cannot capture and that have not been extensively studied quantitatively.

KEY GUIDING QUESTIONS OF THE ANALYSIS

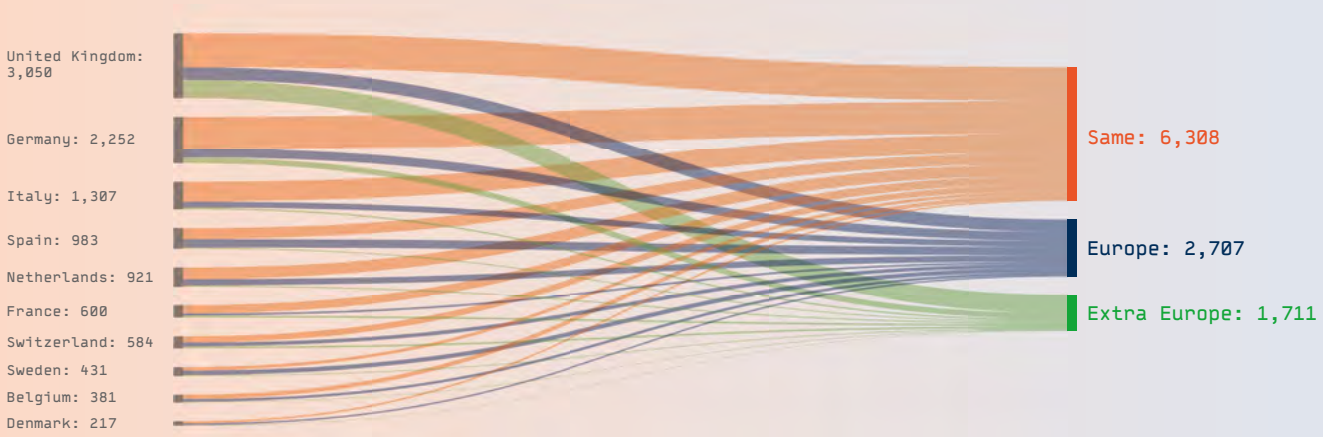
- Where do aerospace engineers currently work, and how large is the conversion gap between training and sector employment?
- What are the dynamics of career progression, and how does talent move in and out of the space sector?
- Which industries is the space sector competing with for this talent, and what are the dominant alternative destinations?
- What are the geographical patterns of talent retention and mobility across European countries, and which nations attract or lose the most engineers?

59% OF AEROSPACE ENGINEERS NOW WORK IN THE SAME COUNTRY WHERE THEY STUDIED, BUT ONE IN SIX GRADUATES TRAINED IN EUROPE IS NOW WORKING ABROAD

The engineers included in the analysis were trained at universities across 10 European countries, with the United Kingdom and Germany accounting for the largest shares of the sample, at 30.7% and 20.3%, respectively.

A comparison between country of study and current country of employment shows that most aerospace graduates remain in Europe to pursue their careers. Overall, 59% work in the same country where they studied, while 25% have moved to another European country. At the same time, the talent system remains exposed to a meaningful outflow towards non-European labour markets, with 16% of engineers trained in Europe having left the region and currently working abroad (**Figure 1**).

Figure 1. **Flows from university country to current job country (absolute values), 2026.**
Note: the chart includes 10.7k profiles, as data is missing for the others.



59%
Current job country is the same as university country

25%
Current job country is different, but still in Europe

16%
Current job country is different and outside Europe

Source: TEHA Group elaboration on LinkedIn data, 2026.

THE US EMERGES AS THE LEADING DESTINATION BEYOND EUROPE

Germany and the United Kingdom are the two most represented destinations, accounting for 20% and 17% of current employment respectively (**Figure 2**). Among the top 15 countries, the United States is the first non-European location, attracting 6% of the engineers in the sample. Other significant destinations outside Europe include India, as well as the UAE, Canada and Australia.

These patterns suggest that while Europe retains the majority of its aerospace graduates, the talent base is nonetheless internationally mobile and exposed to external pull factors.

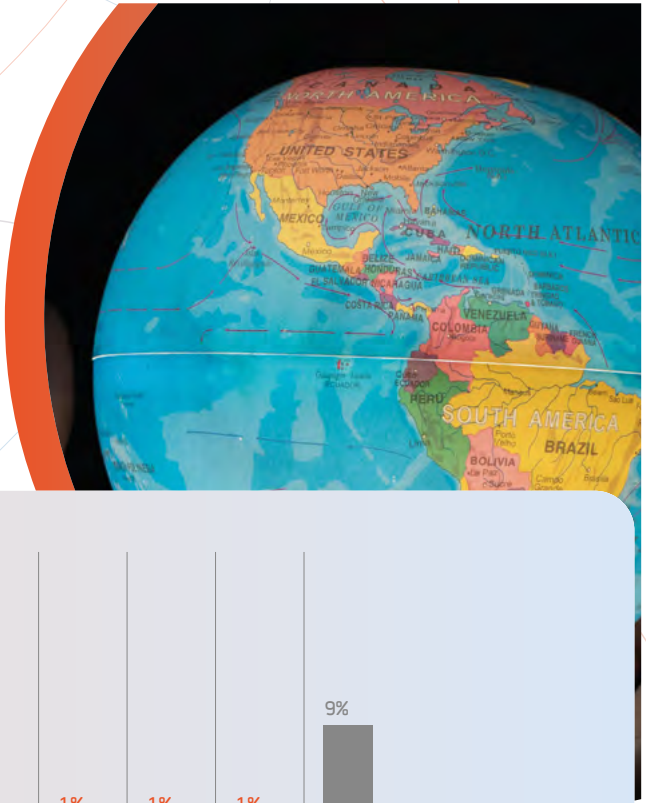
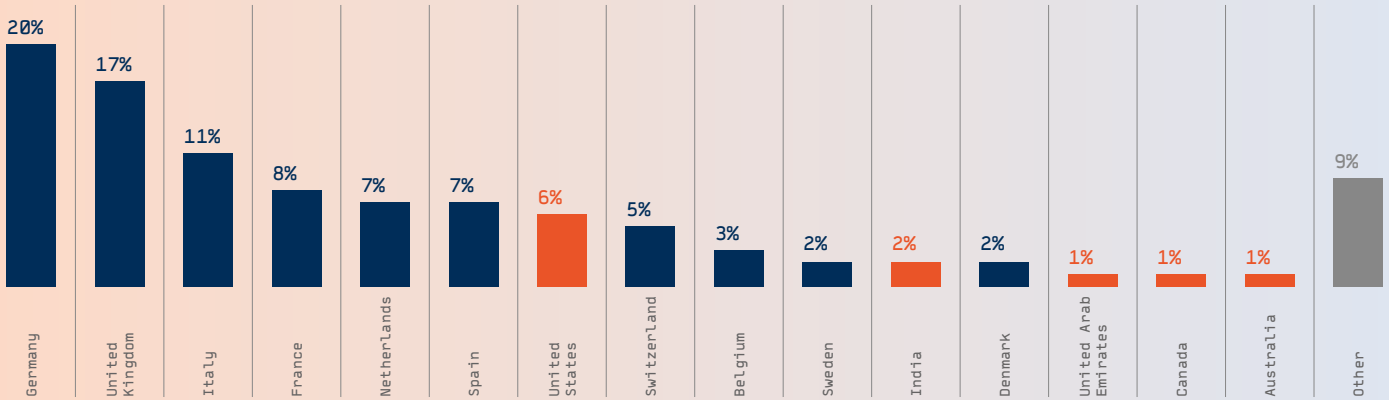
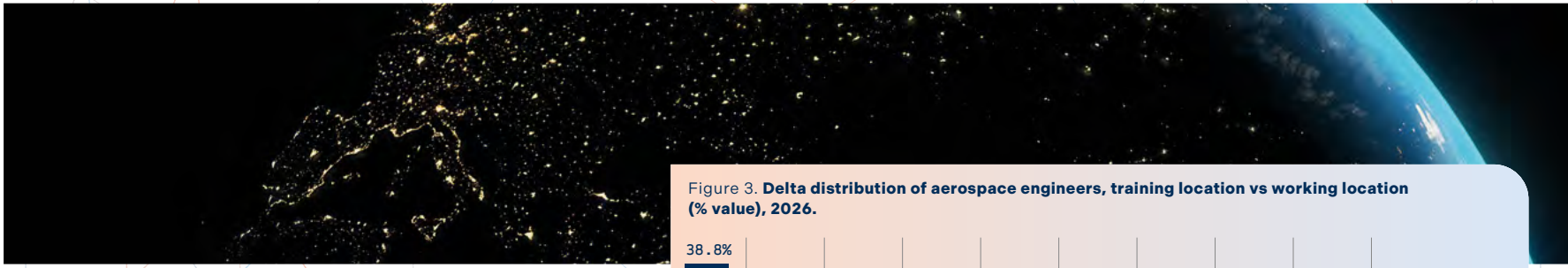


Figure 2. **Current location where aerospace profiles work (% values), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

FRANCE IS THE ONLY COUNTRY RECORDING A NET GAIN FROM INTRA-EUROPEAN TALENT MOBILITY

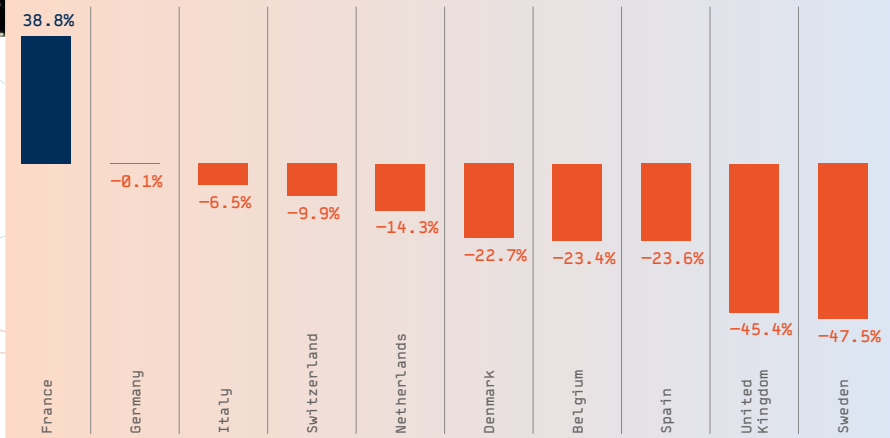


Building on the distribution of current employment, the analysis measures three related dimensions for each country to offer a nuanced view of intra-European mobility of aerospace engineers: retention of domestically trained engineers, attraction of foreign-trained engineers and the net talent balance, measured as the delta between where engineers studied and where they currently work.

On retention, Italy, Germany and France lead, each holding more than two thirds of their domestically trained engineers, with Italy recording the highest rate at 71.3%. On talent inflow, France is the most attractive country, with 52% of engineers currently working there having been educated abroad, followed by Switzerland at 39%.

Taken together, France emerges as the only country that attracts more talent than it loses (**Figure 3**), underscoring the attractiveness of its labour market, potentially linked to the concentration of major aerospace players in the country. Every other country in the analysis is a net exporter of talent. The UK stands out as one of the countries losing the most engineers, a pattern that may reflect the structural disruption to international programme integration and cross-border employment following Brexit.

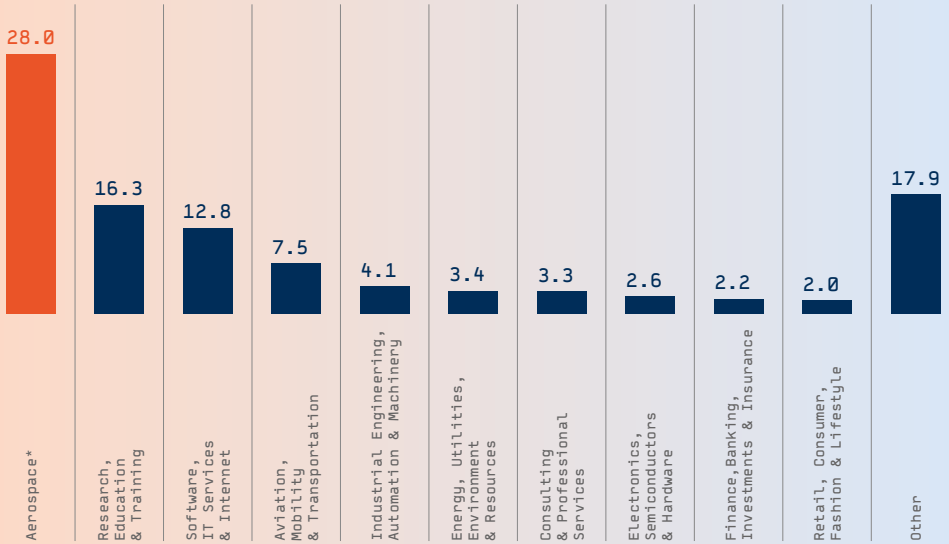
Figure 3. **Delta distribution of aerospace engineers, training location vs working location (% value), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

EUROPE'S AEROSPACE TALENT PIPELINE FACES A CONVERSION CHALLENGE: ONLY 28% OF GRADUATES WORK IN THE AEROSPACE SECTOR

Figure 4. **Current industry clusters aerospace profiles work in (% values), 2026.**



* *Defence and security are included in the aerospace definition, as many firms span both areas and cannot be classified neatly under a strict sectoral boundary*

Source: TEHA Group elaboration on LinkedIn data, 2026.

If geography shows where aerospace talent goes, sectoral distribution helps explain how effectively the space economy converts the educational pipeline into sector employment. On this front, the data highlights a critical conversion challenge: only 28% of aerospace engineering graduates in the sample currently work in the aerospace sector (**Figure 4**). The second most common destination is research, education and training, which still remains closely connected to the space economy and, more broadly, to the scientific and technological base that supports it. However, a significant share of graduates is absorbed by adjacent sectors: 12.8% work in software and IT services, and 7.5% are employed in mobility and transportation (**Figure 4**).

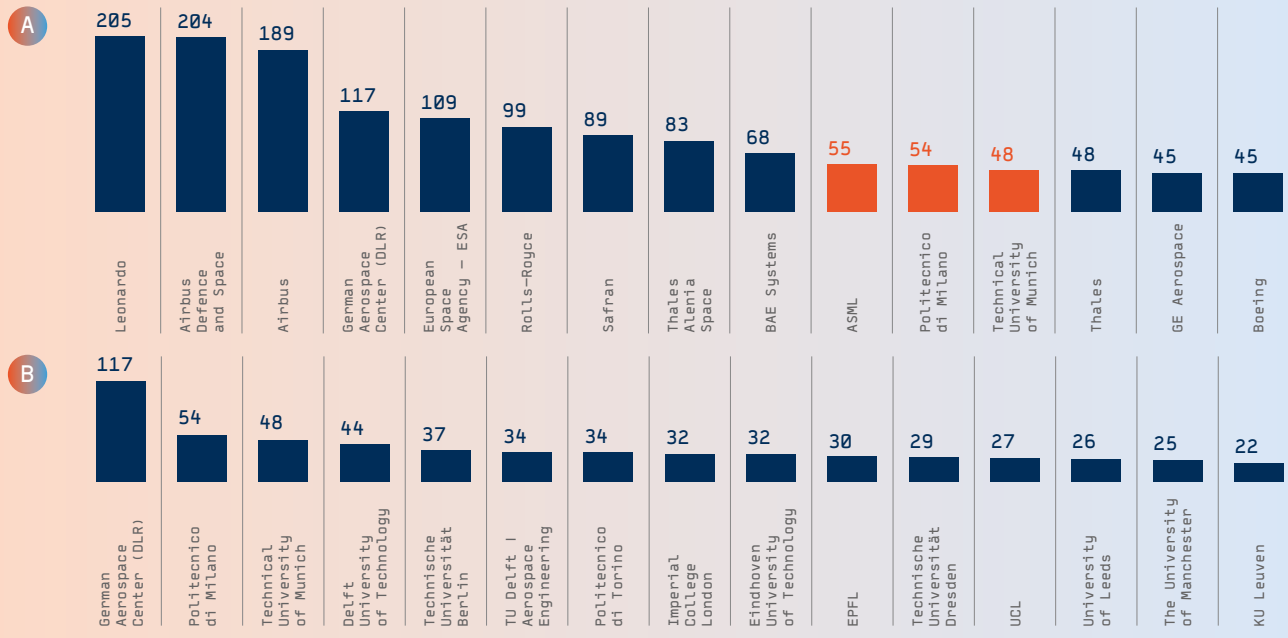
The distribution suggests that aerospace engineering skills are highly valued well beyond the sector itself but also points to a key issue: a large majority of graduates trained in aerospace ultimately build their careers elsewhere, highlighting the sector's limited ability to retain and leverage the talent pipeline emerging from European universities.

TALENT LEAKAGE OCCURS THROUGH FRAGMENTATION RATHER THAN A SINGLE COMPETING INDUSTRIAL GIANT

Despite the relatively low overall sectoral conversion rate, the leading organizations hiring aerospace talent are all in the space sector, with Leonardo and Airbus ranking first (**Figure 5A**). Aside from ASML, a semiconductor company, there is no single top-tier corporate competitor for aerospace talent, suggesting that graduates are being absorbed by a multitude of smaller players or diverse industries rather than by a few rival industrial giants.

Among research institutions and universities, the German Aerospace Center ranks first, followed by the Politecnico di Milano, which is the highest-ranked academic employer in the sample (**Figure 5B**).

Figure 5. A. **Top 15 organizations employing aerospace engineers;**
B. **Top 15 research centers and universities employing aerospace engineers (absolute values), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

FOUR PROFILE TYPES REVEAL PATTERNS OF ATTRACTION AND RETENTION ACROSS THE SPACE SECTOR

To move beyond a static snapshot and better understand the dynamics behind talent mobility, all profiles were clustered into four categories based on their full career trajectories:

Loyalists: People who worked only in the space sector throughout their careers

Entrants*: People who currently work in space but previously worked outside the sector

Leavers: People who previously worked in space but currently work outside the sector

Avoidants: People who have never worked in the space sector**

Profiles with space experience

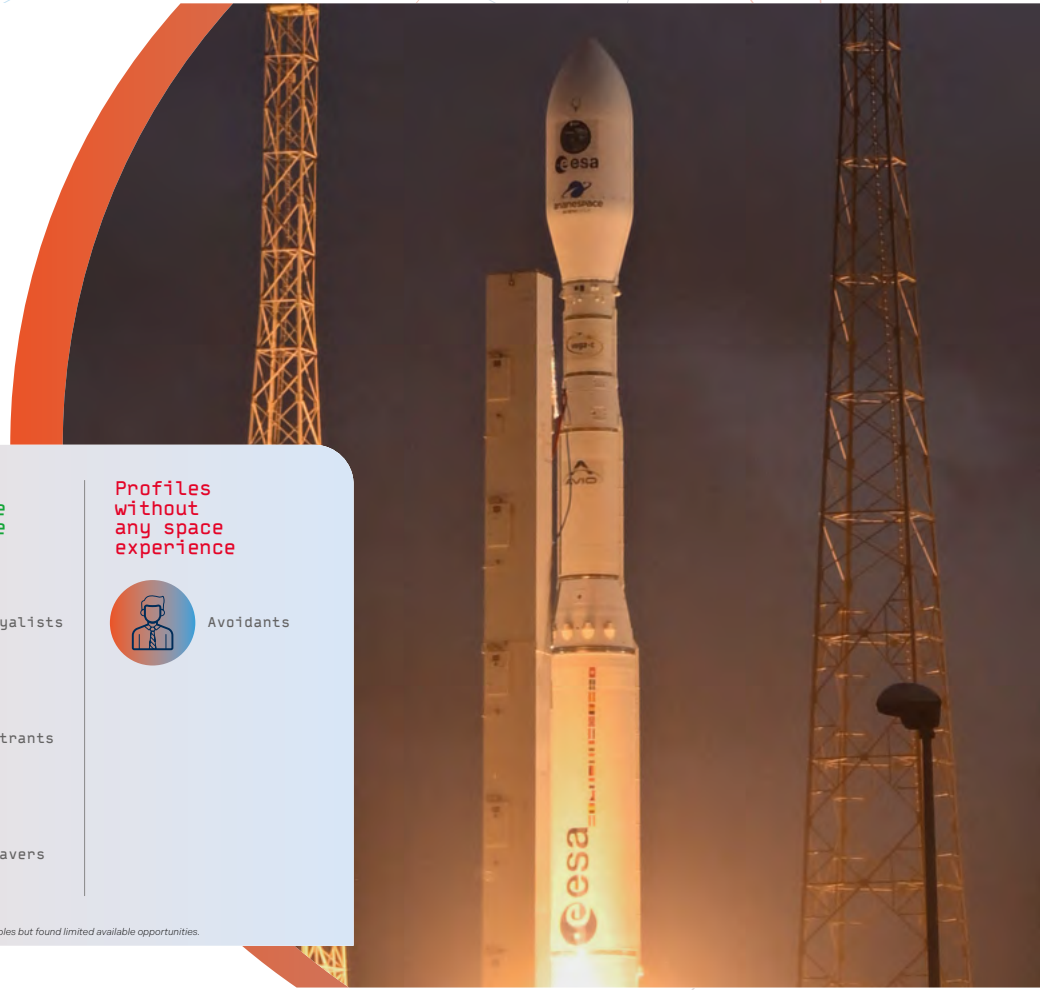
- Loyalists
- Entrants
- Leavers

Profiles without any space experience

- Avoidants

* including those returning to the space sector after experience in another industry

** The label "avoidants" describes career outcome, not necessarily intent; some in this group may have sought space sector roles but found limited available opportunities.



44.3% OF AEROSPACE ENGINEERS HAVE NEVER WORKED IN THE SPACE INDUSTRY AND 27.7% HAVE LEFT THE SECTOR, SUGGESTING WEAK LONG-TERM RETENTION

This classification reveals that the space sector captures only part of the broader aerospace engineering talent pool over the course of their careers. A large share of the sample, 44.3%, has never worked in the space industry (Avoidants) (**Figure 6**), whether by preference, circumstance, or lack of accessible opportunities. One possible contributing factor lies in the structure of hiring demand documented in Chapter 2, where mid-senior roles account for 48.2% of job postings and entry-level positions just 30.5%. This orientation toward experienced candidates may leave relatively few accessible pathways for graduates seeking their first role in space, suggesting that behind the 44% figure there may be a lack of opportunity as much as a lack of interest. Among the remaining 55.7% who have had at least one professional experience in the sector, only a small minority can be considered Loyalists: just 4.9% have spent their entire careers in space. This suggests that long-term retention within the sector is the exception rather than the norm.

Instead, the data points to a much more permeable talent boundary. On the one hand, 23.1% of the total sample joined the space sector after starting their careers in other industries (Entrants). On the other hand, 27.7% began in space but subsequently moved out of the sector (Leavers). These patterns indicate that the space industry is embedded in a broader talent market in which inflows and outflows are both significant.

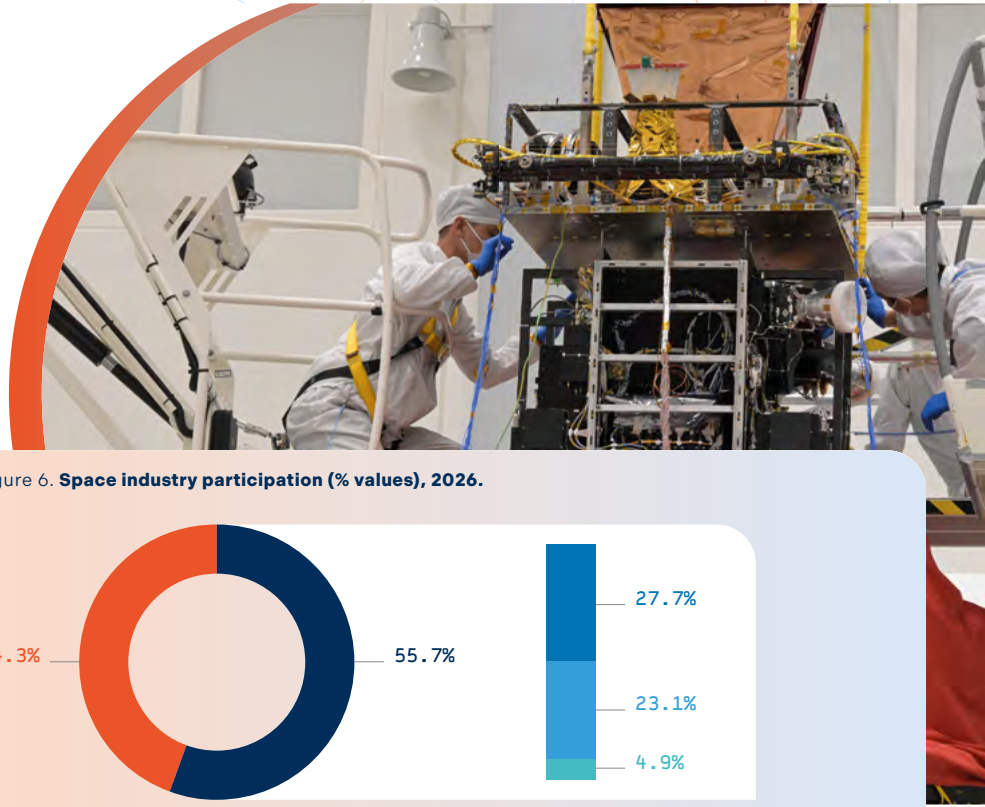


Figure 6. **Space industry participation (% values), 2026.**

Source: TEHA Group elaboration on LinkedIn data, 2026.

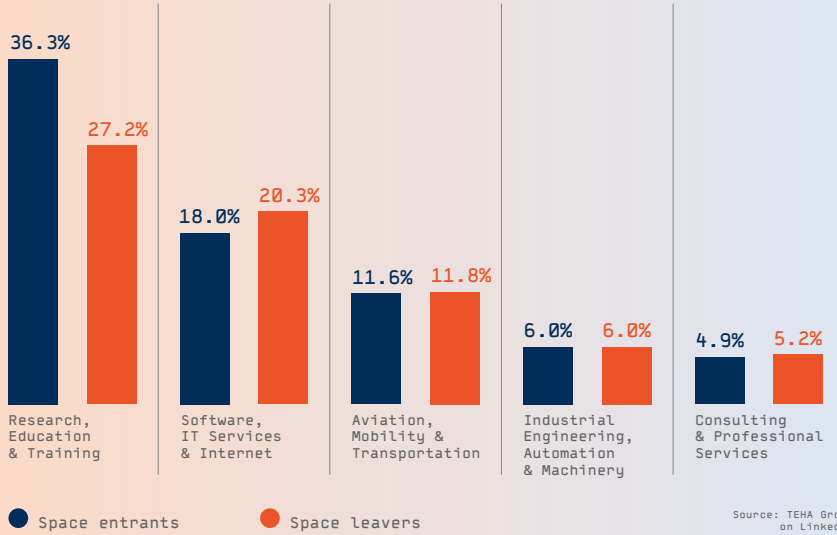
AEROSPACE ENGINEERS MOVE BETWEEN FIVE MAIN INDUSTRIES THROUGHOUT THEIR CAREERS: RESEARCH, SOFTWARE, MOBILITY, INDUSTRIAL ENGINEERING AND CONSULTING

Across both *Entrants* and *Leavers*, the same five sectors appear with consistency, and in remarkably similar proportions. Research, education and training is the dominant transit point in both directions, accounting for around 30% in each group (**Figure 7**), reflecting the role of academia and research as a staging ground for aerospace careers.

The second most common sector is software and IT services, at around 20%, followed by mobility, industrial engineering and consulting.

The symmetry across *Entrants* and *Leavers* points to strong skill transferability and suggests that the space sector is part of a broader interconnected talent ecosystem.

Figure 7. **Top 5 industry clusters aerospace profiles moved into and out of, (% values), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

AEROSPACE GRADUATES WHO NEVER ENTER THE SPACE SECTOR DISPERSE ACROSS A BROAD SET OF INDUSTRIES AND COMPANIES

Shifting the focus to *Avoidants*, engineers who have never entered the space sector, adds a further dimension to this picture. One in three of those who never entered the space sector began their professional path in research, education and training (**Figure 8**). Beyond that, the most frequent destinations are mobility, ICT and industrial engineering, thus reflecting patterns similar to those observed for *Entrants* and *Leavers*.

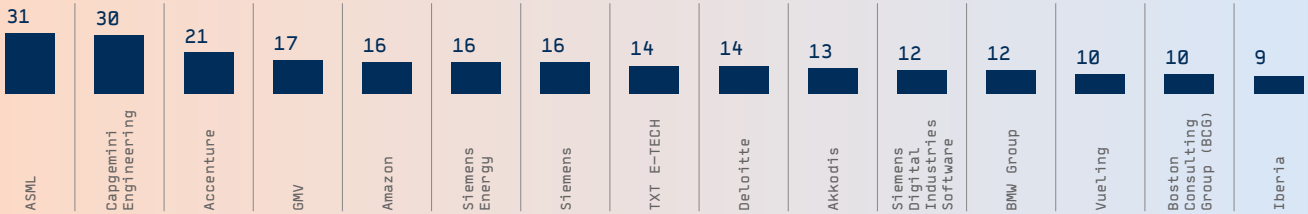
The distribution across current employers appears fragmented, with talent spread across several firms with no dominating giants. Nonetheless, the top 15 employers are all large and leading companies in their respective fields. Notably, consulting firms account for a relatively significant presence within this group, with 4 companies appearing among the top 15 (**Figure 9**).

These patterns reinforce the breadth of alternative career paths available to aerospace graduates and the ecosystemic role of the space sector in talent development.

Figure 8. **Current industry clusters *Avoidants* profiles started to work in (% values), 2026.**

Source: TEHA Group elaboration on LinkedIn data, 2026.

Figure 9. **Top 15 current company *Avoidants* profiles work in (% values), 2026.**



Source: TEHA Group elaboration on LinkedIn data, 2026.

THE CHALLENGE FOR EUROPE IS CONVERTING AND RETAINING AEROSPACE TALENT WITHIN THE SPACE SECTOR

The analysis of aerospace graduates' career trajectories points to a system that faces challenges in ensuring stable and sustained absorption into the space sector.

Most graduates remain in Europe, but this geographic retention does not translate into sectoral retention. Only a minority of aerospace-trained engineers work in the aerospace sector (28%), very few remain there throughout their careers (5%), and cross-sector mobility is substantial and persistent.

The findings indicate that aerospace talent is highly portable and valued across multiple adjacent industries. Aerospace engineers' capabilities are readily absorbed by a wide range of knowledge-intensive and technology-driven sectors. The strategic challenge for the European aerospace industry is therefore to strengthen its capacity not only to attract talent, but also to convert and retain it over time.

Chapter 4

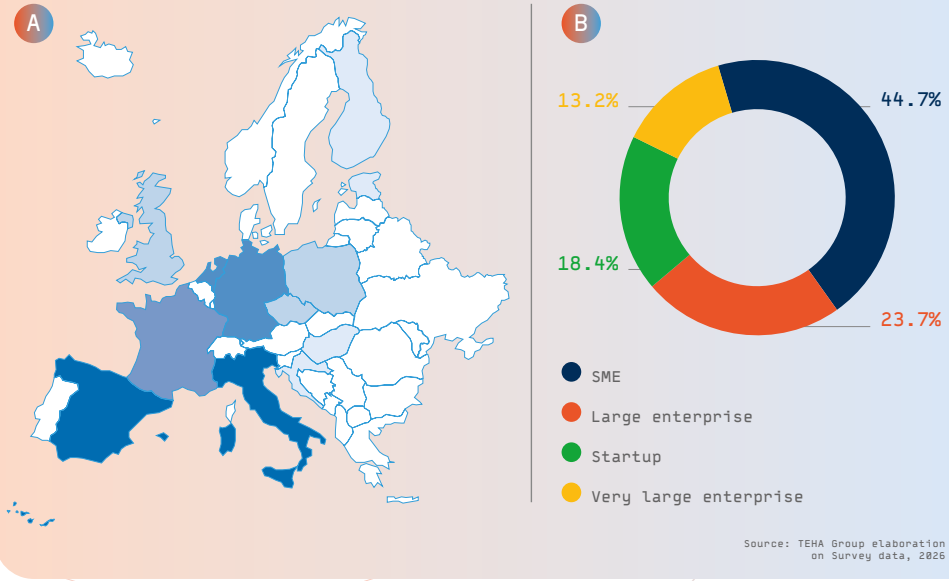
The voice of the European space ecosystem

SURVEY EVIDENCE PROVIDES QUALITATIVE INSIGHTS INTO FUTURE SKILLS REQUIREMENTS AND TALENT GAPS IN THE EUROPEAN SPACE SECTOR

To complement the evidence emerging from the quantitative analysis with a more qualitative perspective, a survey was conducted among key actors across the European space ecosystem, including C-level executives (CEOs, CTOs, CIOs, COOs), Heads of Human Resources, Heads of Engineering, and other professionals directly involved in workforce planning and skills development. The objective was to assess perceptions of future workforce skill requirements, sectoral competition for talent, barriers to the adoption of emerging technologies, and approaches to mitigating skills gaps.

By gathering the views of professionals directly engaged in the sector and observing these dynamics first-hand, the survey offers valuable insight into current shortages, future talent needs, and the skills that will shape competitiveness in the years ahead. The analysis covered 40 professionals across several European countries, with a strong concentration in Spain, Italy, Germany, and the Netherlands, and around half of the sample consists of respondents working in SMEs within the space sector (**Figure 1**).

Figure 1. **Geographical distribution (% of respondents), 2026 (A, above). Role within the company (% of respondents), 2026 (B, below).**

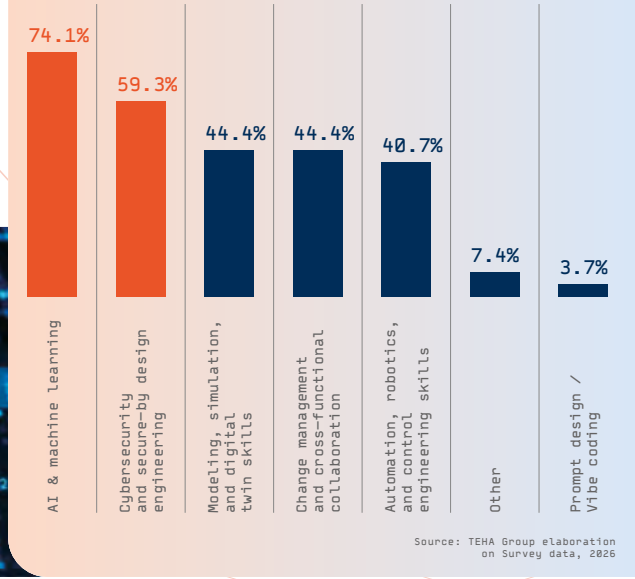


AI AND CYBERSECURITY STAND OUT AS THE MOST STRATEGIC SKILLS FOR COMPETITIVENESS BY 2030

AI and rapid technological change are reshaping how engineering work is done. In this context, core engineering fundamentals remain essential, yet they increasingly need to be complemented by AI integration, and the ability to work effectively with data and automated systems. AI-related capabilities were identified by 74.1% of respondents as critical for maintaining competitiveness, followed by cybersecurity and security-by-design engineering competences, cited by 59.3%. At the same time, digital twin and change management are also seen as important for integrating and leveraging new technologies by 2030, although they were mentioned by a smaller share of respondents, equal to 44.4% for both.

By contrast, skills often associated with more speculative future job trends, such as prompt design or vibe coding, are still perceived as distant and non-essential in the near term, being highlighted by only 3.7% of respondents (**Figure 2**).

Figure 2. **Skills needed to integrate and exploit new technologies and remain competitive by 2030 (% of respondents), 2026.**



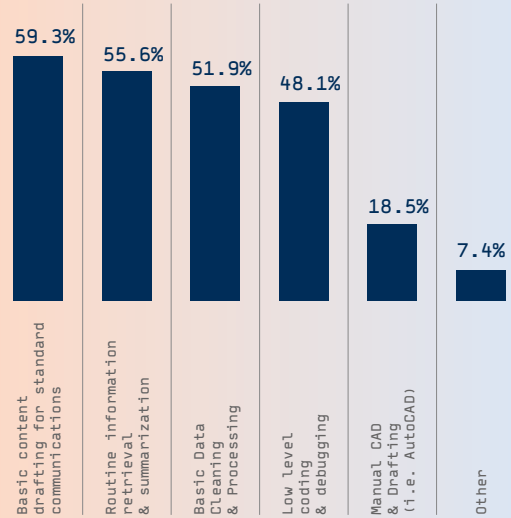
Source: TEHA Group elaboration on Survey data, 2026

TECHNOLOGICAL TRANSFORMATION WILL MAKE MANY ROUTINE, REPETITIVE TASKS INCREASINGLY OBSOLETE

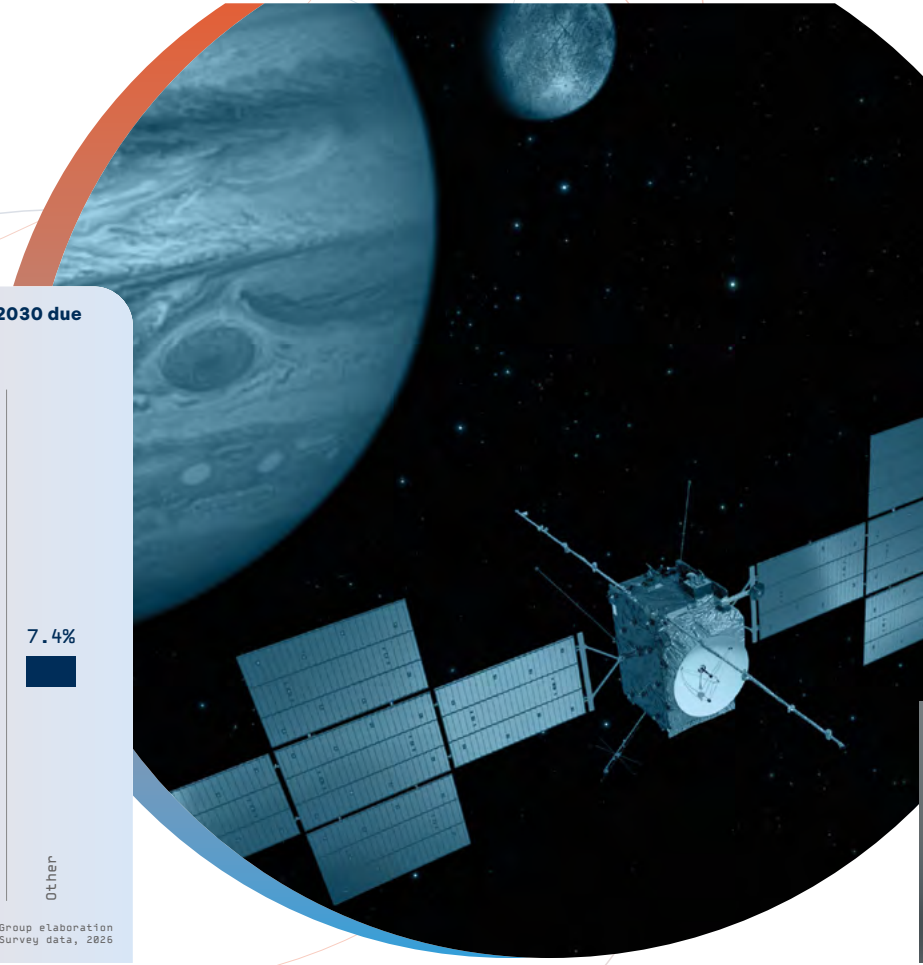
The effects of technological transformation are not limited to the emergence of new skill requirements, tasks, and activities. In the space sector, in particular, respondents expect AI and other emerging technologies to progressively replace a range of routine and repetitive activities that can be performed more efficiently by automated systems.

By 2030, AI will be able to outperform humans in basic content drafting, information retrieval and summarization according to 59.3% and 55.6% of respondents, respectively. In parallel, around 50% believe that low-level coding and data cleaning will also be supplanted by AI technologies. These findings point to a growing shift in human contribution away from execution-oriented tasks and towards higher-value activities, such as problem framing, critical decision-making and the integration of technical knowledge with strategic judgement. (**Figure 3**).

Figure 3. **Skills most likely to be outdated by 2030 due to automation and digital transformation (% of respondents), 2026.**



Source: TEHA Group elaboration on Survey data, 2026



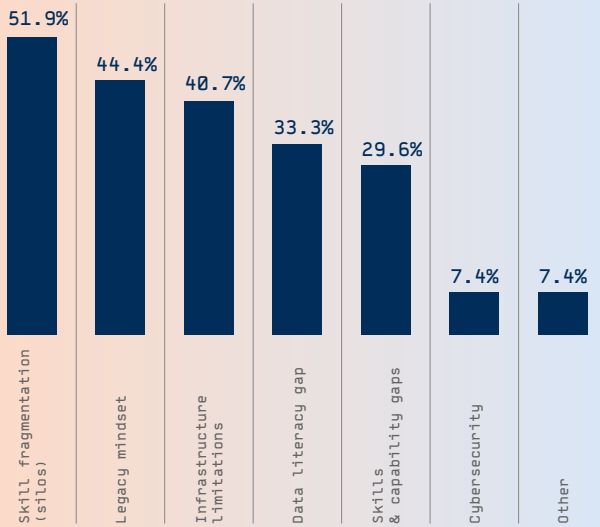
THERE IS A CLEAR ORGANIZATIONAL READINESS GAP, ACROSS PEOPLE AND CAPABILITIES, PREVENTING THE ADOPTION OF AI AND EMERGING TECHNOLOGIES

The impact of technological change on the workforce, both in terms of new skill requirements and shortages, and in terms of the obsolescence of existing skills, is widely expected to intensify in the coming years. In this context, companies' ability to anticipate and manage these changes will be a critical lever of competitiveness in the space sector. At the same time, the pace and depth of transformation will depend not only on the technologies themselves, but also on whether organisations are able to create the conditions necessary to adopt and scale them effectively.

Survey results suggest that many companies in the space sector are not yet fully prepared for this transition. Respondents highlight several structural barriers that continue to constrain technology adoption at the organisational level. Three challenges emerged as particularly significant. The first is skill fragmentation, identified by 51.9% of respondents. The second is organisational culture, with 44.4% of companies referring to legacy mindsets as a barrier to change. The third is infrastructure limitations, cited by 40.7% of respondents, suggesting that technological ambition is often not matched by the systems and tools needed to support implementation (**Figure 4**).

These findings point to a clear organisational readiness gap across people, culture, and infrastructure. Addressing these barriers will be essential not only to enable the adoption of AI and emerging technologies, but also to ensure that companies can translate technological change into sustained competitive advantage.

Figure 4. **Primary barriers preventing the workforce from fully adopting AI and emerging technologies (% of respondents), 2026.**



Source: TEHA Group elaboration on Survey data, 2026

THE ADJACENT SECTORS COMPETING FOR TALENT WITH SPACE ARE MAINLY MOBILITY AND NON-SPACE DEFENCE PROGRAMS

As digitalisation accelerates, roles in the space sector are becoming increasingly software, data, and AI-intensive, and are defined more by transferable digital skills than by sector-specific expertise. As a result, space employers increasingly compete head-to-head for the same profiles with organizations in adjacent sectors, particularly defence and security, automotive and mobility, as well as AI and tech companies.

When asked about adjacent sectors competing with space for talent, with defence and security considered as a separate category given its significance, respondents identified defence and security and automotive and mobility as the main competing sectors, mentioned by 55.6% and 44.4% of respondents, respectively. These are followed by other key technology-intensive industries, including AI and machine learning companies and big tech and software firms (**Figure 5**).

The intensity of this competition appears to be driven not only by the overlap in skill requirements, but also by the comparative attractiveness of these sectors. Adjacent sectors often offer higher pay, stronger tooling, and clearer entry routes and career progression.

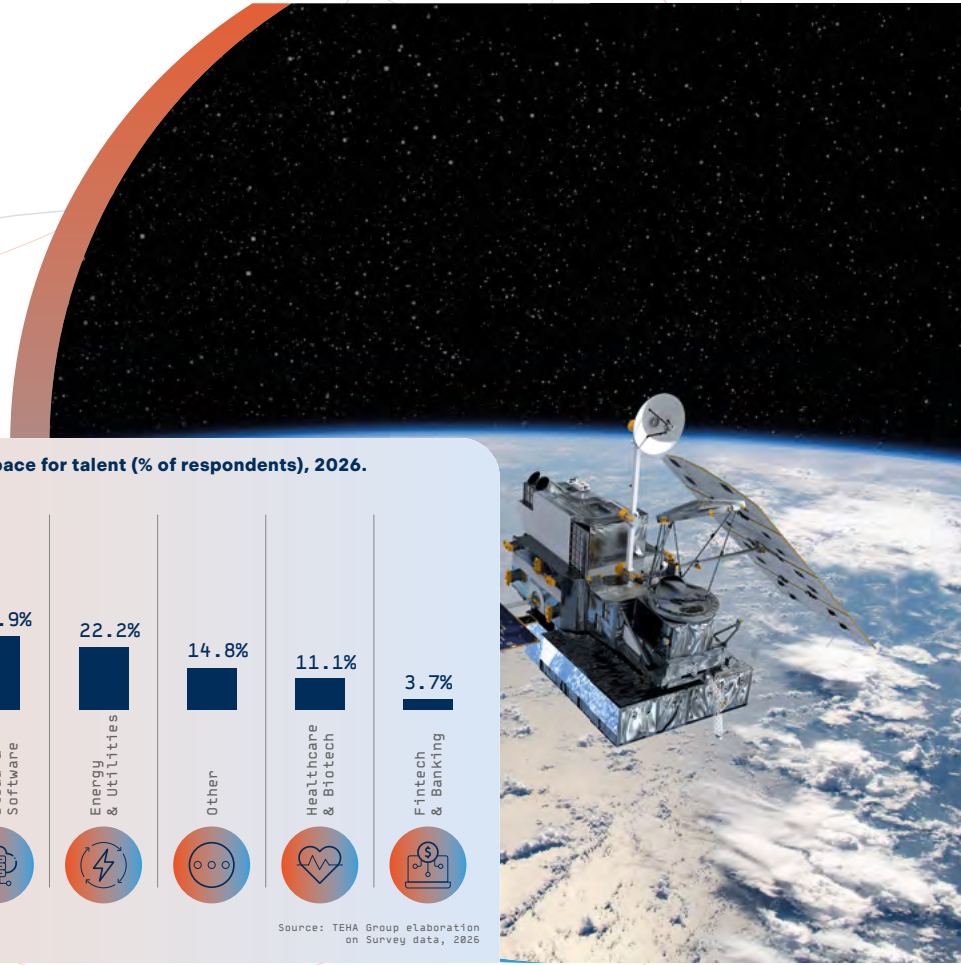
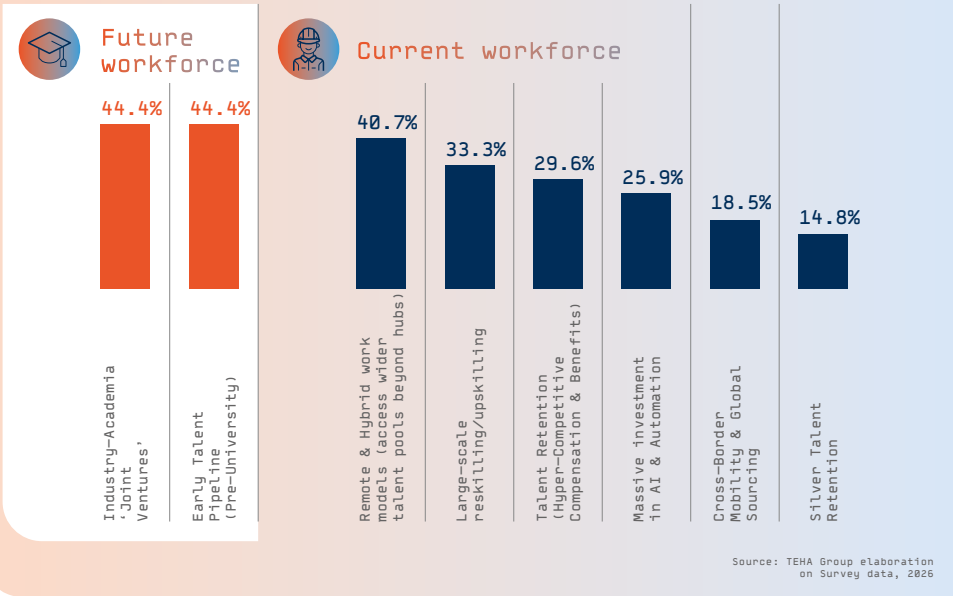


Figure 5. **Main sectors competing with Space for talent (% of respondents), 2026.**

Source: TEHA Group elaboration on Survey data, 2026

SKILLS SHORTAGE MITIGATION STRATEGIES MAINLY RELY ON TALENT DEVELOPMENT RATHER THAN CURRENT WORKFORCE RESKILLING AND RETENTION

Figure 6. **Most effective strategies to counter the growing skills shortage and shifting demographics (% of respondents), 2026.**



Source: TEHA Group elaboration on Survey data, 2026

In a context of rapid and continuous change in both skill requirements and occupational profiles, and with the existing workforce expected to remain the backbone of the sector's talent base for years to come, a clear strategic implication emerged across several confidential meetings and working groups: hiring alone will not be sufficient to close widening skills gaps or meet future workforce needs.

Against this backdrop, it is notable that the strategies considered most effective by C-level respondents across the space industry are primarily focused on developing future talent rather than strengthening the current workforce. Around half of respondents identified industry–academia joint ventures (44.4%) as the most effective response, followed by early talent pipeline initiatives at pre-university level (44.4%). By contrast, measures aimed at the existing workforce, such as retention policies and reskilling or upskilling initiatives, were seen as less effective and were mentioned by a smaller share of respondents. Remote and hybrid work models were cited by 40.7%, while large-scale reskilling and upskilling initiatives were identified by 33.3% (**Figure 6**).

QUALITATIVE SURVEY EVIDENCE PROVIDES ADDITIONAL INSIGHTS TO SUPPORT AND STRENGTHEN THE QUANTITATIVE ANALYSIS FINDINGS

The qualitative evidence adds an important layer of insight and reinforces the main findings emerging from the quantitative analysis.

First, it confirms the growing importance of AI and digital skills as strategic capabilities for maintaining competitiveness in the space sector. In particular, these competences are increasingly seen not as optional complements, but as core enablers of future competitiveness.

Second, the survey confirms that the adjacent sectors competing most directly with space for talent are those already identified in the broader market evidence, namely non-space defence, mobility, and technology-intensive industries.

Third, the survey provides additional evidence on the organisational barriers that continue to limit companies' ability to adopt and fully exploit emerging technologies, highlighting how organisational structure, culture, capability fragmentation, and infrastructure remain central obstacles to technological transformation.

Finally, the results provide a new perspective on the strategies for addressing talent shortages. While upskilling and reskilling are likely to become critical levers of competitiveness in a context where fewer people will enter the workforce and employees will remain active for longer, survey results suggest that these measures are not yet regarded as the most effective response to current skills shortages compared to initiatives focused on developing the future workforce. This suggests that, although the importance of strengthening the current workforce is widely recognised, organisational strategies still remain more oriented towards building new talent pipelines than towards systematically transforming the talent already in place.

Chapter 5

ESA Future Skills Executive Roundtable

THE WAY FORWARD, TOWARD A COORDINATED EUROPEAN SKILLS STRATEGY

The findings and evidence gathered across the report were presented at the "**ESA Future Skills Executive Roundtable: Preparing the Human Capital of Tomorrow"**, held on April 8th 2026 at ESA headquarters. The event was organized as part of the ESA Skills Digital Twin Initiative, launched by the European Space Agency in collaboration with TEHA Group. The roundtable brought together 25 high-level stakeholders involved in talent development from industry, academia and international organizations, to discuss how the European space sector can respond to rapidly evolving skills needs.

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The Roundtable was structured as an open discussion on skills needs and systemic gaps, with participants invited to react to the key findings of the research through their experience, in particular discussing future competencies and talent circulation.

Building on the evidence generated throughout the initiative, the discussion offered cross-cutting perspectives on the most pressing issues. This chapter explores in depth the eight key messages that emerged from the exchange, which together provide the foundation for further investigation and analysis.

RETHINKING PROFILES AND THE FORMATIVE PIPELINE FOR A FAST-EVOLVING SECTOR

1. **The space sector will need more T-shaped professionals with strong transversal capabilities**. Future space professionals will increasingly need to combine hard technical skills with a broader set of transversal capabilities, critical thinking, problem-solving, adaptability, project management, and communication. Purely technical, vertical profiles are not sufficient in environments characterized by growing complexity, uncertainty and rapid technological change. In preparation of future challenges, the sector needs are T-shaped profiles capable of working across functions and disciplines. The challenge is that this shift is not yet reflected in how organizations hire, train, or structure themselves. Transversal skills remain hard to be thoroughly assessed, are rarely part of traditional curricula, and most companies focus their recruitment on narrow specializations. Resolving these tensions requires deliberate action at the organizational level, not only at the level of education.

2. **Building the capacity to learn and adapt should be a priority across the education pipeline**. Universities should prepare the talents of the future considering a number of elements beyond today's industry demand. In a landscape changing at this fast pace, curricula designed around today's requirements risk becoming obsolete by the time graduates enter the workforce. Instead, the priority, not only at university level but starting earlier in the education pipeline, should be building the foundational capacity to learn and adapt: critical thinking, learning agility, navigating uncertainty, and systems thinking.

3. **Hiring and career development should better reflect the skills profiles the sector needs**. There is a mismatch between the T-shaped profiles the sector needs and the way most hiring is still conducted, with job postings focused on formal qualifications, degree titles and narrow technical criteria. Overly rigid requirements may unnecessarily narrow the talent pool, filtering out potential candidates from adjacent sectors or with other backgrounds. A shift towards skills-based hiring, where demonstrated competencies take precedence over credentials, would improve the quality and diversity of recruitment outcomes, while also opening up the sector to a broader range of talent. The same logic applies internally, where rigid role definitions and limited internal mobility may constrain the development of T-shaped profiles.

RETAINING, DEVELOPING, AND ATTRACTING TALENT IN A GLOBAL, CROSS-SECTOR MARKET

4. **Artificial intelligence is both a disruptive force and a potential enabler.** The pace of technological change, and in particular the rise of AI, adds urgency and complexity to the skills agenda. On the one hand, some technical skills in high demand today may be significantly automated within a few years. Investments should therefore not focus on narrowly defined profiles that risk becoming obsolete, but rather on strengthening the foundational skills and adaptability to allow professionals to evolve alongside technological change. On the other hand, AI and digital tools can themselves be deployed to accelerate training design, personalise upskilling pathways, and allow the sector to respond more dynamically to evolving talent needs.

5. **The space sector will need stronger professional and cultural value propositions to compete for talent.** The space sector is competing with technology, AI, automotive, energy, and finance companies for the same profiles. Compensation disparities affect the relative attractiveness of one sector compared to another, particularly for early-career professionals. However, beside salary, talent mobility is also shaped by factors, such as organizational culture, working conditions, clear career progression and a sense of purpose and impact. Talent circulation across sectors should be encouraged as it can facilitate knowledge transfer, cross-fertilization, while also enabling the space sector to attract talent from adjacent industries. The challenge in fostering cross-sectors' mobility lies in creating the conditions that make the sector attractive financially, but also professionally and culturally. This includes changes in leadership culture to foster an environment where employees feel empowered to contribute, question, and collaborate cross-functionally, thereby strengthening the transversal capabilities the sector needs.

6. **Reskilling and upskilling are strategic priorities to ensure workforce resilience.** Reskilling and upskilling are critical levers for sustaining the space workforce in the face of technological change and evolving industry needs. The challenge is not limited to attracting new talent but also ensuring the existing workforce can adapt as roles and skill requirements evolve over time. However, a vast majority of adults and mid-career professionals currently do not participate in upskilling and reskilling opportunities even when available. Efforts are needed to design effective initiatives that encourage employees to continuously learn.

OVERCOMING STRUCTURAL BOTTLENECKS THROUGH COORDINATED, SYSTEM-LEVEL RESPONSES

7. **The sector is currently facing a structural bottleneck at the graduate entry level.** There is a clear imbalance between the large number of aspiring candidates and the limited capacity of the industry to absorb them, as shown by organizations receiving hundreds of applications for a single position. Workforce expansion is often constrained by the high costs and significant human resource demands associated with mentoring. As a result, many organizations, particularly small and medium-sized enterprises (SMEs), struggle to provide the level of training required for new graduates. This bottleneck likely explains a substantial share of the 44% "avoidance" rate, indicating that many graduates are not actively choosing not to enter the sector, but are instead hindered by a lack of accessible entry-level opportunities and practical training pathways.

8. **Systemic issues require coordinated, systemic responses.** This set of challenges identified across the discussion are interconnected and cannot be solved by any single company, university, or institution acting alone. Fragmented, parallel initiatives across companies and countries are already underway, but without coordination they risk to be inefficient and have a limited impact. What is needed is structured collaboration to align on shared standards, pool practices and translate analysis into action.

A BEGINNING, NOT AN END: AN ONGOING COMMITMENT BEYOND THE ROUNDTABLE

The ESA Future Skills Executive Roundtable was not conceived as a one-time event, but represents the starting point of a broader, longer-term journey. The European Space Agency is positioned to lead a sustained effort to keep dialogue and collaboration alive across the European space ecosystem on the question of future skills. The convergence of evidence, experience, and strategic intent that characterised the session confirmed the relevance of the skills agenda and the appetite of the European space community to engage with it seriously.

As human capital becomes increasingly central to Europe's competitiveness, autonomy, and ability to deliver on its space ambitions, a structured and continuous engagement among all stakeholders will be essential to translate today's reflections into tomorrow's results.

Appendix

APPENDIX A: METHODOLOGICAL NOTE ON THE ANALYSIS OF SPACE LABOUR DEMAND (JOB POSTINGS)

The analysis of the labour demand in the European space sector was conducted on a sample made of 50 space companies. The scope of the analysis was limited to space-sector organizations, excluding entities in adjacent sectors, to maintain a clear and consistent focus on the space ecosystem. The sample was built to ensure both geographical coverage across ESA Member States and a balanced representation of different company sizes and stages of development. In building the sample, the Study also drew on established reference analyses, such as ESPI's *Talent in the European Space Sector* report, to ensure consistency with the broader European literature.

The companies in the sample were classified into three clusters:

- Large enterprises: established leading companies with more than 500 employees;
- Small and medium enterprises (SMEs): companies with fewer than 500 employees and an established operating history (more than 10 years old);
- Startups: recently established space companies, founded after 2015 (up to 10 years old), whose classification was validated case-by-case through a review of publicly available information and recognised industry sources.

List of organizations included in the sample:

	Organization	HQ Country	Classification
1	AAC Clyde Space	Sweden	SME
2	Admatis	Hungary	SME
3	Aerospacelab	Belgium	Startup
4	Airbus	France	Large
5	ALL.SPACE	UK	SME
6	ArianeGroup	France	Large
7	ARIANESPACE	France	Large
8	AVIO	Italy	Large
9	Beyond Gravity	Switzerland	Large
10	blackshark.ai	Austria	Startup
11	D-Orbit	Italy	SME
12	EnduroSat	Bulgaria	Startup
13	ENPULSION	Austria	Startup
14	European Space Agency – ESA	France	Large
15	Eutelsat	France	Large
16	Eventech	Latvia	SME
17	Exolaunch	Germany	SME
18	GKN Aerospace	UK	Large
19	GMV	Spain	Large
20	Golbriak Space OÜ	Estonia	Startup
21	HyImpulse	Germany	Startup
22	ICEYE	Finland	Startup
23	Indra Espacio S.A.	Spain	Large
24	Isar Aerospace	Germany	Startup
25	ISISPACE Group	Netherlands	SME

	Organization	HQ Country	Classification
26	Kongsberg NanoAvionics	Lithuania	SME
27	Latitude	France	Startup
28	Leonardo	Italy	Large
29	MBRYONICS	Ireland	SME
30	OHB SE	Germany	Large
31	Open Cosmos	UK	Startup
32	Orbex	UK	Startup
33	PLD Space	Spain	SME
34	QinetiQ	UK	Large
35	Quadsat	Denmark	Startup
36	Rocket Factory Augsburg – RFA	Germany	Startup
37	Saab	Sweden	Large
38	Safran	France	Large
39	Serco	UK	Large
40	SES Satellites	Luxembourg	Large
41	Sinergise	Slovenia	SME
42	SOLSTORM	Norway	Startup
43	Space Individuals	Austria	Startup
44	Spacemanic	Czechia	Startup
45	SSC Space	Sweden	Large
46	Surrey Satellite Technology Ltd (SSTL)	UK	Large
47	SwissTo12	Switzerland	SME
48	Telespazio	Italy	Large
49	Thales Alenia Space	France	Large
50	TRL Space	Czechia	SME

The analysis relied on a proprietary LinkedIn-based tool, designed specifically for this Study, which combines web scraping techniques and Natural Language Processing (NLP) to collect, structure and analyse job-posting data. The analysis did not consider only the headquarters country of each company. Instead, it included all job postings published in Europe by the selected companies, allowing the study to capture the increasingly pan-European character of recruitment strategies and the cross-border operational footprint of many companies, especially large enterprises.

The Study also recognises a number of methodological limitations. First, not all companies rely on LinkedIn as their sole recruitment channel, some publish vacancies also on their own corporate websites or on other specialised job platforms. Second, the number of job postings does not necessarily correspond one-to-one with the number of open positions, since a single posting may refer to multiple hires. Third, the instrument design does not allow for comparisons with previous years, nor with other sectors, given the absence of equivalent historical databases built with the same methodology and scope. Nonetheless, LinkedIn represents a robust and standardised proxy for analysing labour demand across a heterogeneous set of organisations, and provides a sufficiently broad and comparable basis for identifying hiring patterns and emerging skills needs across the European space ecosystem. Future research could usefully extend this approach by enlarging the company perimeter to adjacent sectors, lengthening the observation window, and developing comparable datasets to support cross-sectoral and time-series analysis.

APPENDIX B: METHODOLOGICAL NOTE ON THE ANALYSIS OF AEROSPACE GRADUATES' CAREER TRAJECTORIES (PROFILES)

The target population of the analysis was defined as graduates with an aerospace engineering degree from a leading European university located in an ESA member state. University selection was based on the QS World University Rankings 2025 for Engineering and Technology.

All universities ranked in the QS Top 100 and located in one of ESA member states were included. This produced a list of 28 universities across 10 countries: Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom.

List of universities included in the sample:

QS WORLD UNIVERSITY RANKINGS

1	Delft University of Technology	Netherlands
2	Eindhoven University of Technology	Netherlands
3	EPFL	Switzerland
4	ETH Zurich	Switzerland
5	Imperial College London	United Kingdom
6	Institut Polytechnique de Paris	France
7	Karlsruhe Institute of Technology	Germany
8	KTH Royal Institute of Technology	Sweden
9	KU Leuven	Belgium
10	Politecnico di Milano	Italy
11	Politecnico di Torino	Italy
12	RWTH Aachen University	Germany
13	Sapienza University of Rome	Italy
14	Sorbonne University	France
15	Technical University of Denmark	Denmark
16	Technical University of Munich	Germany
17	Technische Universität Berlin	Germany
18	Technische Universität Dresden	Germany
19	The University of Edinburgh	United Kingdom
20	The University of Manchester	United Kingdom
21	University College London	United Kingdom
22	Universidad Politécnica de Madrid	Spain
23	Universitat Politècnica de Catalunya	Spain
24	Université Paris-Saclay	France
25	Université PSL	France
26	University of Cambridge	United Kingdom
27	University of Leeds	United Kingdom
28	University of Oxford	United Kingdom

LinkedIn profiles were then retrieved by combining the university list with six aerospace-related degree disciplines:

- Aerospace Engineering
- Aeronautical Engineering
- Aerospace Systems Engineering
- Space Systems Engineering
- Avionics Engineering
- Satellite Systems Engineering

Profiles were included regardless of graduation year, providing a longitudinal sample that captures career patterns across multiple cohorts and career stages.

For each profile in the sample, the following information was extracted and structured for analysis:

- Educational experience: university name, country, and degree field, used to assign each profile to its country-of-study category and to confirm eligibility for inclusion in the sample.
- Professional experience: sequence of positions held, including employer, job title, industry classification, and workplace location, used to determine current employment and reconstruct career trajectories.

No personal identifying information was extracted or analysed at any stage of the process.