The Industry that Connects & Protects

Facts & Figures 2023
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The Aerospace, Security and Defence Industries Association of Europe

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Dear reader,

In recent years, Europe has faced a number of overlapping geopolitical and economic crises, from the Covid-19 pandemic to the conflicts both in Eastern Europe and in the Middle East as well as the pressing issue of climate change.

I am proud of how our industry – represented by ASD and serving over 4,000 member companies drawn from right across Europe – has come together to confront these challenges. The figures presented in this annual report serve as a testament to the resilience and powers of adaptation of the European aerospace and defence sector.

It confirms that we are living in a VUCA world – Volatile, Unpredictable, Complex and Ambiguous – and it means we have to face some important questions: Can Europe be a beacon of peace, prosperity, and sustainability? Can we achieve this ambition amidst the multiple crises we are dealing with today?

We want to solve the challenges in front of us and I firmly believe that Europe can successfully combine democracy, security, sustainability, competitiveness, growth and the opportunities of a digital world.

To achieve it, we must keep Europe together and we must act together.

Europe’s economic prowess and ultimately our future rests on three pillars:

**Security:** The war in Ukraine underscores the necessity for the European Union to fortify its defence capabilities and preparedness. While progress has been made, fragmentation in Europe’s defence sector and a lack of investment continue to limit the ability to invest in modern capabilities and compete efficiently with other global powers. I believe it is crucial to foster cooperation in Europe and prioritise research and development to support our strategic autonomy.

**Sustainability:** Europe has long been a leader in sustainability and climate action, with the European civil aviation sector being the first to commit to achieving net zero CO₂ emissions by 2050. Our leadership in this area, however, faces competition and regulatory hurdles. Nurturing innovation and sustainable solutions through incentivisation are paramount to our continued success.

**Innovation:** Many of the cooperative projects, innovations and next generation technologies and capabilities underway in the European Aerospace industrial ecosystem, such as sustainable aviation fuels, digitalisation, cloud computing, and artificial intelligence, will help drive scientific and technological progress and secure continued leadership for Europe as a whole.

The challenges ahead of us are exciting and I believe that Europe and the European aerospace and defence sectors are able to address them. We have the values and expertise, we have the vision and we have the ambition. We are calling on the EU and its Member States to further support us in reaching our sector’s goals built on a foundation of collaboration in the true spirit of Europe.

ASD President, Guillaume Faury
Navigating the Years – Industry Trends

An overview of key trends and metrics of the European aerospace and defence industry over a three-year span from 2020 to 2022.

2020 The year of resilience

2020 was marked by the severe impact on the industry of the COVID-19 pandemic, particularly on the civil aviation sector, which experienced its most profound crisis in history. The defence sector, supported by longstanding government contracts, demonstrated robust performance that helped mitigate the adverse impacts the pandemic had on the civil aviation industry. Overall, industry turnover declined by 13.7%, while employment decreased by a significantly smaller margin, at 3.1%, as the industry worked hard to limit job losses. This demonstrated the industry’s resilience in the face of an unprecedented crisis, and its ability to adapt to difficult circumstances.

2021 The turnaround

2021 witnessed signs of recovery, as the civil aviation sector – hit hard by the pandemic – started to rebound. The defence sector remained largely stable. The overall industry turnover increased by 10% year on year, reaching 95% of the pre-pandemic level. Employment was up 3.9%, reaching 1% above pre-pandemic level (the employment rebound was lower than turnover as a consequence of limiting job losses the year before). Although 2021 did not signify the end of the pandemic, it marked a significant step forward towards recovery and growth for the industry.

2022 Stabilised recovery – and new challenges

The 2021 rebound extended into 2022. The total industry turnover increased by 9.8% year on year, and employment growth remained strong at 5.2%. Notably, the growth was a result of near-equitable contributions from both the civil and defence sectors. The growth in the civil aviation sector was largely driven by the resurgence of air travel that continued on its path towards pre-pandemic travel volume. Simultaneously, the war unleashed by Russia against Ukraine led to increased demand for defence products, driven by both support for Ukraine and a reassessment of defence preparedness in Europe with the aim of strengthening Europe’s own capacities.

However, at a time when all indicators pointed towards the need to scale up production to satisfy surging demand in both sectors, fresh challenges emerged, encompassing supply-chain bottlenecks, shortages of critical raw materials and electronic components, along with trade restrictions resulting from sanctions imposed on Russia. Additionally, the combination of soaring inflation and escalating energy costs have further compounded this already complex and demanding situation.

In all, 2022 not only highlighted the industry’s inherent strength and strategic importance for Europe, but also unveiled a host of intricate challenges that need to be addressed effectively to enable our industry to ramp up production to meet surging demand, and to deliver on our mission: to connect and protect.

The geographical definition of the ASD member countries was updated for this report. Historical data were recalculated accordingly, so comparisons to prior reports should take this into context.
2022 Key Data

Facts & Figures

**Turnover**
€260.5bn

The post-pandemic rebound observed in 2021 (10% growth on 2020) continued at a similar rate in 2022, with a year-on-year turnover increase of 9.8% to €260.5bn. The growth was nearly equal in both sectors, with an 11.1% increase in the civil sector and 10% in defence.

Compared to the 2019/pre-pandemic level, turnover was 4.5% higher in 2022.

The 2022 turnover corresponds to a 22% share of the global aerospace and defence market of €1,194bn (down from 24% in 2021; indicating stronger growth in other regions worldwide).

**Employment**
921,000

Following a 3.9% employment growth in 2021, employment in 2022 continued to rise, increasing by 5.2% year-on-year, reaching a total of 921,000 jobs. This increase translated to the addition of 46,000 new jobs. Similar to the turnover, job growth was observed at nearly equal levels in both sectors, with a 6% increase in the civil sector and a 4.4% increase in the defence sector.

Compared to the 2019/pre-pandemic level, employment was 6% higher in 2022.

**EU footprint**
ASD members accounted for 97% of the industry’s turnover and for 89% of the industry’s employment in the European Union in 2022.

**European footprint**
Overall, ASD’s European membership footprint is further strengthened by the substantial contributions of the UK, Norway, and Türkiye, collectively representing 27% of ASD’s membership turnover and 32% of ASD’s membership employment.

The broader economic impact

Applying the algorithms of an Economic Impact Study conducted by S&P Global Market Intelligence (SPGMI) last year, this translates for 2022:

**Turnover**
€625bn

Total turnover supported by the ASD industry was around €625bn in 2022, including direct, indirect and induced turnover.

The 2022 turnover corresponds to a 22% share of the global aerospace and defence market of €1,194bn (down from 24% in 2021; indicating stronger growth in other regions worldwide).

**Employment**
3.5bn

Total European employment supported by the ASD industry was more than 3.5 million people in 2022, including direct, indirect and induced employment.

Compared to the 2019/pre-pandemic level, employment was 6% higher in 2022.

**Wages**
+43%

Direct employees within the European A&D industry are generally highly skilled and well compensated, with an average income of €56,000, 43% higher than the average wage across Europe.

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1 The Economic Impact Study assessed how the European Aerospace and Defence industries stimulate three economic contribution cycles across Europe: (1) Direct economic contributions occurring as a result of the production and sale of aerospace and defence equipment. (2) Indirect economic contributions triggered when members source goods and services from their extended supply chains across Europe. (3) Induced economic contributions resulting from the employees involved in the direct and indirect cycles spending some of their wages in their local economies.

2 Based upon 2022 direct employment of 921,000.

3 Based upon 2022 direct turnover of €260bn.

4 2021 data.
Major developments in the European aerospace and defence industry in 2022

In 2022, the European aerospace and defence industry sustained its post-pandemic economic resurgence. Both the civil and defence sectors experienced robust growth, witnessing substantial increases in turnover and employment, surpassing pre-pandemic levels.

Commercial air travel continued on its path toward pre-pandemic travel volume in 2022, driving growth in the civil aviation space. Simultaneously, the war unleashed by Russia against Ukraine led to increased demand for defence products, driven by both support for Ukraine and a reassessment of defence preparedness in Europe with the aim of strengthening Europe’s own capacities.

Turnover

In 2022, the turnover of Europe’s aerospace and defence industries increased by 9.8% year-on-year, to €260.5bn, stabilising the trend seen in 2021 when the sector was up 10.2% over 2020. The 2022 turnover corresponds to a 22% share of the global aerospace and defence market of €1,194bn; down from 24% in 2021, indicating stronger growth in other regions worldwide.

Within the EU’s 27 Member States (EU27), the industry recorded a similarly robust growth of 10.5% in 2022 (up from 8.3% growth in 2021). The total turnover within the EU27 reached €196.5bn. ASD accounted for 97% of the aerospace and defence industry’s turnover within the EU Member States.

The civil aeronautics sector experienced an 11.1% growth in turnover in 2022 in markets with ASD representation. This surge, a consequence of the recovery of air travel, spurred demand for commercial aircraft, and accelerated the replacement of older fleets with the latest, more fuel-efficient generation of aircraft. In 2022, civil aeronautics generated €114bn in turnover, accounting for 44% of the total ASD industry turnover. This share remained nearly unchanged from 2021 and aligns with pre-pandemic averages. Meanwhile, the defence sector contributed 51% of the total turnover in 2022, with space accounting for 5%.

Turnover in the defence sector grew 10% in 2022, reaching €135.3bn. Notably, this growth was evident across all three sectors: military aeronautics, naval, and land, with growth rates of 9.4%, 9.9%, and 11.2% respectively. The growth reflects rising defence budgets across the continent, driven by the support to Ukraine against the Russian aggression, and the concurrent re-evaluation of Europe’s defence readiness, prompting a focus on enhancing its own capabilities.

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Turnover

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The data shown in this report is based on the geographical membership of ASD, encompassing the 17 countries where the national associations are ASD members. ASD geography (for 2022) includes the following EU and NON-EU Member States:

- **ASD EU**: countries that are represented among the ASD membership and that are EU Member States: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Poland, Portugal, Spain, Sweden, and The Netherlands.
- **ASD NON-EU**: countries that are represented among the ASD membership and that are not EU Member States: Norway, Turkey, and the United Kingdom.
- **NON-ASD EU**: countries that are not represented among the ASD membership but that are EU Member States: Bulgaria, Croatia, Cyprus, Estonia, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Romania, Slovakia, and Slovenia.

All monetary figures are in nominal euros.

97%  
ASD accounted for 97% of the aerospace and defence industry’s turnover within the EU Member States.

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2 Source: S&P Global Market Intelligence Comparative Industry Service

3 Total air traffic in 2022 (measured in revenue passenger kilometres or RPKs) rose 64.4% compared with 2021. Globally, full year 2022 traffic was at 68.5% of pre-pandemic (2019) levels. Source: IATA https://airlines.iata.org/2023/02/06/air-travel-recovery-strengthens-2022.

4 Source: S&P Global Market Intelligence Comparative Industry Service

5 Total air traffic in 2022 (measured in revenue passenger kilometres or RPKs) rose 64.4% compared with 2021. Globally, full year 2022 traffic was at 68.5% of pre-pandemic (2019) levels. Source: IATA https://airlines.iata.org/2023/02/06/air-travel-recovery-strengthens-2022.

6 Source: S&P Global Market Intelligence Comparative Industry Service

7 All monetary figures are in nominal euros.

8 Data for the space sector has been provided by Eurospace.
Employment

Employment in the aerospace and defence industry within ASD member states increased by 5.2%, reaching a total of 921,400 employees, translating into the creation of around 45,900 additional jobs in 2022.10

Employment growth was similar in civil aeronautics (6%) and defence (4.4%) in 2022, while the space sector saw the largest employment growth in the year at 8.2%.

Within the EU27, employment in the aerospace and defence industry grew by 4.4% in 2022, reaching a total of 704,000 employees. Of this workforce, 89% were employed in ASD member states. The share of employment in EU Member States outside ASD’s representation stood at 11%, considerably higher than the corresponding share of turnover (3%). This difference can be attributed to these countries typically engaging in the production of more labour-intensive products, resulting in a higher employment share.

Among ASD’s membership, EU countries account for 68% of the 921,400 industry jobs. This share is slightly less than the 73% share of turnover attributable to this geographical group.

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AsD’s total European membership footprint is fortified by the substantial contributions of the United Kingdom, Norway, and Türkiye, collectively representing 27% of ASD’s membership turnover and 32% of ASD’s membership employment.

While labour markets remain tight, the unemployment rate in the EU27 amounted to a historically low level of 6.1% in 2022.
Exports 2022

Aerospace and defence exports exceeded €150bn in 2022, with civil aeronautics constituting 65% of these exports and the defence and space sector accounting for the remaining 35%. Exports within the civil sector witnessed a growth of just over 10% in 2022, totalling €98.3bn, while military exports reached €52.4bn, marking an 8% increase. It is worth noting that in 2021, military exports experienced a slight decline, reflecting the stagnant growth in total military turnover. However, in 2022, the trajectory reversed, with both exports and turnover showing a recovery.

EU27 exports in the aerospace and defence industry reached nearly €128bn in 2022, with ASD representation constituting 97% of the total revenue generated from exports, the same as the share of total industry turnover. Furthermore, EU countries accounted for 82% of exports within ASD’s overall representation, which is approximately 10% higher than the corresponding turnover share of 73%.

R&D 2022

Innovation and development across both civil and defence sectors have also contributed to growth. R&D investment across the industry totalled €23.2bn, an increase of 18.5% from 2021, with the civilian sector still leading the way, marking an increase of 27% in 2022; and the defence sector showing a growth of 12.9%.  

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12 ‘Exports’ as defined here includes all value of goods delivered outside the country of origin, therefore this figure does include intra-EU movement of goods.
13 For civil aeronautics, most of the R&D investment comes from the private sector. For defence, investment in R&D mainly comes from national governments as key customers. For more details see the dedicated R&D section.
World passenger traffic began to return to normal in 2022, with global total traffic (measured in revenue passenger kilometres) reaching 69% of pre-pandemic (2019) levels for the entire year. In Europe, traffic surged by 132% compared to 2021. This resurgence was reflected in significant rebounds in both industry turnover and employment.

Civil aeronautics turnover reached €114bn in 2022, marking an 11.1% increase over the €102.6bn reported in 2021. The sector accounted for 44% of the total industry turnover in 2022. The notable growth in this regard was seen in the helicopter and commercial aircraft segments, evident from higher delivery figures.

Despite the challenges posed by a tight labour market and a shortage of high-skilled workers, sector employment increased by 6.0% in 2022, reaching a total of 348,000 jobs.

Compared to pre-pandemic (2019) levels, 2022 turnover was 2.3% higher, and 2022 employment was 6.1% higher.

However, at a time when demand surged, new challenges arose. These included supply-chain bottlenecks, shortages of critical raw materials and electronic components, as well as trade restrictions due to sanctions on Russia. Additionally, soaring inflation and escalating energy costs further complicated the situation.

Addressing these complex and interwoven challenges is crucial for the industry to increase production and meet demand, and to ultimately deliver on the industry’s mission, which is to connect people, cultures and economies.

Amid this backdrop, a relatively lesser-known fact underscores the paramount importance of air transport: while air transport carries around 1% of the volume of world trade shipments, it represents over 35% by value – meaning that goods shipped by air are high-value commodities, often perishable or time-sensitive.

The aviation sector, alongside the related tourism industry, serves as a vital engine for employment, supporting nearly 88 million jobs across the globe. Of this, 11.3 million employees work directly in the industry in various capacities.

Civil aeronautics sector is characterised by a diverse landscape that comprises not only numerous large companies but also small and medium-sized enterprises (SMEs). Its operations span across Europe and encompass a wide spectrum of cutting-edge technologies and integrated capabilities. The civil aeronautics sector encompasses a comprehensive range of certified flying objects, both manned and unmanned, throughout their entire lifecycle. This includes various categories of aircraft such as commercial aircraft, business jets, regional jets, general aviation, combat aircraft, and trainers, as well as a diverse array of transport aircraft and rotor-wing aircraft. Furthermore, the sector encompasses vital services such as training and simulation, maintenance repair & overhaul (MRO), as well as air traffic management ground systems.
A route to net zero European aviation

The global aviation industry is responsible for producing around 2% of all man-made CO₂ emissions and 12% of CO₂ emissions from all transport sources.

Civil aviation has already shown a track record of reducing its environmental footprint over the years. The current generation of jet aircraft are 80% more fuel efficient per seat kilometre than the first jets built in the 1960s. Each new generation of aircraft typically reduces CO₂ emissions by around 15–20%. Newer generation aircraft generally burn around 3 litres of fuel per 100 passenger kilometres.

However, much remains to be done in this field. This is why Europe’s aviation sector, with ASD as a committed member, is collectively on board to lead the way in reducing aviation CO₂ emissions by 2030 and 2050 – making flying more sustainable for the long term.

In February 2021, Europe’s airlines, airports, civil aeronautics industry and air navigation service providers laid out a joint long-term vision, and concrete solutions, to the complex challenge of reaching net zero CO₂ emissions from all flights departing the EU, UK and EFTA by 2050. The independent report by the Royal Netherlands Aerospace Centre and SEO Amsterdam Economics shows how a combination of actions from all stakeholders – including the EU and national governments – in four key areas could achieve substantial CO₂ emissions reductions in line with EU climate goals. These include: improvements in aircraft and engine technologies (including hybrid, electric and hydrogen propulsion); using sustainable aviation fuels (SAFs) both for fixed- and rotary-wing platforms; improvements in air traffic management (ATM) and aircraft operations; and the implementation of economic measures to drive sustainability within the aviation industry.

The aviation sector is making progress on carbon reduction initiatives by designing and testing new generations of single-aisle aircraft with lower fuel consumption per seat and operating on longer range. The key solution for the industry, however, is sustainable aviation fuel (SAF) and development of the hydrogen ecosystem. Currently, SAF accounts for less than 0.1% of all aviation fuels consumed. Increasing the use of SAF to 10% by 2030, which would be in line with the net zero carbon emissions goal, will require a significant boost of investment in SAF production capacity as well as supporting policies in the form of fuel taxes or low-carbon fuel standards.

The European air transport sector strongly encourages the wider promotion of SAF around the world. ASD and its Destination 2050 partners call on states and the wider aviation industry across all world regions and at global level to join forces and rally around ambitious and credible SAF objectives – to ensure aviation globally remains on track to attain the ICAO long-term aspirational goal (LTAG) of global net zero carbon emissions for aviation by 2050.

In September 2023, a consortium of international civil aerospace airframe and engine manufacturers and service providers, represented by the ICCAIA, pledged to ensure that their civil aviation products are compatible with and capable of operating on 100% ASTM-qualified sustainable aviation fuels by 2030. Together, the parties to this agreement currently produce and support aircraft engaged in 99% of all international operations of civil aeroplanes, both with airlines and within the business aviation community.

Whilst work continues on the aforementioned pillars, the industry is also looking at the emerging concern of how non-CO₂ factors might influence climate change. It is set to present its perspectives on this matter in the course of 2024.
After decades of low investment, the European defence industry received more attention following the Russian invasion of Ukraine. The EU and its Member States took several steps to improve security and resilience of the region. This includes boosting the defence budget of EU Member States to a combined total of €290bn a year in 2025.

The European Defence Fund (EDF) started operation on 1 January 2021 with a total budget of nearly €8.0bn for the period of 2021–2027. One-third of the total amount finances competitive and collaborative defence research projects, in particular through grants; and two-thirds complement Member States’ investment by co-financing the costs for defence capabilities development following the research stage.\(^\text{18}\)

The EU has also adopted a joint defence procurement instrument (European Defence Industry Reinforcement through Common Procurement Act, EDIRPA) and an initiative to ramp up ammunition production (Act in Support of Ammunition

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<td>€135.3bn</td>
<td>€52.4bn</td>
<td>516k</td>
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### Turnover Defence 2022

- **Aeronautics** €56.4bn (42% share)
- **Naval** €31.6bn (23% share)
- **Land** €47.3bn (35% share)

### Employment Defence 2022

- **Land & Naval** 323,000 (+4.9% yoy, 63% share)
- **Military Aeronautics** 193,000 (+3.6% yoy, 37% share)

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Production, ASAP), as part of a three-track proposal to support Ukraine’s need for ammunition.

The supply-chain bottlenecks caused by the pandemic, with a lack of raw materials and semiconductors, created challenges for military equipment manufacturers. The increased demand for ramp up production in the wake of the Russian invasion of Ukraine reinforced these supply-chain challenges.

Reflecting the variations in national defence expenditures, the European defence industry is predominantly centred in the six ‘Letter of Intent’ (LoI) countries, comprising France, Germany, Italy, Spain, Sweden, and the United Kingdom. Smaller platform manufacturers, equipment suppliers, sub-suppliers, and niche producers also operate in other regions of Europe. The total number of small and medium-sized enterprises (SMEs) engaged in the defence sector is estimated to be between 2,000 and 2,500, highlighting the diversity and spread of defence-related business activity across the continent.

In 2022, the European defence industry represented in ASD generated a turnover of €135.3bn, reflecting a 10.0% increase compared to the preceding year. This growth was evident across all three key sectors: military aeronautics, naval, and land, with growth rates of 9.4%, 9.9%, and 11.2%, respectively.

Simultaneously, the European defence industry experienced a substantial increase in employment during 2022, with the total number of jobs reaching 516,000. This represented a 4.4% increase compared to the previous year. The military aeronautics sector accounted for approximately 193,000 of these jobs, while the combined workforce within the land and naval sectors accounted for 323,000 jobs within the industry.

Military exports increased by 8.0% to €52.4bn in 2022. These exports play a vital role in sustaining the competitive economic performance of the European defence industry, considering the relatively modest size of domestic European markets and the substantial development costs involved.

**Military Aeronautics**

The European military aeronautics sector produces a diverse array of both manned and unmanned aircraft systems, encompassing combat aircraft, drones, transport aircraft, and helicopters. This sector comprises a wide spectrum of companies, ranging from major prime contractors to tier-3 sub-suppliers that specialise in providing essential components and raw materials.

In 2022, the European military aeronautics sector recorded a turnover of €56bn, representing 42% of the total ASD defence sector turnover. Employment within this sector stood at 193,000 jobs of which 6,700 were added in 2022.

**Land and naval**

In 2022, the combined turnover of the ASD land and naval industry reached €78.9 billion, showing a growth of 10.7% compared to the previous year when it had experienced a decline. This industry sector employed 323,000 people, which represented a 4.9% increase from the previous year and accounted for 63% of the total defence industry workforce.

The land forces constitute an essential component for the operational supremacy of the armed forces, and both the EU and the North Atlantic Treaty Organization (NATO) consider ground combat capabilities as one of their main priorities. The largest European land prime contractors are situated in France, Germany, Italy, and the UK, offering a diverse product portfolio that spans from main battle tanks to families of armoured vehicles, artillery, guided ammunition, integrated systems, and components for the battlefield, as well as the protection of soldiers and infrastructure. Altogether, they have generated the

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20 Chart see ‘Major Trends’ section.
European land industry turnover of €47.3bn, which represents 35% of total European defence revenues.

The naval sector is a key contributor to the European defence capabilities, providing a diverse range of vessels, including aircraft carriers and nuclear submarines. In 2022, it generated €31.6bn revenue, constituting 23% of the total European defence revenue. This figure reflects a 9.9% increase compared to 2021 when the naval sector had experienced a marginal dip compared to the results in 2020.

There are six prime contractors in Europe, which have the full responsibility to design, integrate and build military ships (BAE Systems, Naval Group, Fincantieri, Navantia, Damen and TKMS). For the design and development of combat systems and combat management systems, most of the prime contractors rely on tier-1 suppliers specialising in defence electronics. The lower tiers of suppliers consist of a broad range of companies of different sizes and activities, but many of them generate only a small part of their revenues from the defence market.

The future of the European defence industry

The core mission of Europe’s defence industry is to support European armed forces in fulfilling their tasks. To accomplish this mission in the new security environment, the industry must be able to deliver at any time and in the necessary quantities the required systems and equipment and related services (maintenance, repair and overhaul), and to ensure the operational superiority of European armed forces by constant innovation.

To achieve this, it is essential to fulfil four key objectives: (1) enhance the European defence industry’s capacity to deliver, both to meet the current spike in demand and to ensure an appropriate level of enduring industrial capacity and responsiveness; (2) strengthen its technological excellence, through robust investment in defence R&D at national and European level as well as by fostering synergies across the traditional divide between the defence and civil domains; (3) reduce dependences and supply-chain vulnerabilities for certain technologies, components and raw materials to ensure that European defence products strengthen Europe’s freedom to decide and to act; and (4) ensure adequate funding and access to finance, through adequate and enduring public spending, as well as by facilitating defence companies’ access to finance.

At the same time, it is crucial to reverse the current trend in defence procurement across Europe, whereby the vast majority of European defence spending goes to off-the-shelf procurement from non-European suppliers. If this trend persists, it will undermine the European defence industry’s competitiveness and ultimately also European ambitions for a more credible role as a security provider.

Europe’s top 10 defence companies 2022

<table>
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<tr>
<th>Europe Ranking</th>
<th>Company</th>
<th>2022 Defence Revenue (in millions)</th>
<th>2022 Total Revenue (in millions)</th>
<th>Revenue from Defence</th>
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<td>Leonardo</td>
<td>$12,866.12</td>
<td>$15,501.35</td>
<td>83%</td>
<td>#11</td>
</tr>
<tr>
<td>#3</td>
<td>Airbus</td>
<td>$12,022.44</td>
<td>$61,480.67</td>
<td>20%</td>
<td>#12</td>
</tr>
<tr>
<td>#4</td>
<td>Thales</td>
<td>$9,644.49</td>
<td>$18,510.38</td>
<td>52%</td>
<td>#14</td>
</tr>
<tr>
<td>#5</td>
<td>Rheinmetall AG</td>
<td>$5,060.70</td>
<td>$6,753.36</td>
<td>75%</td>
<td>#19</td>
</tr>
<tr>
<td>#6</td>
<td>Dassault Aviation</td>
<td>$5,034.01</td>
<td>$6,642.83</td>
<td>76%</td>
<td>#20</td>
</tr>
<tr>
<td>#7</td>
<td>Rolls-Royce</td>
<td>$4,939.51</td>
<td>$15,695.38</td>
<td>31%</td>
<td>#22</td>
</tr>
<tr>
<td>#8</td>
<td>Naval Group</td>
<td>$4,586.45</td>
<td>$4,586.45</td>
<td>100%</td>
<td>#24</td>
</tr>
<tr>
<td>#9</td>
<td>Safran</td>
<td>$4,214.33</td>
<td>$20,054.93</td>
<td>21%</td>
<td>#28</td>
</tr>
<tr>
<td>#10</td>
<td>Saab</td>
<td>$3,707.69</td>
<td>$4,165.99</td>
<td>89%</td>
<td>#33</td>
</tr>
</tbody>
</table>

Source: Defence News; https://people.defensensews.com/top-100/

Total defence revenue is based on a percentage of total revenue given by the company.
The European space manufacturing industry is a strategic sector, essential for the implementation of many public policies, and supporting all economic sectors. It is embedded in the wider European aerospace and defence industrial complex.

The first business area of the space manufacturing sector lies in the design, development, and manufacturing of satellites for operational applications, such as telecommunications systems, earth observation systems, and position/navigation/timing (PNT) systems, as well as supporting scientific activities and ground systems.

The second area of business are launchers. Launcher activities include operational launch systems sales (mainly to Arianespace) and development and consolidation activities, mostly in support of the Ariane and Vega systems evolution and towards new systems (e.g., micro-launchers).

In 2022 it successfully delivered 96 spacecraft to the launch pad (compared to 80 in 2021). It also delivered 5 launchers for operations at the European spaceport in Kourou (French Guyana).

In 2022, the European space industry witnessed notable employment growth, although it experienced fluctuating revenue levels. Nevertheless, the sector continues to uphold its leading position in the global space industry, even as concerns emerge regarding contributions from institutional bodies.22

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In recent years, the European space industry regained pre-Covid revenue levels and confirmed itself as a solid job provider. Total sales grew from €11.9bn in 2020 to €12.4bn in 2022 while direct space employment grew from 50,500 to 57,500 full time jobs during the same period.

The core business of the European space industry is with European public customers (more than half of sales). As a whole, European customers (public and private) represent 80% of total sales.

In a growingly complex market and geopolitical environment, the European space industry’s activity exhibits four main trends in 2022:

- Employment growth measured at 8%, for a total of 57,000 FTEs. This growth is driven by emerging start-ups and a demand for space-qualified personnel that is difficult to fulfil.
- A stagnation of institutional programmes for spacecraft systems in the key application segments (Telecommunications, GNSS and Earth Observation). This is compensated by the regain of interest provided by scientific programmes.
- A worrying slowdown in institutional programmes for launcher developments. This leads to the postponement of critical milestones and the reduced outflow of contract payments. The state of Europe’s launcher supply chain in 2022 remains a subject of concern for policy makers and customers alike. In 2023, with technical issues still plaguing Vega, and the Ariane 6 maiden launch likely further pushed to 2024, the European launcher sector is looking at the future with concern.
- On a more positive note, Europe reaffirms its strong position in the export markets for space systems. In 2022, space systems exports represented $10bn in the spacecraft segment, and $6bn in the launcher segment, generating a net surplus to the European trade balance worth $900 million every year in the past decade. This positive impact would be much higher if Europe was not the first destination for US satellite exports. Space systems imports not only reduce the positive impact of our exports on the trade balance, but they also diminish the local business opportunities for European space systems suppliers.
Research & Development (R&D)

Research, technology and innovation are instrumental for a sustainable and competitive future.

Investment in research and development (R&D) is pivotal for preserving the competitiveness of the European aeronautics and defence industry. R&D refers to the activities undertaken by companies or governments aimed at enhancing or developing new products and services.

While R&D encompasses the whole research and development process, from upstream research to the final product or service, research and technology (R&T) focuses on the first phases (study of mature technology components (up to TRL 6) that will allow the project to be launched and developed with a lower level of risk).

In 2022, the collective expenditure on research and development (R&D) in the aeronautics and defence sectors, funded by both industry and governments, reached an estimated €23.2bn. This represented a notable 18.5% increase when compared to the 2021 figures. The allocation of this expenditure was divided, with approximately 44% designated for civil activities, and the remaining 56% directed towards military initiatives.

The focus of the future would be investing in cyber security and digitalisation, instead of developing traditional engineering skills. Cyber security and information advantage have become critical areas for national security.
Additionally, for European industry to stay ahead in a fast-changing and global innovation race, the support of national governments and the EU remains essential. The investment gap between the EU and the US is significant when it comes to aerospace and defence-related R&D. If this long-term investment gap persists between Europe and the US (and increasingly other regions of the world), it will undermine Europe’s competitiveness and leadership in these sectors.

R&D in civil aeronautics
In 2022, private and public stakeholders collectively invested an estimated €10.2bn in research and development (R&D) activities within the civil aeronautics sector, marking an increase of 27% compared to 2021. Most of the investment comes from the private sector, driven by both increased spending from the traditional aerospace industry as well as a number of private investors (suppliers and customers).

Although the concentration of investment lies within the private sector, the European Commission is actively backing the aeronautics industry through Horizon Europe, with a particular emphasis on the Climate and Mobility cluster. Additionally, the Strategic Research and Innovation Agenda, developed by the Advisory Council for Aviation Research and Innovation in Europe, plays an important role by outlining future public and private RDI (research, development, and innovation) programmes.

R&D will be the main driver to achieve the ambitious sustainability targets the sector is committed to (Destination 2050; see Civil Aeronautics section). European public–private partnerships (PPPs) such as Clean Aviation and SESAR 2020 are playing a critical role in delivering substantial socio-economic impacts.

R&D in defence
Investments in defence R&D and (its subset) R&T are key factors for the success of industry and its capacity to design and develop the next-generation capabilities of Europe’s armed forces.

Combined European investment in defence R&D amounted to roughly €13bn in 2022, up 13% from 2021, mainly from national governments as key customers. Research and development spending in the defence sector in Europe remains notably centralised, with France and the UK collectively contributing 40% of the total, followed by Germany, Italy, Spain, and Sweden.

In terms of R&D spending, EU Member States allocated €3.6bn in 2021 to defence R&D expenditure, which is a new record level of spending; however, it is still below the 2% benchmark agreed in the EDA framework and set as a more binding commitment within PESCO, for which an additional €725 million would be needed. Nevertheless, compared to 2020 it is a significant improvement, as spending increased by 41%.24

The Strategic Compass, adopted by the European Union in 2022, outlines a practical framework for the EU’s security and defence strategy until 2030. It aims to promote a collaborative approach to defence spending, reduce fragmentation, boost defence innovation, and enhance capability and research by building upon existing EU tools, such as the European Defence Fund (EDF).

The EDF was originally proposed by the European Commission and supported by Member States and the European Parliament. Its budget is close to €8bn, €2.7bn of which to fund collaborative defence research and €5.3bn to fund collaborative capability development projects complementing national contributions. It strongly encourages participation of SMEs in collaborative projects, and fosters breakthrough innovative solutions.

The focus of the future would be investing in cyber security and digitalisation, alongside developing traditional engineering skills.

Services

The crucial role of services in aerospace, security, and defence.

Services play a pivotal role in the aerospace, security, and defence industry, providing essential support for the products and systems that our member companies develop and deliver. These services are indispensable from both an economic and operational perspective, significantly impacting customer satisfaction and the competitiveness and operational efficiency of our industry.

The importance of services

In the context of the industry, represented by ASD, ‘Services’ encompasses a wide array of activities:

- **Contract management:** ensuring smooth project execution.
- **Logistics support:** managing the supply chain, parts, and maintenance.
- **Maintenance and repair:** keeping systems operational.
- **Training and technical support:** building expertise for effective operation.
- **In-service feedback and optimisation:** enhancing system performance.
- **And more:** a diverse range of services to ensure system effectiveness.

These services are integral to our industry due to the intricate and highly technical nature of aerospace and defence products and systems. They guarantee that our customers can efficiently operate and maintain these complex systems throughout their lifecycle.

Moreover, services represent a significant portion of revenue for our member companies. It is widely recognised that around two-thirds of the total lifecycle costs are allocated to support activities. This underscores the economic significance of services in our industry.

ASD’s commitment to Integrated Product Support (IPS)

To bolster the vital role of services, ASD develops standards, position papers, and strategies related to services and Integrated Product Support (IPS). We focus on the entirety of service activities, spanning from early design phases to disposal. This commitment by ASD enhances the competitiveness of our industry and ensures customer satisfaction.

Simplified Technical English has been adopted by more than 125 countries and ensures a common technical language for high-tech sectors worldwide.

S-Series Specifications of Integrated Product Support (IPS):

ASD, in partnership with leading US industry associations, has developed the S-Series Specifications of Integrated Product Support (IPS). These guidelines provide a comprehensive framework for efficient and effective support of both defence and civilian systems throughout their lifecycle to improve product reliability, safety and environmental performance. They encompass logistics, maintenance planning, supply-chain management, training and technical data, reliability and maintainability, and sustainment.

These specifications are continually updated and fine-tuned to align with the latest IPS solutions, offering optimal efficiency for complex aerospace and defence systems.

In addition to the S-Series, ASD was the founder of – and maintains – STE100: Simplified Technical English, guiding technical writers in creating clear, concise, and unambiguous technical documents, ensuring global comprehension. Simplified Technical English has been adopted by more than 125 countries and ensures a common technical language for high-tech sectors worldwide.
The year 2022 will be etched in history as a time of profound geopolitical transformation.

In response to the Russian war of aggression against Ukraine and its impact on the European security landscape, it has become imperative for EU and NATO members to ramp up their defence production capacities. This requires long-term planning and commitment. Companies need to invest in production facilities, recruit and train personnel and address supply-chain challenges.

Addressing these issues is essential as our defence industry continues to stand as a steadfast partner to our governments' vital armed forces, to help protect Europe's territory and values.

Ramping up production to meet increased demand – due to an increase in orders from airlines responding to the unprojected volume of passengers – has also been a critical issue for the aeronautics industry in 2022, continuing into today. However, ramping up production while at the same time facing rising energy prices, a shortage of skilled labour and major disruptions of supply chains for basic component and raw materials put even the crisis-tested European aeronautics industry under enormous stress.

The aerospace industry provides safe, reliable, and increasingly sustainable air transport, connecting people and goods worldwide. As our commitment to addressing decarbonising aviation remains unwavering, we recognise the importance of regulatory frameworks that safeguard the competitiveness of the European industry to propel us forward in achieving our environmental objectives.

And in a world marked by global geopolitical shifts and digital transformation, compounded by the challenges of climate change and the unpredictability of war and conflicts, the significance of space assets cannot be overstated. The European space sector is actively enhancing its resilience, devising solutions to advance the EU’s aspirations, and preparing to confront the escalating competition in the commercial space arena.

As we navigate this ever-changing landscape, we place our trust in the EU institutions and national governments to collaborate closely with industry, fostering mutual confidence and partnership.

ASD Secretary General
Jan Pie
Methodology

Since 2022, the Aerospace and Defence Industries Association of Europe (ASD) has partnered with S&P Global Market Intelligence (SPGMI) to develop and coordinate the findings presented in this report. The written commentary and outlook was a collaboration between the SPGMI team and ASD.

Historically the annual Facts and Figures document was limited to the countries encompassing the ASD membership. The SPGMI methodology enabled the expansion of the perimeter for this analysis to cover not just those countries but to also include the remaining countries within the EU27.

In the current report, Bulgaria has been excluded from the ASD countries’ analysis and moved to ‘remaining EU27 states’, which means ASD members, as described in the report, comprise of 17 countries.

SPGMI worked closely with ASD to ensure that the methodology used in this study generated results that were consistent with what ASD has produced in prior reports. As such, comparisons of results for the ASD geography within this report can be considered against prior reports but, due to the changes in methodology, those comparisons should primarily focus on trends and orders of magnitude.

The Facts and Figures in this report are a result of a mix of statistical methods and estimations that leverage the significant internal data compiled by SPGMI, as well as relevant publicly available information. As has been done in previous reports, the data continues to take into account exchange rate fluctuations and different statistical accounting measures across the EU. As usual, and since Eurospace became the Space Group of ASD, space sector data are provided separately and integrated in the overall analytical framework.

The definition of aeronautics includes civil and military aeronautics. The definition of defence combines all sectors, i.e., military aeronautics, land and naval. Each sector combines systems, platforms and components. The definition of space sector includes the development and production of spacecraft, space launchers and the directly related professional (and military) ground segments for operations (consumer terminals and receivers are not included).

The space segment data set are provided by ASD-Eurospace, the Space Group in ASD. The data set is the result of a proprietary statistical survey conducted by ASD-Eurospace among the companies with space activities in Europe, this makes for an extensive and exhaustive perimeter for the survey, covering both EU and ESA member states. The survey focuses on measuring the value of sales and employment derived from the design, development, and manufacturing of space systems in Europe. The Eurospace data set identifies within the total industry sales, the final sales and the intersectoral sales.


The SPGMI internal assets include the following:

SPGMI Comparative Industry Service (CIS) provides forecasts, analysis, and high-impact content to help clients to rank, size, and compare global sector performance, understand supply-chain dynamics, and develop competitive strategies. The service provides data across 75 countries/territories and covers 105 industries following the United Nations’ International Standard Industrial Classification of All Economic Activities (ISIC).

SPGMI Global Trade Analytics Suite (GTAS) is the most comprehensive trade research tool on the market, delivering decision-ready intelligence, and helping customers to evaluate global trade, commodity values, and identify companies involved in trade activity. The platform combines historical trade data by country, regions, custom districts, ports and transport modes across 5000+ product groupings at HS6 level; transactional level data from Bill of Lading documents, as well as bilateral trade forecasts providing a forward-looking view of trade at the commodity and country levels.

About S&P Global Market Intelligence:
S&P Global Market Intelligence integrates financial and industry data, research, and news into tools that help track performance, generate alpha, identify investment ideas, understand competitive and industry dynamics, perform valuation, and assess risk.

S&P Global Market Intelligence is a division of S&P Global (NYSE: SPGI), which provides essential intelligence for individuals, companies, and governments to make decisions with confidence. For more information, visit https://www.spglobal.com/marketintelligence/