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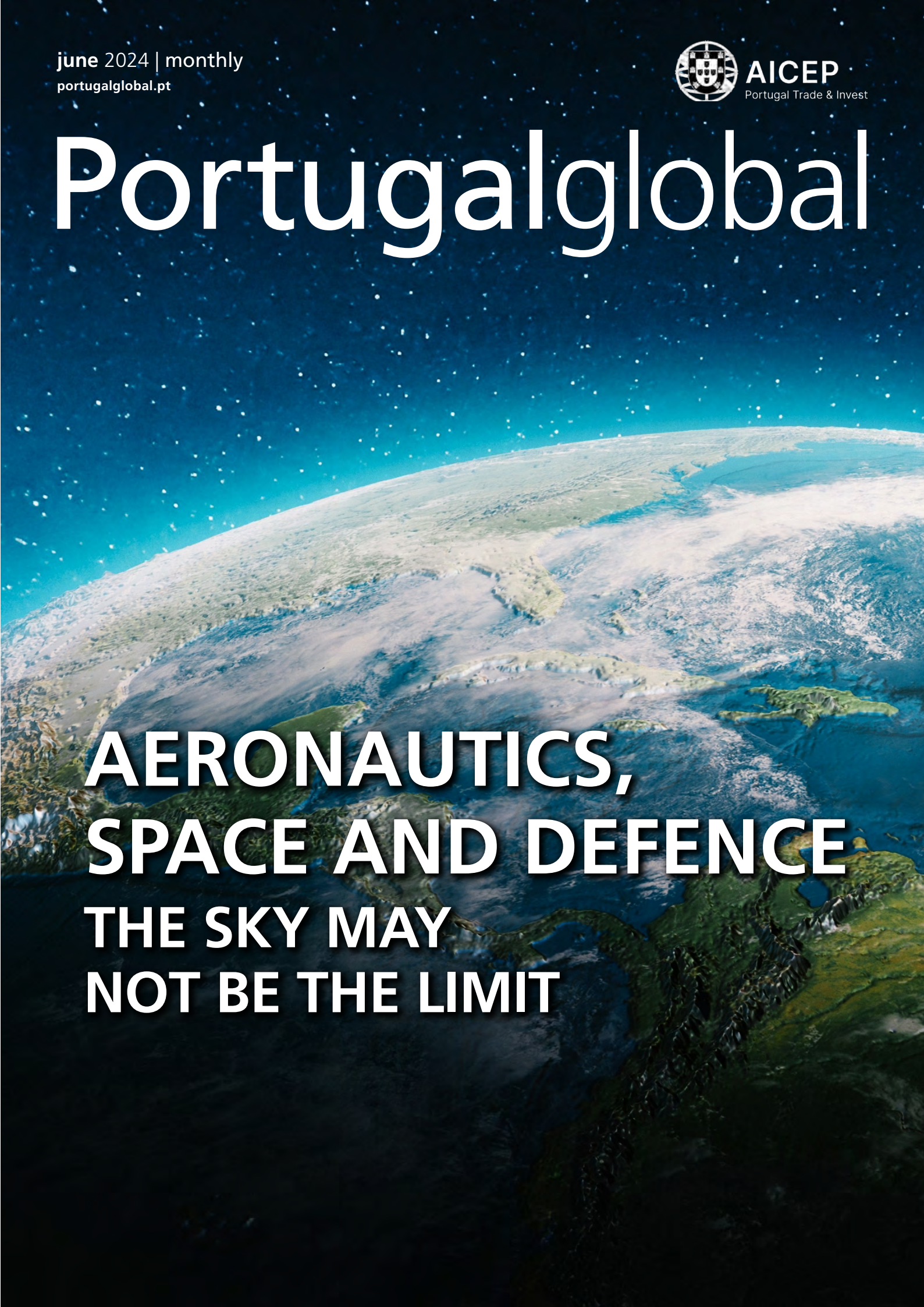

AERONAUTICS, SPACE AND DEFENCE

THE SKY MAY NOT BE THE LIMIT

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Portugalglobal
www.portugalglobal.pt
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Newsroom and advertising
Rua de Entrecampos, 28,
Bloco B, 8º andar
1700-158 Lisboa
Tel.: +351 217 909 500

Property
AICEP – Agência para o Investimento e Comércio Externo de Portugal
Rua Júlio Dinis, 748, 8º Dto
4050-012 Porto
Tel.: +351 226 055 300
NIFiscal 506 320 120

Edition
AICEP – Agência para o Investimento e Comércio Externo de Portugal
Rua Júlio Dinis, 748, 9º Dto
4050-012 Porto
Tel.: +351 226 055 300
NIFiscal 506 320 120

ERC: Registo nº 125362

Board of Directors
Ricardo Arroja (president)
Francisco Catalão
Joana Gaspar
Madalena Oliveira e Silva
Paulo Rios de Oliveira

Diretor
Olga Benquerença
olga.benquerenca@portugalglobal.pt

Newsroom
Isabel Gorjão
isabel.gorjao@portugalglobal.pt
Catarina Santos
catarina.santos@portugalglobal.pt
Rafaela Pedroso
rafaela.pedroso@portugalglobal.pt

Photography and illustration
©Unsplash, ©Shutterstock,
Joana Morgado, Rodrigo Marques,
©AICEP-2024.

Graphic Design
Rodrigo Marques
rodrigo.marques@portugalglobal.pt
Joana Morgado
joana.morgado@portugalglobal.pt

Advertising
Cristina Santos
cristina.santos@portugalglobal.pt

Read the **Editorial Statute**

Aeronautics, Space and Defence

The sky may not be the limit

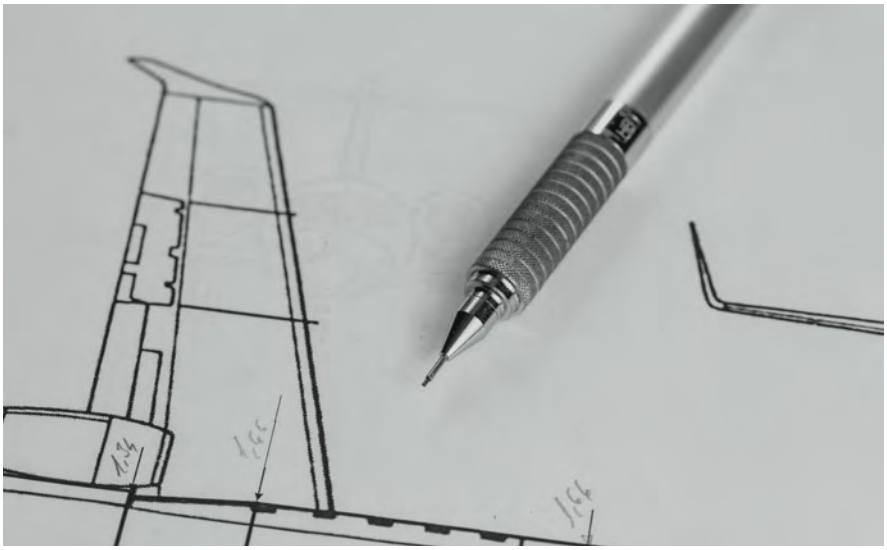
Technology, innovation, and talent. Many nouns can be associated with the aeronautics, space, and defence sectors, but they all refer to a high level of demand and rigour. Portugal has an increasingly strong and diversified aerospace industry, exports more than 90 per cent of what it produces, and employs 18,500 people. The sky may not be the limit.

Close to several aerospace hubs in Spain, France, and Italy, and with a privileged location where the Atlantic connects Europe to the American continent and Africa, Portugal has been an attractive destination for investment in the aeronautics, space and defence sectors. The excellence of training and increased research capacity in these areas are decisive. Having one of the highest rates of engineering graduates in the European Union guarantees skills. This is why Portuguese companies linked to aeronautics and space have gained international notoriety and attracted the interest of investors.

The aeronautics, space and defence cluster has reached a turnover of 1.72 billion euros, according to AED Cluster Portugal, which brings together 135 stakeholders in these sectors that have seen remarkable growth over the last two decades, with diverse skills in the design, conception and production of tools, components and services. It is these skills, combined with the quality of training and the potential of Portuguese companies in these sectors, that have made it possible to bring several major investors from the aerospace industry to Portugal, such as Airbus Atlantic, Rocket Factory Augsburg (RFA) or Beyond Gravity.

The aeronautics, space and defence sectors have become increasingly attractive for foreign direct investment or the establishment of international partnerships, and the challenge for the future is greater integration to position the national offer further ahead in global value chains. Portugal has developed skills in different areas linked to the aeronautics industry, from manufacturing aerostructures and other parts to interiors, support equipment and technologies, moulds and tools, maintenance, repair and operations services and advanced air mobility. For example, the current capacity of Portuguese companies to manufacture drones or uncrewed aircraft vehicles/systems (UAV/UAS) stands out. Tekever is a global leader with a notable structure in Portugal and abroad. Still, other Portuguese SMEs specialising in unmanned systems with dual-use applications also stand out, such as UAVision, Beyond Vision, Drone and Data Systems, among other players with the capacity to develop drone parts and systems using composite materials and top engineering.

More than 150 Portuguese companies produce for the aeronautics sector, and 90 per cent of their production goes to foreign markets. Some main destinations are France, Brazil, Spain, Italy, the United States, Switzerland, the United Kingdom and Sweden. Customers include aeronautical giants such as Airbus, Boeing, Dassault, Embraer, Leonardo and Lockheed Martin. Most are Original Equipment Manufacturers (OEMs) or Tier 1 suppliers. Around 20 per cent of national production for the aeronautical sector is related to the manufacture of aerostructures, followed by the development of tech-



The aerospace and defence ecosystem in Portugal

The universities are a central pillar of the aerospace and defence ecosystem in Portugal. From the north to the south of the country, on the coast and inland, we find higher and technical education that contributes decisively to the training and specialisation of national talent applied to aeronautics, space and defence. Aerospace, IT, mechanical, electrotechnical and materials engineering, among others, make a decisive contribution to the downstream performance and positioning of the industry.

Several research and development centres contribute to the technological interface with Portuguese and international industry, playing an essential role in international consortia dedicated to developing new solutions for materials, processes, products and technologies for present and future aeronautics and space programmes.

In Portugal, there are more than 150 companies with different skills, most of them dedicated to dual-use markets, supplying mobility and other industries. These companies are highly exporting, innovative, and very competitive. Around 90 per cent of the AED sector's turnover is exported.

There is currently an economic recovery in the aeronautics sector to 2019 levels, pre-pandemic, with more companies supplying aeronautics. Thus, the importance of aeronautics and defence in the turnover of supplier companies is expected to grow. In the national context, second and third-line suppliers (tiers 2 and 3) can contribute to meeting the growing demand from Western manufacturers, with an interest in identifying credible partners that bridge gaps in value chains with nearshoring solutions.

Large multinational companies have set up skills centres in Portugal, but the performance of the many national SMEs working in these sectors, from the production of tools to interior and exterior components to the development of software for aircraft and unmanned aerial vehicles/systems, is also noteworthy.

Portugal is home to one of the best aviation schools in Europe, Sevenair Academy, which capitalises on the privileged conditions that Portugal offers for pilot training. Technology has also been developed in Portugal for application to international navigation. Present in airports worldwide, solutions developed by Thales Edisoft in Portugal stand out in the global market.

With sustainability as a central driver, developing new composite materials and promoting the circular economy in companies are joined by producing more sustainable fuels for the aeronautical sector. The production of SAF – Sustainable Aviation Fuel – will soon take place in Portugal, a clear commitment that, through investment projects, aims to respond to a growing global demand that is still in short supply on a global scale.

Portugal wants to establish itself as a relevant player in the aerospace and defence context and is taking significant steps in this direction. It seeks to meet the needs of the present without compromising the future of Earth, the oceans, and space.

nologies and other support tools. Soon, engines will become more important, with components manufactured in Portugal and a new maintenance centre certified by US engine manufacturer Pratt & Whitney.

The Portuguese Space Agency (PT Space) was created in 2019 in the aerospace sector. In this field, too, the country's offer has diversified, in areas such as satellite communications, global navigation systems, robotics, and scientific participation linked to space. According to data from PT Space, around 80 companies operate in this sector. As this is an area of cutting-edge technology, it also involves 30 research and development centres.

Today, components for micro-launchers and satellites are produced in Portugal, and in-orbit telecommunications systems are being developed. The creation of the Santa Maria Space Technology Centre in the Azores paves the way for the launch of suborbital flights. It could become a strategic platform for re-entry into space in Europe, a step that will make an extraordinary contribution to the sustainability associated with space. Portugal has also increased its offer of Earth observation and technologies that make it possible, for example, to monitor the effects of climate change from space, the management of natural resources, the monitoring of agriculture or aquaculture, and the development of smart cities. In Portugal, Geosat is one of the two European operators of very high-resolution satellites, which are essential for the products and services developed in Earth observation.

Gone are the days when the space race was just a competition between superpowers for geopolitical and national security reasons. Today, access to space has lower costs and many other objectives linked to communications or combating the climate crisis. Space has become a sector more characterised by cooperation in which Portugal has skills to offer, geared towards the traditional institutional market, but now also towards the 'New Space'. This concept is related to the new era of commercial exploitation of space, technological advances, and the ability to develop space systems more quickly and at less cost, allowing access to space with new business models.

C4I (command, control, communications, computers and information) technologies for military operations, equipment and software for simulation and training and technologies for manufacturing electronic or mechanical components and systems were developed for the military sector. Added to these activities is the contribution of various sectors of

activity that have skills with dual-use applications – in the military and civilian areas – such as information, communication and electronic technologies, metalworking, technical textiles and footwear, health and agri-food, with skills to supply the global defence industry.

The Portuguese Armed Forces—the Air Force, Army, and Navy—play a central role. They have proven track records in the different scenarios in which they operate, also demonstrating the quality of the national offer with partners associated with the development of essential technologies for modernising the defence approach. This consolidates Portugal's historic role as one of the twelve founding members of NATO, a collective military defence alliance between North American and European countries.

International partnerships and investments strengthen Portugal's reputation

Foreign investment and international partnerships related to aeronautics, space, and defence have also increased in recent years and contributed to the notoriety of these sectors. For example, the German group Rocket Factory Augsburg (RFA) established a partnership with the Centre for Engineering and Product Development (CEiiA) in Matosinhos in 2021 to produce space launcher systems in Portugal. The training and expertise of the more than 300 engineers working at CEiiA, who now develop complex components for the space sector, have contributed to this.

The US company LeoLabs also selected the spaceport of Santa Maria, in the Azores, to install a space radar designed to track satellites and space junk in low Earth orbit, up to 1,000 kilometres above sea level, increasing the company's monitoring capacity. For its part, Airbus chose the Portuguese company Critical Software as its strategic partner for developing critical software and systems and applications for aircraft cabin management.

As part of the Mobilising Agendas, which brings together national entities to define the future of aerospace, Geosat, Lusospace, EEA, and Neuraspace are leading consortia dedicated to developing new aeronautical and space products and services. Dual-use light regional aircraft (civil and military), new drones/UAS, satellite constellations, and technology to combat space junk are examples of areas in which we will have new products and services available for the market in the very near future.

These are just a few examples of partnerships or investments in the aerospace sector. 'The Portuguese ecosystem has already proved its worth and still has great growth potential, capable of meeting the challenges facing these industrial sectors,' emphasises José Neves, president of AED Cluster Portugal, in the publication where the association takes a snapshot of these sectors. 'That's clear, and the aim is to show that to the world.'

A study published in April by the World Economic Forum suggests that space-related technologies will be the answer to some of the main challenges facing companies and society. It predicts that the global economy linked to space will reach 1.8 trillion dollars by 2035, compared to 630 billion in 2023. It will, therefore, triple in just over a decade. And it will grow faster than the world's GDP, impacting almost every area of the economy and life, from transport to food, including defence and digital communications.

Portuguese participation in international fairs in 2024

ILA 2024
Berlin
5 – 9 june

Farnborough International Airshow 2024
Farnborough
22 – 26 july

IAC 2024
Milan
14 – 18 october

Aerospace Alley
Hartford
31 october

ESA Industry Space Days 2024
Noordwiik
18 – 19 setembro

Portugal Air Summit
Ponte de Sor
9 – 12 october

MRO Europe 2024
Barcelona
22 – 24 october

Euronaval
Paris
4 – 7 november

Space Tech Expo
Bremen
19 – 21 november

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AED Cluster Portugal

GETTING EVERYONE WORKING TOGETHER

Some sectors require strong cooperation between companies, universities and research centres, and aeronautics, space and defence are at the top of that list. When founded eight years ago, AED Cluster Portugal wanted to 'get everyone working together'. Part of the mission has been accomplished, but many challenges still lie ahead. Today, every Airbus, Boeing or Embraer aircraft that takes off has systems or components produced in Portugal. The AED Cluster Portugal highlight the emergence of new business models and the increased interest of international players in Portugal.

AED Cluster Portugal was created in 2016 to promote the aeronautics, space and defence industries. At the time, it comprised half a hundred companies, but today, it has more than 140 members. Its president, José Neves, points out that these include Airbus and Embraer. 'These multinationals weren't present in Portugal then but are now.' Today, he says every Airbus, Boeing, or Embraer aircraft that is taken to the air has systems or components produced in Portugal.

'We are increasingly boosting exports and our companies. We are growing in jobs. The big goal is to project the cluster outwards,' emphasises José Neves. To this end, AED Cluster Portugal has sought to bring together not only companies but also universities, research centres, city councils, and the entire spectrum linked to the aeronautics, space and defence sectors.

The big challenge is to get everyone working together, says José Neves. 'It's not usual for organisations to work together in Portugal. They typically see each other as competitors. This was a crucial step. When CEiiA [Engineering and Development Centre] develops an aircraft, Tekever builds a drone, or Geosat promotes the development of satellites; it can't do it alone.'

The systems developed in the aeronautics, space and defence sectors are complex and require significant investments. For this reason, the president of AED Cluster Portugal believes that the best option is to promote joint work between different organisations. 'We already have good examples of projects, including research and development, created by ten or twenty companies in conjunction with the scientific and technological system.'

For José Neves, AICEP's support in promoting Portugal abroad and attracting investment has also been significant. 'This is critical for the sector and its growth,' he says, emphasising the importance of creating and retaining talent, contributing to its success. 'Today, when we develop aircraft or drones, we are on a par with the best in the world.' Rui Santos, general manager of AED Cluster Portugal, also emphasised the sector's growth and evolution in the value chain. 'Companies are increasingly asking us to look for technologies and at Portuguese human capital, engineering, and knowledge.'

After the pandemic, European players began to look more closely at Portugal. 'There has been an absolute upturn in the aeronautics sector. Many suppliers are asking for new Portuguese part-

'We are increasingly boosting exports and our companies. We're growing in jobs. The big goal is to project the cluster outwards'.

José Neves, President of AED Cluster Portugal

ners, and a new chapter has opened. There's been a big boost in universities, and the higher average courses are attracting the most qualified people.' With these conditions in place, the focus has moved up the value chain. 'SMEs play an essential role in creating and retaining this value.'

The cluster brings together a wide range of companies, from those that make the cutting tools associated with the aeronautical production sector to those that develop embedded systems for satellites. 'There are exciting business models in the aerostructures area, and we can see this in the international players who have come to Portugal,' says Rui Santos. 'Several SMEs dedicated to manufacturing equipment are also starting to appear in the maintenance sector.' The Airbus factory in Santo Tirso and Aernnova in Évora are just a few examples. 'Some sizeable parts are already being manufactured in Portugal, which is also a game changer, unlike 15 years ago,' adds José Neves.

Sustainability will bring new opportunities.

Sustainability is also a crucial issue in these sectors and an opportunity for many companies. 'We have several Portuguese companies working on the European Clean Aviation programme, looking at new aeronautical structures. Several companies are working on fuels and smart energies. The opportunities are great because the whole sector will make this transition,' says Rui Santos. 'The huge challenge is to understand what the opportunities are. However, the area of greener and lighter aeronautical structures is one of them, not least because we can manufacture aeronautical structures in Portugal. There are also areas of systems, circular economy, and fuel production. The new airport could be the first to integrate green energies into its design, which is a huge challenge and opportunity for Portuguese companies to position themselves at the forefront of supplying this fuel type.'

José Neves stresses several opportunities in the defence area, including the development of parts and components. 'Companies have to internationalise and invest a lot in working abroad. In the defence sector, credibility is very important, and the supply chain has remained very stable over the last few decades. Therefore, the entry of new players always takes time. And investment in certifications to work in defence is essential.'

'The huge challenge is to understand what the opportunities are. But the area of greener, lighter aeronautical structures is one of them'.

Rui Santos, Director-general of AED Cluster Portugal

'The area of autonomous systems is the key to moving up the value chain,' adds Rui Santos. 'We're talking about aerial and aquatic systems, more than drones.' For the Director-general of the AED Cluster, Portugal must contribute to the defence of European values and Europe, which includes the defence industry. 'We're not going to be making helicopters or submarines soon. But there will always be international partnerships that should be as integrated as possible.'

In the case of space, the situation is similar. 'We've seen great competition at the international level, with players like China or India. Europe is lagging behind, and there is a clear message that we need to invest more in space,' emphasises Rui Santos. New private players have brought a new international dynamic, and there has been a miniaturisation of products, microsatellites, nanosatellites and micro launchers that are more within reach of Portugal and the Portuguese companies. 'While the investment to make satellites is in the order of millions, now we're talking about thousands, and Portugal has been able to capitalise on this paradigm shift intelligently.' The first important step was Geosat and Portugal's becoming a satellite operator. Then, Portugal's entry into the European Space Agency (ESA) reinforced its competencies.

The aeronautics, space and defence cluster has been growing, and last month, its main annual event, AED Days, brought together more than 600 participants in Oeiras. This was a significant moment for the president of AED Cluster Portugal. 'We had the participation of major global manufacturers such as Leonard or Lockheed Martin, participants from five continents, and there was a showcase of the best being done in Portugal,' says José Neves. 'Companies already see AED Days as a critical platform for their commercial activity, and the various international players were impressed with what was happening and asked when it would be next year.'

RICARDO CONDE

PRESIDENT OF THE PORTUGUESE SPACE AGENCY

'SUSTAINABLE SPACE FOR A SUSTAINABLE EARTH IS OUR MOTTO'

When the Portuguese Space Agency was created five years ago, the number of Portuguese companies linked to space was much lower, but since then investment has increased, and new courses have opened at universities. Ricardo Conde, president of the Portuguese Space Agency, believes that Portugal, through the Santa Maria space centre in the Azores, can become a re-entry point for space missions. Services for Earth's sustainability will be created in space.

What is your assessment of the agency's activity and the space sector in Portugal?

If we look at what has developed, for example, over the last 25 years, Portugal has exceptionally qualified in some areas. We have an SME-based space sector with approximately 80 companies. That number has doubled in the previous four years, and we have companies taking part in high-tech, more complex, and more ambitious missions, particularly on the European scene.

What missions are you referring to and what is the reason for this growth in the space-related ecosystem?

For example, the second series of images and data from the Euclid mission, the European space telescope launched last year to study the dark matter of the universe, has just been released. The mission includes Portuguese instrumentation and technological components. This contribution is related to the specialisation of companies in certain areas. For example, the questions about navigation, validation software, or observation slots. This is due to a commitment to Portugal to gain these capabilities. We must ask this question: How do we want to position ourselves in the space panorama? In recent years, there has been an increase in public investment, for example, through Portugal's participation in the European Space Agency (ESA).

How has this sector evolved? Can you give some figures?

Yes. For example, investment in space in Portugal totalled 135 million euros in 2023. This is not a small amount; we've never had such a significant investment. In 2022, we had venture capital investments from the private sector of 30 million. The progress has been impressive. The industry employs 1,600 people, and we have 84 companies operating in this sector with a gross added value of around 27 million euros. Since 2019, we've had several courses open at various universities.

What are Portugal's main competitive advantages when it comes to space?

We will continue with international missions but must have a national component. Portugal must have a space access and return node. Re-entry [of capsules from space] is an opportunity for the country. In particular, we want the Santa Maria Space Technology Centre in the Azores to be a re-entry point for Europe. And we're going to focus more and more on re-utilisation and re-entry missions. Santa Maria could be the re-entry centre for the next European space vehicle, and we're trying to make it a European mission return centre.

Space also has to provide services for the significant problem of our time: the sustainability of the territory and the planet. We must look more dynamically at Earth observation data. There are fundamental things, such as the ability for civil protection to understand, from a laptop or mobile phone, which areas are clean to monitor fires in real-time. This is going to be a reality in a short time.

We use space technologies every day without realising it, for example, through positioning systems on mobile phones. But for this to happen, we need a huge number of satellites in orbit, a value chain that produces these satellites, and services that make it all possible.

There's been a lot of talk about the concept of New Space and the commercial utilisation of space. What does that mean in practice?

That's all it is: space as an economic area. In the past, the role of governments was transversal and based on voluminous and costly projects. The Apollo programme, for example, which put a man on the moon in the context of the Cold War, was a technological demonstration during the space race. These knowledge experiments are still reserved for the state. Still, there is the business side of space, which provides telecommunications services, Earth observation in very high temporal and spatial resolution, positioning services, and the lunar economy.

Why are we looking at the moon again after 60 years? It's a geopolitical extension of our territory, and around the moon, there will be constellations of satellites, orbital stations, and positioning systems.

In which areas do you identify the most opportunities for internationalising the Portuguese economy and companies linked to space?

Our internationalisation involves participating in major European missions. But we have to make international partnerships to attract companies to our fabric, increase our expertise, and strengthen our value chain. We must make clear bets on something we are good at.

What are the areas in which Portuguese companies have excelled?

We have small subcomponents that we can and should continue to develop. We recently celebrated that a small Portuguese company sells valves for the Vega rocket. We also have an operational role, for example, in space access and return.

The Portuguese government created the Portuguese Space Agency to implement the national strategy Portugal Space 2030. What are the priorities of this strategy, and how does it affect the various domains?

A strategy is, by nature, a thought. It brings together national capacity building, using Earth observation data as a valuable tool, and enhancing infrastructures. That's what we've been doing, particularly in Santa Maria and other areas. This strategy has already been implemented, including space access and return points, the national GeoHub, and the financing of Portugal's capacity to build small satellites. It is, therefore, based on a vision involving the country's technological transformation.

We are also talking increasingly about sustainability in space. How can Portugal contribute to this?

We have a motto: 'A sustainable space for a sustainable Earth'. We have the idea that everything is infinite, and for many years, we looked at the sea with this mental format as if we could turn the sea into our rubbish bin. That's what we've done for years. We turned the ocean into a huge problem, and the ocean is our regulator. The space race had the same mindset; there was no concern. We put satellites into space or the tops of rockets in orbit with a bang. This perception is different today, and Portuguese companies can also play a role here. Portugal has a highly active role in this. ●

CARLOS FÉLIX

PRESIDENT OF idD PORTUGAL DEFENCE

‘THE PROMOTION OF SYNERGIES IN THE FIELD OF DEFENCE IS ONE OF THE MAIN OBJECTIVES’

Carlos Félix, president of idD Portugal Defence, the entity that promotes public policies for the defence industry, stresses the importance of establishing synergies, having more exporting companies, and attracting more investment in this sector. He emphasises the need to boost innovation and research projects so that they can lead to new products and technologies.

idD Portugal Defence is a public company dedicated to the Defence Economy. What is its mission?

idD acts as a public policy instrument for the Defence Economy. We began our work in a challenging geopolitical and geo-economic context at an extraordinary time for international politics and, consequently, for the defence industries, to which Portugal is no stranger. We aim to collaborate and exploit synergies with other national and international partners. To be an intelligent and active interface between Defence and the Economy. This means leveraging the industrial activity of munitions, promoting the improvement of the ecosystem to support the growth of the Defence Economy, ensuring the sustainability and resilience of public shareholdings in six Defence Industry companies and maximising the contribution of the Defence Technological and Industrial Base (BTID) to the operationality, modernisation and innovation of the Armed Forces.

We know that the innovation environment is created and accelerated thanks to the joint action of the players in the Triple Helix - academia, government, and industry.

How do you think this cooperation has worked in Portugal, in the context of Defence?

Cooperation has developed fruitfully, as seen in the growth of new players and the ongoing international and national projects developed jointly by the Armed Forces, companies and academia in traditional areas and emerging and disruptive technologies. But we want to go further. In the medium term, we want to have more exporting companies in the Defence Economy, increase exports and export markets, bring in more added value, attract more national and foreign direct investment and strengthen the national presence in the different NATO and European Union discussion and study groups, through the creation of the Technological Base of Defence Experts, as well as supporting greater access to EU and NATO financial instruments, which are expanding.

The defence industry is characterised by the need to constantly adapt to new and unconventional threats, such as cybernetics.

How has Portugal and the national industry adapted to the digitalisation of defence?

Of particular note here is the Cyber Academia and Innovation Hub (CAIH) project, which aims to develop cyber-defence capabilities in Portugal. There are three strategic lines: Education, Training and Exercises; Research, Development, and Innovation; and Industry Development. The idD is coordinating the last action to promote experimentation, evaluation and certification of new solutions and technologies, as well as knowledge transfer in the BITD.

What is your analysis of Portuguese companies' capacity to respond to the challenges of the new international context? How can companies that are not exclusively dedicated to the defence sector contribute to the development of products used for civilian and military purposes?

There is already a diverse range of skills that are on the increase: C4I (command and control), MRO (maintenance and repair), training, simulation, training, production and trade of systems and components, uncrewed systems and vehicles, automation, robotics, engineering, textiles and technical footwear, among others.

It is essential to pursue a defence industrial policy that focuses on standardised industries, where the major challenge is to increase production, support soft-driven companies by streamlining contracting, customs and import and export processes, speed up development and updating cycles, invest in niches where we can bring more excellent added value and in services that are relevant to the self-sufficiency of the Armed Forces. Alongside this, it is important to boost the results of innovation, research, and development projects so that they reach the point of industrialisation.

NATO has been strengthening its position, and an increase in collaborative activities between member countries is expected. What are the main competencies of the national industry that could strengthen Portuguese participation?

The idD is mapping the capabilities and maturity of the companies that traditionally operate in the defence market, particularly in drones, communications, command and control, MRO, aerostructures, construction, space, textiles, and innovation as a service. On the other hand, aware of the geopolitical moment, we have sensitised different clusters with credits in the civilian market to this area, particularly the metalworking, agri-food, wood pulp, chemical and pharmaceutical sectors.

In addition, the Atlantic Alliance is increasingly promoting the innovative nature of the industry, fostering initiatives such as the DIANA (Defence Innovation Accelerator for the North Atlantic) programme. How is Portugal's participation in this type of programme going?

Portugal had the privilege of being selected for a test centre, at the Navy's Operational Experimentation Centre, and an accelerator, to be installed at Arsenal do Alfeite, for which idD Portugal Defence is responsible. Start-ups and organisations from the National Technological and Scientific System with headquarters can take part in the challenges launched by DIANA.

IST

‘University education in engineering is of high quality in Portugal’

The Instituto Superior Técnico (IST) is one of the leading engineering colleges in Portugal and a reference in aerospace engineering. More than three decades ago, IST created the integrated master’s degree in this field, which led to the creation of the bachelor’s degree and the master’s degree. Fernando Lau, Professor of Aerospace Engineering at IST, believes that the success of the programme is linked to the growing interest of students and companies.

The aeronautical and space industries are a factor of technological development in any developed country and is therefore strategic for Portugal, says Fernando Lau, Professor of Aerospace Engineering at IST. This focus is more evident today, but it may not have been so clear when IST created a master’s degree in this field at the end of the last century. 'The creation of the integrated master's degree in aerospace engineering at the Instituto Superior Técnico in the last decade of the 20th century, which led to the current bachelor's and master's degrees in aerospace engineering, addressed the lack of training in this area in Portugal,' recalls Fernando Lau. The master’s degree in aerospace engineering has been a success in Portugal from the start, due to the growing interest of students and the demand of companies for their engineers.

Engineers trained in Portugal are internationally recognised, which is a result of the quality of the courses in this field. 'I can say without reservation that Portuguese university engineering education is of high quality. The link with industry is solid, both at the level of research projects and consultancy,' says Fernando Lau, citing the KC-390 development project as an example. This twin-engine aircraft, which can carry up to 74

Fernando Lau, Professor at Instituto Superior Técnico

stretchers or 80 passengers, was developed in collaboration with the CEiiA – Centre for Engineering and Development – and involved several dozen aerospace engineers.

Scientific knowledge has always been driven by the progress of the aeronautical industry, especially space exploration. 'Given the high technological level of the vast majority of aerospace technologies and the human and material resources involved, their viability necessarily requires the involvement of industry, academia and governments,' emphasises Fernando Lau. In short, the triple helix innovation model, which brings together academia, industry and governments, is essential for the development of the aerospace sector.

Among the various research projects developed in this area, Flexcraft stands out. This national project, involving Técnico, INEGI, SETSA of the Iberomoldes Group, AlmaDesign and Embraer, consisted of developing an aircraft that embodies the idea of modularity. The cabin can be reconfigured for different missions (commercial and leisure, rescue and assistance, among others), with STOL (short take-off and landing) capability to compete with rotorcraft solutions through short runway operations, improving overall performance.

Fernando Lau also mentions the Futprint50 project, where the team has identified and developed various technologies and configurations to accelerate the entry into service of a 50-seat hybrid-electric commercial aircraft by 2035-40. Finally, the ISTSat-1 project involves the development and construction of a 1U CubeSat and will be the first Portuguese CubeSat to be launched into space. It was developed by the ISTNanosat team, composed of students and professors from the Instituto Superior Técnico of the University of Lisbon, as part of the ESA's Fly Your Satellite! Program, explains Fernando Lau. They plan to launch it on the next Ariane flight.

ISQ

The Aerospace Lever

Present in the aerospace sector for more than 20 years, ISQ is sought out by numerous national and international organizations to carry out verification and qualification tests on equipment or technologies that will fly or orbit the earth.

In 2003, 20 years ago, an engineer from ISQ, a private entity that develops engineering, inspection, testing, and training solutions and services, took up a permanent position at the European Space Centre in French Guiana. It currently has a permanent team at the base, providing engineering services for the ground, launch and flight segments, including launchers and payloads.

In parallel, also around 20 years ago, ISQ began working with the European Space Agency on small technology development projects and engineering services. It later evolved into a relevant player in landmark projects, such as the IXV spaceplane prototype, which gave rise to the Space Rider vehicle, which will be in operation soon. Thus, it participated in the development of the reusable thermal protection system, which will allow the vehicle to make several re-entries into the atmosphere, as if it were a simple airplane.

ISQ has also invested in new skills and new laboratory equipment, enabling it to offer services in line with the needs of engineering companies and space vehicle manufacturers.

Today, its laboratories are highly sought after by national and international organizations. For example, in the field of aeronautics, it was responsible for a testing campaign for Embraer, in a technological demonstrator consisting of a wing built with composite materials for a new version of an E-jet family airplane. More recently, in 2023, he tested three satellites, one of which was the Portuguese satellite AEROS, which was successfully put into orbit.

For ISQ, the aerospace market is an international market focused on the supply chains of the European indus-

try, which has a more diversified and larger customer base.

But the experience it has gained in the aerospace sector gives it access to other equally internationalized markets with high added value. For example, the market for large international scientific projects developed by international consortia, which require the same type of skills, experience, and laboratory capacity as the aerospace sector. Some of ISQ's clients in this sector are CERN, ESO and ITER.

In Portugal, ISQ's most challenging and relevant project is the testing and qualification of the four satellite constellations that are being developed, assembled, and integrated in Portugal as part of the NewSpace Mobilizing Agenda. To this end, ISQ has invested in the development of its laboratories, particularly in the field of electromagnetic compatibility, structural tests and electromagnetic shaker tests that simulate the take-off effect of a rocket and the satellites it carries. In this way, it can access a market segment that was previously inaccessible.

Also, within the framework of the NewSpace Mobilizing Agenda, it will begin developing new digital services, with two technological pillars: Artificial Intelligence and Earth Observation Satellites.

In addition, ISQ will continue to work with multiple clients in the field of verification and qualification of systems and subsystems, as well as in support engineering for complex systems, not only in the sectors already mentioned, but also in others, with an emphasis on the technologies that will make it possible to decarbonize industry and the economy. This will certainly be one of the levers for the internationalization and sustainability of ISQ and Portugal. ●

isqgroup.com

Aernnova

Flights from Évora

Due to the growth of the aeronautics sector, in May 2022 Aernnova made its largest investment in 30 years. The company acquired two industrial plants from Embraer: ANN Évora Estruturas Metálicas, and ANN Évora Estruturas em Compósitos, both located in the Évora Aeronautical Industrial Park.

Aernnova is a leading multinational company in the design, manufacture, maintenance, and service of aerostructures, producing components for the world's largest aviation companies, such as Airbus, Boeing, Bombardier, and Embraer. Its investment in Portugal aimed to increase the production capacity of these two industrial plants in Évora and diversify its customer base and products. The facilities in Évora currently represent the Aernnova group's largest source of revenue and the largest unit in terms of number of employees.

The reasons that led Embraer to build in 2008 two units specializing in the production of metallic and composite materials in Évora and Portugal were the same as those that led Aernnova to decide to acquire the company: people and geographical location.

The two centers of excellence stand out for their high technological and automation component that complies with the most modern principles of the LEAN philosophy. They have ample space for handling large parts, are prepared for high series production rates, and have great flexibility to respond to market demands, which was an important step in the Group's growth strategy.

This strategy has consolidated a key position in three types of aeronautical markets: Executive, Commercial and Defence, through critical programs with significant growth potential, such as Praetor, E1, E2 and KC-390.

The industrial capacity of the Évora plants will allow Aernnova to expand its current activities further through new contracts with Embraer and other aircraft manufacturers.

Since the completion of the acquisition process, the company has seen an increase in turnover of around 45 per cent, reaching a turnover of 152 million euros in 2023. In turn, the workforce has increased by 73 per cent, reaching 846 employees by December 2023.

Today, Aernnova's objectives in Évora are to have effective selection, retention, and qualification processes in the short term to exceed the target of 1000 employees and consolidate its position as the largest private-sector aeronautical production industry on the Iberian Peninsula within three years.

Due to the growing demand projections for the projects already developed, namely the significant increase in orders for executive aviation and the prospects for incorporating new projects and clients, Aernnova Évora is on its way to becoming a world reference in the aeronautical sector.

aernnova.com

Airbus

A320 success also comes from Santo Tirso

Three years ago, Airbus Atlantic chose Portugal to set up a new factory in Santo Tirso, where it began producing fuselage panels for the A320 and A350 aeroplanes. By the end of 2023, the factory already employed 240 people, and this year, it will receive two more components for the A320's forward fuselage. For the company's CEO, Eric Belloc, 'supporting this increase in production is a priority'.

The Airbus plant in Santo Tirso opened in September 2022 and has quickly become one of the leading aeronautical references in Portugal. 'The results are positive. We have achieved our growth targets – 240 jobs by the end of 2023 – and our investment targets. We continue to expand and should have around 330 employees by the end of 2024,' predicts Eric Belloc.

Airbus' success in Portugal is directly related to the success of the A320 family of aircraft, whose production continues to increase. For this reason, the Santo Tirso factory will receive two other components for the front fuselage of the aeroplanes later this year.

In the aeronautics sector, skills and specialised technical training are crucial. Shortly after setting up the factory, Airbus Atlantic partnered with the Training Centre for the Metallurgical and Metalworking Industry (CENFIM), under which 23 courses have already been held, training around 450 people.

'We are very satisfied with the results. This partnership is crucial to meeting the plant's ongoing growth challenges,' emphasises Eric Belloc.' When we needed to increase the number of people trained, CENFIM was there. As with any partnership, we must regularly question ourselves to optimise our service. That's what we're currently doing, in collaboration with CENFIM, to make the most of the results of these three years of working together.'

From the outset, Airbus Atlantic has endeavoured to attract talent and demonstrate the company's attractiveness to all its professions. 'We decided to offer open-ended contracts from the training stage to attract

talent from the industrial world,' explains Belloc. On the other hand, the company finds arguments that justify its success as one of Portugal's leading investments in the aeronautics sector in its history. 'Working at Airbus Atlantic means contributing to developing one of Europe's greatest success stories of recent years.'

The entire ecosystem of companies somehow linked to the aerospace sector is also growing around Airbus. The company works directly or indirectly with the Portuguese network of suppliers in this area, such as Lauak and Nexteam.

Parts suppliers often deliver to France. 'For general purchases, where Airbus Atlantic Portugal is autonomous, we try to work as much as possible with companies based in Portugal,' says Eric Belloc. 'Unfortunately, this doesn't apply to all business areas, although the network is growing month on month, demonstrating the attractiveness of Portugal and the dynamism of the country's aerospace sector.

Choosing Portugal to build the new factory was also related to the network of Portuguese suppliers and the quality associated with them. 'Portugal's competence in the industrial sector is widely recognised, and this was an essential factor,' concludes the managing director of Airbus Atlantic Portugal. There were also other factors, such as location. 'The proximity of the French facilities is an advantage since the proximity of the ports facilitates logistical operations – there is an agreement with Viana do Castelo – and the road infrastructure.'

airbus.com

BeyondComposite

Creating lightweight and high-performance materials

BeyondComposite is a Portuguese company established in 2018, specialising in advanced composite materials. It was founded by researchers from the University of Minho with the aim of developing lightweight and high-performance composites.

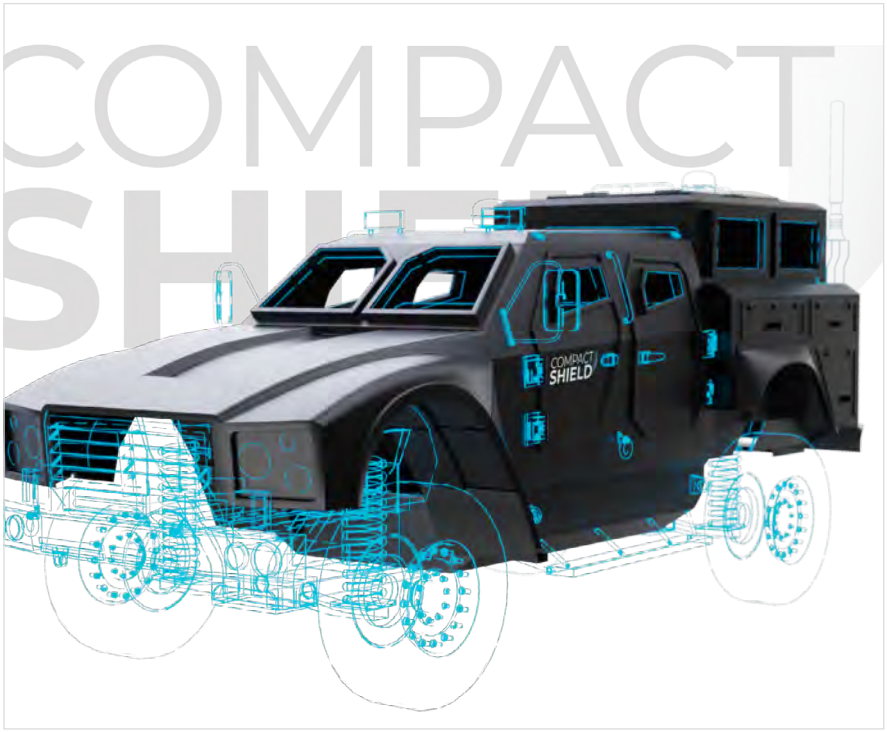
Multiscale composites, gradient composites and sensory composites may seem complex, but they primarily refer to the lightweight and high-performance materials in which BeyondComposite specialises. The company's key sectors are defence, aerospace and mobility, and it aims to be a leading reference in this field.

In addition to its presence in the defence and aerospace sectors, BeyondComposite also produces composite components for public transport, including trains and buses. 'The so-called eco-composites, which are lighter and more sustainable, are not just a trend, but an urgent necessity to increase vehicle autonomy with eco-friendly materials, in order to build a more sustainable and prosperous future,' emphasises Fernando Cunha, CEO of BeyondComposite.

In partnership with SONAE's Surfoma, BeyondComposite has strengthened its position in the ballistic protection industry for the defence sector by using a combination of varied materials, marking a significant milestone in high performance ballistic protection. This technological advancement also has applications in the mobility and construction sectors. In the mobility sector, besides adaptable ballistic protection as needed, it allows for a considerable reduction in the weight of the transport medium, resulting in greater mobility and autonomy.

Conversely, in the construction sector, this solution can be incorporated into several types of buildings such as police stations, banks and schools. These panels can also be used in decorative elements such as doors, tables and counters, providing additional protection in threatening situations.

These innovative ballistic panels have been developed using multi-layer composite fibre structures combined with nanotechnology, which allows the creation of a high-performance, lightweight product, explains Fernan-



do Cunha. This innovation gave rise to the CompactShield brand. 'This ballistic protection product not only has the technical ability to protect against ballistic threats, but also offers the possibility of having decorative and functional finishes, depending on the type of use.'

The growing demand for ballistic protection solutions justifies the need for innovation in this area. This is why BeyondComposite is committed to developing composites for anti-ballistic protection, one of the key differentiators from international competitors.

By investing in development, the company can offer tailor-made solutions to meet customers' specific needs, which is a significant competitive advantage. The ability to innovate and adapt quickly to market changes, combined with product quality, distinguishes BeyondComposite on the global stage.

The company is also well placed with its production capacity of 500m² of composite ballistic solution per day. This capacity not only meets high demand, but also ensures consistency and speed of delivery. By combining innovative technology, continuous innovation and operational efficiency, BeyondComposite aims to lead the global ballistic protection market.

'The business outlook is very promising, driven by the growing demand for ballistic solutions, motivated by increasing global threats and the growing need for security in sectors such as defence, public safety and civil protection,' says Fernando Cunha. To meet this demand, the company foresees the need to expand its team by hiring new talent in development, engineering, production and sales, as well as investing in the ongoing training of its employees. The company also plans to increase its presence in international markets and open offices in strategically important regions.

beyondcomposite.pt

Beyond Gravity

The goal is to be the largest aerospace engineering company in Portugal

Founded four decades ago and with around 1,800 employees spread across 14 offices in 7 countries (Switzerland, Sweden, Austria, Germany, USA, Finland and Portugal), Beyond Gravity generated revenues of CHF 383 million (388 million euros) in 2023. In November 2023, the company opened the Innovation & Digital Hub in Lisbon, which supports the company's growth in the areas of technology, engineering and various support functions, such as human resources and finance.

Based in Zurich, Switzerland, Beyond Gravity develops and manufactures products for satellites, launch vehicles, and the semiconductor industry. Its goal is to enable the exploration of the world… and beyond. This global startup combines agility, speed, and innovation.

Investing in the Innovation & Digital Hub in Lisbon aims to strengthen Beyond Gravity's leading position in the space industry. 'It will allow the company to grow further, through a stronger international network, and to advance emerging technologies such as Artificial Intelligence, building up the company's entire digital and technological structure', says Mario Vidal, Transformation Director of Beyond Gravity who will assume the position of Managing Director of the company in Portugal next month.

Its presence in Portugal will also strengthen the company's competitiveness through access to talented and qualified professionals. 'Portugal, and Lisbon in particular, offer ideal conditions due to the top space engineering and technology universities, the high attractiveness of the location and the dynamic startup environment', says Mario Vidal.

By the end of 2025, the company aims to employ more than 200 people at its facilities in Lisbon and is committed to promoting a culture of innovation. Its goal is to become a benchmark employer and the leading aerospace engineering company operating in Portugal. The skills and profiles it seeks in Portugal are diverse and range from Technology and Engineering to support functions such as Finance and Human Resources. It also plans to open new offices in Lisbon in the third quarter of this year.

Beyond Gravity invests heavily in its digital transformation, including cre-

ating a digital core, standardising its systems landscape, harmonising its global processes, and creating a solid database. The Innovation & Digital Hub in Lisbon supports this transformation and promotes global engineering innovation and collaboration between the company's 14 offices.

Beyond Gravity's main objective is to transform itself into an agile company with a startup mentality. This will allow it to exploit market potential, particularly in the commercial sector, which is characterised by larger volumes, shorter production cycles, and higher demands on cost efficiency.

To manage its growth cost-effectively, Beyond Gravity has invested in expanding, modernising, automating, and increasing development towards series production at its production sites in Linköping (Sweden) and Decatur (USA), doubling production capacity at both locations. This development is supported by the skills in various areas the company recruits in Portugal.

In the coming years, Beyond Gravity intends to continue investing in research and development, expanding its production capacities, and extending its leading market position.

Currently, the company's growth is especially materialising in the commercial space market, such as the production of dispenser systems for Amazon's Kuiper constellation. This initiative aims to improve global broadband access through a constellation of 3236 satellites in low earth orbit. The project aims to bring affordable high-speed broadband to underserved areas worldwide. In addition, it will supply the structures for 38 Vulcan launch vehicles from United Launch Alliance, the US rocket manufacturer, which will carry part of Amazon's Kuiper constellation into space.

In this way, Beyond Gravity is doubling its production capacity in the US and Sweden. It recently inaugurated its new production facility in Decatur, and the new facility in Linköping is scheduled to open later this year.

beyondgravity.com

Critical Software

Technology for systems that cannot fail

Founded in 1998, Critical Software is a multinational technology company specialising in developing software solutions and providing engineering services to support critical and reliable systems. The company collaborates with international clients in sectors as diverse as aeronautics, space and defence, energy, finance, e-commerce, medical devices and transport.

Critical Software plays a crucial role in the aerospace industry, providing advanced technological solutions promoting safety, efficiency and innovation.

With teams possessing core knowledge and competencies in systems engineering, the company specialises in developing embedded software for critical systems. It also excels in verifying and validating software and equipment, carrying out RAMS (Reliability, Availability, Maintainability, and Safety) analysis, alongside other safety and security analyses. It also ensures compliance with specific strict standards, offering support for the certification and qualification of aerospace systems.

Critical's involvement in aerospace has seen participate in the specification, development, verification and validation of various components critical to aircraft operation, including certification for airworthiness. It has been part of several avionics projects, from the development of systems for flight computers to building other systems for clients such as Airbus, GE Aerospace, CMC Electronics and Liebherr Aerospace. It has supported the development of different human-machine interfaces (HMI) and displays, from Cabin Management Systems to Cockpit Displays. It has also supported the certification of operating systems for critical ap-

plications for market leaders such as Wind River.

Meanwhile, in the defence and security industry, Critical offers technological solutions that support various critical missions, such as peacekeeping operations, search and rescue, and training and simulation solutions. Its teams specialise in building mission support software, including embedded software, applications and commercial solutions. Companies in this sector face significant challenges and require reliable tools, especially in the most demanding situations.

Cyber security and artificial intelligence

Critical has invested significantly in cyber security and artificial intelligence (AI), ensuring its products stand at the forefront of innovation and protection from online threats.

In this area, it has participated in the development of new systems through software solutions, testing, verification, and validation and has been involved in the development of cutting-edge products and solutions enabling Rohde & Schwarz customers (industrial, regulatory and military entities) to have technological and digital sovereignty and has been a partner of the Portuguese Armed Forces in various projects. These include the Battlefield Management System, a command and control system for the Portuguese Army; the Portuguese Sky Sentinel System, a system allowing aircraft positions to be tracked in real-time; and Oversee, an information system developed to support the Portuguese Navy's maritime security operations.

In the space industry, Critical develops solutions for commercial and scientific missions, human and robotic exploration and position-time-navigation technologies. It has worked with start-ups, helping to create business models, and with international agencies and major players in the sector, supporting monitoring of human activity and its impact on the planet. The projects range from ITER, the largest international scientific project aimed at demonstrating the viability of nuclear fusion as a clean and unlimited energy source for the future, to the Copernicus Earth observation programme, for which it handles on-board software development enabling data to be obtained on the impact of human activity on the environment and compliance monitoring with regards to the Paris Agreement.

In 2018, Critical Software formed a joint venture with the BMW Group: Critical TechWorks. The venture remains dedicated to developing the next generation of software systems for BMW vehicles, revolutionising the way we use cars – from autonomous driving and electrification technologies to connectivity solutions and innovative on-board systems.

The aerospace sector is in the process of becoming more sustainable – a challenge to companies to accelerate innovation. Critical Software has jumped at this challenge to enhance its skills, reach new heights, and promote a more sustainable and safer future for the entire planet.

criticalsoftware.com

EEA

The strenght of aeronautics in Portugal

The Empresa de Engenharia e Aeronáutica (EEA, Engineering and Aeronautic Company) is the leader of Aero.Next Portugal, a Mobilizing Agenda that brings together 36 entities and aims to develop, industrialize and operate from Portugal, a complete aeronautical programme that will place the country on the restricted map of players that are final integrators of aircraft, becoming involved in the entire value chain, from design and engineering to post-production services (MRO).

EEA is responsible for the most significant investment in the Agenda that includes the following products: a light regional aircraft – the LUS-222, and two unmanned aircraft – ARX, a maritime and coastal surveillance drone, and ET15, a drone to transport medical supplies in an emergency context.

The historical relationship between the members of the consortium and the scientific, technical, financial and management skills have been indispensable for a project of this magnitude. On the other hand, EEA is very experienced in this sector, namely through its participation as the contract managing entity for the KC-390 and holds the intellectual property for the components of the aircraft that Portugal developed, in which it managed a complex process that involved public entities, Embraer, CEiiA, Ogma and more than 30 companies.

The LUS-222 is the main product of the Aero.Next Portugal Agenda: 'LUS' stands for Luso or Lusitanian, and '222' refers to its two engines, 2,000 km range and 2,000 kg cargo capacity. It is an aircraft with civilian and military versions that stands out

for its ability to be converted into different types of missions: transporting up to 19 passengers and cargo of up to 2,000 kg for military operations and humanitarian and emergency transport.

All the aircraft's engineering has been developed and led by CEiiA – Centro de Engenharia e Desenvolvimento de Produto, since 2022, which already has more than eighty engineers working exclusively on this program at its hub in Évora. At the end of this year, it will begin the construction of the Final Assembly Line (FAL) at the Ponte de Sor Municipal Aerodrome, which will provide the Alentejo region, and Portugal, a factory to produce light regional aircrafts.

Regarding the market, this is an unique opportunity to bring an aircraft like the LUS-222. In addition to its distinctive characteristics compared to other light regional aircrafts the timing to start producing LUS-222 is in line with the end of the useful life of aircrafts of the same segment, currently in operation. This is particularly important as the major aircraft manufacturers (Airbus or Embraer) have stopped producing aircrafts in the same segment to focus on larger aircrafts, leaving a gap of more than 5,000 aircraft to be replaced over the next 15 years.

From a more precise point of view, LUS-222 is an aircraft that, in its civilian version, is essentially intended for the markets of South America, North Africa and Southeast Asia, to provide an alternative to ground transportation, which is often difficult and time-consuming. In the military version, the armed forces of the countries in the same regions, particularly those that currently operate the C-212, as it is an "all-terrain" aircraft capable of landing on very short and unprepared runways. Additionally, the hourly flight and maintenance costs will be much lower than other aircraft while ensuring maximum mission performance.

With the LUS-222 program, EEA is strengthening and extending the national aeronautical value chain in the critical stages of aircraft development, that are better paid and more technologically intensive. It also contributes to a progressive change in the productive specialization in Portugal through greater sophistication in the development of knowledge, technology, and innovation in line with the National Strategy for Intelligent Specialization associated with more sustained and lasting economic growth linked to aircraft's life cycle and operation.

Implementing the LUS-222 program will optimize investments made in Portugal over the last ten years. This program was a safe bet from EEA was as this program was already being planned and implemented before there was a Resolution and Resilience Program. The Mobilizing Agendas for Business Innovation have accelerated and boosted existing resources and assets, created by investments made over time, particularly in the Alentejo, where new qualified and well-paid jobs are being created, contributing to significant strengthening of territorial cohesion.

aeronextportugal.pt

EID

Innovation in military communications

It was back the 1980s when a team of electronics and telecommunications engineers working for a private Portuguese industrial group decided to create a company dedicated to innovation. EID, Empresa de Investigação e Desenvolvimento de Eletrónica, was born. Today, the company specialises in military communications used by armed forces around the world.

EID supplies equipment to 35 armed forces worldwide. Its average sales volume is around 20 million euros, and the company is already a world reference in military telecommunications. It has more than 300 national suppliers and invests more than 10 per cent of its turnover in research and development activities.

In 2016, EID was acquired by Cohort, a UK technology group, enabling it to extend its offer to defence and security customers worldwide. Cohort and other shareholders, such as the IoD and IAPMEI, reinforced the company's commitment to expansion.

EID is the leading Portuguese company in complex military voice and data communications. It is in the world's top five in terms of communications systems between land and sea military vehicles. In addition to its strong export component—around 60 per cent of its production is for export—the company has also excelled in several innovative Portuguese Navy and Army projects. This is the case with the 'Soldier System', which allows voice, IP data, and video to be transmitted between military personnel, regardless of where they are.

Defining itself as a one-stop shop for military communication solutions, EID has over 130 employees, around 50 per cent of whom have engineering skills. Its commitment to research and

development, combined with its accumulated experience, has allowed it to establish partnerships with the Portuguese government and other countries in areas such as cyber-defence.

At a time when investment in defence is expected to reach 2 per cent of GDP by 2030, EID can add value to the sector in Portugal and strengthen its global positioning.

The first steps before European accession

When it was founded in 1983, the EID enjoyed the support of the Portuguese government. The world was still recovering from the 1979 oil shock, and Portugal embarked on an International Monetary Fund intervention programme to stabilise the economy. Despite this challenging context, the EID was built by an electronics and telecommunications engineering team. With the support of the Portuguese Ministry of Defence, this team took on the challenge of developing a range of communications products for the modernisation of the Armed Forces.

During the 1980s, the company began two important development programmes: the PRC-425 tactical VHF transceiver and the first generation of the Integrated Communications Control System (ICCS), designed to automate and manage communications on warships.

In 1986, the company supplied the integrated command and control communications system for the Vasco da Gama frigates, one of the Portuguese Navy's most essential modernisation programmes. The company also began to explore the area of programmes stored on field telephones and digital switching technology.

In 1987, EID launched the CX400, a digital PABX entirely developed by

Portuguese engineers, and completed the development of the ICC-101, an intercom system for armoured vehicles. A year later, the company invested in surface-mount technology (SMD), which led to a significant technological leap in manufacturing and product miniaturisation.

Solutions for the armed forces of several countries

In 1991, the company designed and launched the smallest and lightest military VHF portable radio on the market, the PRC-501, which was widely used by Portuguese troops on NATO peace missions and adopted by the Brazilian army.

Around this time, the company began internationalising, with its systems used by the armed forces of Brazil, the Netherlands, and Spain. The PRC-501 was adopted by the Brazilian army, and its technology was even transferred to a NATO partner country. Ten years later, in the 2000s, the company began supplying communications systems to the Dutch and Spanish navies.

Market diversification continued, with significant contracts signed with the armed forces of Malaysia, Egypt, Bangladesh, Bahrain, and the United Arab Emirates. In 2012, the navies of Australia, Malaysia, and Indonesia also became clients. In 2013, EID expanded its presence in the Asia Pacific region with the opening of an office in Kuala Lumpur to develop new opportunities for collaboration and business in that region.

eid.pt

Geosat

Observing the Earth to care for the territory and its people

Geosat is an Earth observation company that sells images and information worldwide. With its high-resolution satellites, it is one of the two leading European operators of optical satellites.

Geosat's images and information are used for scientific purposes, land management, economic development, helping populations adapt to climate change and supporting operations in extreme scenarios. With an entirely Portuguese shareholder structure, the company has a team of 60 people in Portugal and Spain who manage the entire value chain of its products and services, from satellite operations to image processing and analysis by analysts and artificial intelligence tools.

Geosat has accelerated Portugal's entry into the commercial Earth observation market by 5 to 10 years, taking advantage of continuous experience in product and service delivery. Satellite imagery and derived information are already familiar in several markets, although global adoption of this technology is still in its early stages. These images are used in several areas.

Satellites provide relevant information for precision agriculture and crop health analysis and contribute to irrigation and fertilisation strategies. Combined with early detection of variations in crop development, this knowledge increases productivity and reduces costs. Land management benefits from additional information for planning urban expansion, buildings, road networks, and public services, as well as for detecting and analysing changes over time.

In disaster relief, satellites facilitate monitoring of affected areas and real-time information updates. In this context, Geosat has contributed data to the International Charter: Space and Major Disasters, an agreement to provide satellite services to humanitarian organisations during a disaster.

These sectors are forerunners of other markets beginning to explore space technology, which is one of the main trends in the space sector. Initially, an institutional sector in which only large economies could have assets, it has expanded over the last few decades to include business users as a result of cost reductions driven by technological developments, with future prospects for expansion to end users in a trend known as New Space.

Following this trend, Geosat is preparing to operate a new generation of satellites that will provide higher-resolution imagery, more frequent data, new types of sensors, and greater integration with artificial intelligence tools. This will improve the ability to

produce large-area maps and monitor areas of interest on a daily basis around the world.

In this process, Geosat has been involved in several initiatives to develop the Portuguese technological and industrial ecosystem. These include the Portuguese component of the Atlantic Constellation, which has been extended to include the Portuguese Air Force, thus strengthening sovereignty over the national Exclusive Economic Zone (EEZ). The provision of 2023 coverage of Portugal accelerates the development of analysis applications and tools by national companies and research centres as part of Geosat's partnership with CEIIA—Centre of Engineering and Development.

New Space Portugal to develop a new generation of products

In parallel, Geosat has spearheaded and led the New Space Portugal mobilisation agenda, funded by the Recovery and Resilience Programme. The agenda involves around 40 companies, research centres and institutions to develop a new generation of space products and services and transform the profile of national industrial specialisation.

New Space Portugal aims to accelerate Geosat's global positioning strategy by supporting the development of satellites for its next constellation in Portugal, and other agenda promoters are leading sub-projects to develop complementary maritime communications or radar satellites. In addition, the New Space Portugal agenda aims to increase Portugal's capacity beyond the launches planned for next year, to ensure the technology and innovation required for the next generations of satellites, and to attract talent for a sustainable ecosystem of space products and services. ●

geosat.space

GMV

Technological innovation for crucial challenges

GMV is a multinational technology group founded in 1984. It has a solid presence in various sectors, including aeronautics, defense and security, cybersecurity, space, intelligent transport systems, among others. It has headquarters in 12 countries and is present in around 80. The company's history in Portugal began in 2005 and has been marked by innovation, a focus on niche markets, and internationalization.

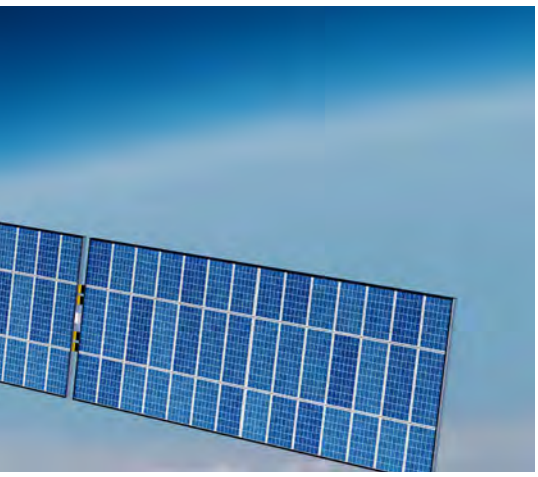
GMV provides consultancy and engineering services, software and hardware development, systems integration, maintenance, and operational support. In 2005, it decided to expand its operations and invest in Portugal, attracted by the country's favorable environment for technological innovation and the talent available in engineering and science.

In Portugal, its evolution has been marked by innovation, research and development, specialization in niche markets and internationalization, diversification, and sustainability.

GMV Portugal has stood out for its work in innovative technological systems and solutions for its sectors of operation.

In the Defense sector, GMV provides advanced command and control solutions, surveillance and reconnaissance systems, and electronic warfare technologies. It also develops cybersecurity systems to protect critical infrastructures and sensitive information against digital threats.

In the context of aeronautics in Portugal, the company has created one of the most modern operating systems for this industry, following the highest certification standards, RTCA DO178C level A. This development gives GMV a unique position in a ra-



pidly transitioning global ecosystem. The use of artificial intelligence (AI) for unmanned aircraft landings has also been one of the embedded systems team's bets, with demonstration flights of the technology taking place in 2022 and 2023.

The defence sector requires investment in emerging technologies, and one of the examples developed by GMV is the Maritime Unmanned Anti-Submarine System (MUSAS). This system involves an advanced command, control, and communications architecture for anti-submarine warfare, using AI to combat threats in this sector more efficiently. In addition to MUSAS, GMV has applied emerging technologies such as Augmented Reality, AI, and even the Metaverse to the defence industry, both on the ground and in the air, where it also promotes the certification process.

The project led by GMV Portugal – Cyber Resilience for the Air Domain and Investigation of the Feasibility for an Aviation Cyber Exercise (CRUCIAL HINTS) – is an essential step for GMV in analyzing cybersecurity challenges specific to the Air Domain. Also on the cybersecurity spectrum is the ACTING project, which aims to create an advanced and flexible cyber training platform. In the realm of cockpit technology for combat aircraft, the EPIIC project aims to guarantee cooperation between systems and pilots.

In the space sector, the GMV Group is Europe's 6th largest employer – with essential centers of competence in Portugal – and has institutional clients, the main one being the European Space Agency (ESA), in coordination with the Portuguese Space Agency, but also EUMETSAT, EDA, the European Commission/EUSPA/EDF/EMSA, the Armed Forces, and other national agents. It is also the world's leading supplier of control centers for the commercial satellite telecommunications segment.

In Portugal, it develops command, control, and satellite data processing solutions, as well as surveillance and space situational awareness, to mitigate the dangers of satellite collisions and other threats. For example, GMV's team in Portugal is working with ESA and NASA on the HERA mission to test a defense system against asteroid collisions.

In Earth Observation, GMV is a leading provider of Copernicus services and has supported various crisis scenarios with images and analyses of affected areas. In the field of Satellite Navigation, GMV is involved in the operational systems, development, and testing of the Galileo system, particularly in key technologies for the use of Low Earth Orbit Satellites for Positioning, Navigation, and Timing.

GMV's global goal is to continue the double-digit growth of recent years. In Portugal, the company wants to continue accompanying this growth, integrating, and leading important projects and developing solutions and projects for clients all over the world. It maintains specialized niches and centers of excellence in Lisbon, which boosts Portuguese engineering and contributes to the worldwide affirmation of its technology.

GMV Portugal exports more than 75 percent of its turnover and, with a national presence nearing 20 years, remains committed to attracting top talent and providing the best opportunities for its employees.

gmv.com

Lauak Portugal

A history of innovation in the aeronautical industry

The Lauak Group, a family-owned company founded in France in 1975, is a benchmark in the aeronautics sector, distinguished by its capacity for innovation and global expansion. It opened its first factory in 2003 and a second in 2018, reinforcing its presence in the Portuguese and European markets.

Since its foundation, the Lauak Group has specialised in the manufacture of metal components for aircraft, serving some of the largest companies in the sector, such as Airbus, Dassault, and Boeing. In 2003, the group began operations in Portugal with a plant in Palmela, which was later relocated to Setúbal. Five years later, it opened a second plant in Grândola, increasing its production and innovation capacities.

The Lauak Group's history began in the southwest of France, in Hasparren, near Biarritz, with a small workshop dedicated to the production of metal parts. Over the decades, the company has expanded its operations with new facilities and technologies to meet the growing demand of its customers in the aeronautical industry. Today, the group has ten production sites around the world, including Canada, Mexico, India, and Portugal.

Lauak's commitment to Portugal is now 20 years old. It began with a 3,000-square-metre production unit where 28 people worked. There were only two clients, OGMA and Aernnova. Growth was rapid, and in 2008, the company moved to the Blue Bizz Global Parques premises, where it is today.

After the financial crise of 2008 and 2009 and in view of the upturn in the global aeronautics industry, the group decided in 2018 to proceed with the construction of the plant in Grândola with the support of European funds. In the period leading up to this investment, Lauak Portugal recorded an average annual growth of 33 per cent.

This investment aimed to strengthen production capacity in Portugal and Europe while maintaining proximity to major European manufacturers. The new plant has been equipped with state-of-the-art technology for manufacturing metal components, respecting the strictest standards in the aeronautical industry.

Innovating using robotics and 3D printing

Lauak Portugal has adopted various innovations in its manufacturing processes, including advanced robotics. It is also consolidating a metal and polymer 3D printing department, aiming to increase production efficiency and create lighter and more resistant structures, which are fundamental for improving aircraft performance and safety. Lauak Portugal has also collaborated with various national and international universities and research centres to develop innovative solutions and improve its processes.

Sustainability is also a priority for the company, which has endeavoured to manage resources efficiently and reduce carbon emissions. The days of a small unit with 28 workers are long gone. Today, there are more than 800. The company has grown, and with it the concern to provide an inclusive working environment and the professional development of people. To this end, a protocol has been established with the Portuguese Institute for Employment and Vocational Training (IEFP).

The focal challenges today are the constant need for innovation, the efficient management of supply chains and the adoption of measures to keep up with changes in the global market. This is a necessary path for the company to continue to stand out and supply the main European aeronautical manufacturers, such as Airbus, Dassault, Dauer Socata, Liebherr, or Stelia, and to strengthen its position in other international markets with Embraer, IAI, Bombardier and Boeing. ●

groupe-lauak.com

Lusospace

A beacon for the global space industry

Founded in 2002 by entrepreneur Ivo Yves Vieira, who had already made his mark with the PoSAT-1 project (the first-ever Portuguese satellite), LusoSpace was poised to become Portugal's first beacon in the burgeoning global space industry.

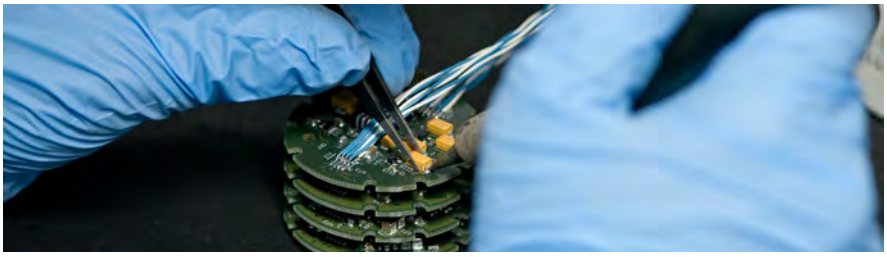
The story of LusoSpace is a testament to its pioneering spirit and relentless pursuit of excellence. With more than 20 engineers, LusoSpace grew in capability, developing new, cutting-edge technologies like photonics for space-based applications and demisable magnetometers, new optical systems and laser communications that have become crucial in modern satellite and ground operations.

Adhering to the European Space Agency (ESA) standards, LusoSpace offers digital and analogue magnetometers, magnetometers (AOCS), optical communications (Laser heads), sun simulators, and optoelectronics, which are systems for measuring and controlling laser stability in frequency and output power.

Regarding services, LusoSpace offers Augmented Reality (AR) and Mixed Reality (XR), including a conceptual study of a Head-Mounted Display for astronauts. It also provides real-time systems for assisting multidisciplinary engineering teams in concurrent activities.

By 2024, LusoSpace had participated in over 30 missions, including the prestigious Sentinel-5 project, highlighting its integral role in Europe's and ESA's aerospace achievements.

Within the confines of LusoSpace's high-tech laboratories and ISO-certified clean rooms, magic happens.



Engineers and aerospace scientists work in environments that rival the sterility of space itself, crafting components that will operate flawlessly in the void, and assembling and testing equipment in sun simulators, extreme temperatures, and radiation.

These clean rooms have advanced testing equipment that can simulate the harsh conditions of space, ensuring that every component is battle-evaluated for its journey above.

LusoSpace's journey is not a solitary flight, even though the space is enormous. Through strategic alliances with giants like Airbus, Thales, OHB, and more, in close relationships with PT Space and ESA, and participation in groundbreaking projects like the AIS/VDES constellation with the New Space Portugal, LusoSpace has created a network of partnerships that span atmospheres.

The AIS/VDES constellation is a remarkable leap in maritime communication technology – called VHF Data Exchange System, It is designed as a hybrid system that includes terrestrial (VDE-TER) and satellite (VDE-SAT) components, enabling global maritime communication coverage, increasing bandwidth and data rates, global coverage in over open oceans, enhanced security with encrypted channels and finally offering a two-way communication system for emergency responses or coordination between ships of shore facilities.

As LusoSpace looks to the skies, its path aligns with the trajectory of the evolution of the aerospace industry. With the space economy expanding and Europe's defence needs escalating amidst geopolitical tensions, LusoSpace is at the forefront, ready to meet these challenges with innovation and expertise and aims to expand its influence in the industry, driven by a commitment to sustainability and exploring new technological frontiers.

Recent increases in defence spending across Europe present new opportunities for LusoSpace to contribute to regional security architectures, reinforcing its role in a rapidly transforming sector. ●

lusospace.com

Neuraspace

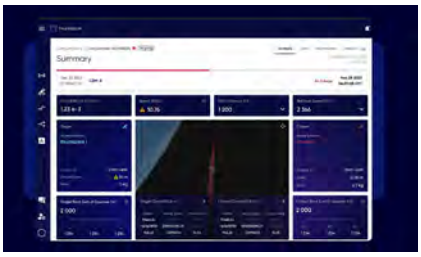
AI for space traffic management

Neuraspace was founded in 2020, headquartered in Coimbra, and incubated at Instituto Pedro Nunes. It has developed a comprehensive space traffic management solution and currently operates globally with offices in Lisbon, Munich and Luxembourg. It creates the tools a satellite operator needs to guarantee secure and sustainable access to space.

Founded by Nuno Sebastião, who began his career at the European Space Operations Centre of the European Space Agency (ESOC-ESA) and later co-founded Feedzai, a fintech unicorn that applies machine learning algorithms to fraud detection in financial services, Neuraspace aims to optimize space traffic and debris management through Artificial Intelligence – AI, ensuring safe, secure and sustainable space operations.

The company's products and services include real-time automated Space Traffic Management (STM), which enhances situational awareness and collision avoidance. Mission Support Software provides advanced tools for planning and executing space missions efficiently. Finally, data-as-a-Service delivers comprehensive space situational awareness data. These capabilities enable the company to process vast amounts of data, automate operational processes and provide valuable insights to its clients.

Its STM solution is built on three main pillars: Data Fusion, which integrates data from various sensors, including optical, radar, laser and GNSS receivers, to improve object tracking and collision prediction; Proprietary AI and ML Algorithms, Utilized for predicting object uncertainty, assessing collision risks and optimizing manoeuvres; and finally, Automation, which reduces



manual intervention, enhances resource use and supports multi-orbit and multi-asset systems.

Neuraspace, which currently manages over 300 satellites, has clients such as Spire (which uses the STM platform to monitor a constellation of over 100 satellites, benefiting from automated conjunction alerts, suggestions for collision avoidance manoeuvres and advanced conjunction analysis), Nanoavionics and the European Space Agency (ESA), whose satellites are monitored by the Neuraspace platform, ensuring their safety and operational efficiency amidst the growing challenges of space debris and traffic. In February 2022, the company secured a 2.5 million euro investment from Armilar Venture Partners to boost its growth and innovation.

Neuraspace has raised financing for sensor infrastructure and its growth strategy with the support of the Recovery and Resilience Plan (PRR) and NextGeneration EU Funds. With this 25 million euro contract, Neuraspace now takes a decisive step to establish itself as a critical player in the STM market. The 'AI Fights Space Debris' project aims to contribute to the Neuraspace Space Traffic Management Platform.

Within the PRR project, it is planned to develop all the necessary tools for a satellite operator to perform space operations and maintain space access safety and sustainability. These tools will be available through Neuraspace's platform as a stand-alone product or in an integrated suite, providing higher added value.

Neuraspace has partnered with Elecnor Deimos and other partners to enhance debris-tracking capabilities by incorporating data telescopes, further strengthening our data fusion model. This collaboration enables more accurate analysis and better collision avoidance guidance, contributing to the safety and sustainability of space activities.

The Neuraspace mobile SST Optical Telescopes offer fully deployable, remote-operated systems that capture accurate astrometric and photometric data. These systems are being deployed in Portugal and a strategic location in the Southern Hemisphere, complementing existing European LEO tracking capabilities. ●

neuraspace.com

OGMA

A century of experience looking to the future of aeronautics in Portugal

More than a century of history in the Portuguese aviation sector has passed through OGMA – Indústria Aeronáutica de Portugal. It has a past linked to aircraft maintenance and a future that includes participation in some of the world's most important aeronautical programmes, providing services to manufacturers such as Embraer, Airbus and Lockheed Martin.

OGMA – Indústria Aeronáutica de Portugal was founded on 29 June 1918 and is an international benchmark in the sector. As a result of its century-long experience, the company has participated, decade after decade, in some of the world's most important aeronautical programmes. It supports leading international operators in civil aviation and defence.

The Airholding consortium holds 65 per cent of OGMA's share capital, made up of Embraer, with the Portuguese state holding the remaining 35 per cent through idD-Portugal Defence. Historically, OGMA's activity has been organised into two business areas: aircraft, Engine, and Component Maintenance, which accounts for 70 per cent of its activity, and Aerospace Manufacturing and Assembly, which accounts for the remaining 30 per cent of its business.

In the area of maintenance, OGMA is a true one-stop-shop; in other words, customers will find a team, technologies and facilities that allow them to carry out simple or heavy maintenance on commercial or defence aircraft in a single location, maintenance on engines and components such as landing gear, propellers, brakes, avionics, hydraulic and electromechanical components, among others, as well as painting, modifications or systems installations.

Regarding aviation, OGMA brings together qualified professionals with the know-how to carry out maintenance on civil and defence aircraft. 'These are segments with their characteristics, which are reflected in how maintenance programmes are carried out, taking into account the characteristics and specificities that differentiate a civil aircraft from a defence aircraft,' explains Nuno Coutinho, OGMA's Director of Institutional Affairs. As an Authorised Maintenance Centre for Embraer, Lockheed Martin, Rolls-Royce, and Pratt & Whitney, OGMA is one of the most important suppliers of Maintenance, Repair and Operations (MRO) services to customers all over the world, both military and civilian.

With more than 40 years of experience in the aerostructures market, OGMA offers integrated solutions for various OEMs, such as Embraer, Dassault, Airbus Defence and Space, Lockheed Martin, Pilatus Aircraft, and

Leonardo. It currently participates in some of the aeronautical industry's most important programmes and can assemble and sub-assemble metal and composite aerostructures.

OGMA's geostrategic location is essential for its competitiveness in the global market, allowing it to work with customers in Europe, Africa, and the Middle East. In addition to its goal of continuing to win the trust of international clients in civil and defence aviation, one of the company's main ongoing projects is to build its technical and human capacity as an authorised Pratt & Whitney maintenance centre for GTF engines. 'This project involves an investment of 90 million euros, which will allow OGMA to expand its range of engine maintenance services, create new jobs over the next few years and significantly boost its turnover over the next few years,' said Nuno Coutinho. As part of this project, OGMA has invested in renovating its current industrial infrastructure and constructing new facilities comprising various technical areas, as well as a new test bench duly equipped with the latest technology to meet the current and future challenges of the aeronautical sector.

OGMA's future involves consolidating its civil and defence aircraft maintenance activity and a clear commitment to engine maintenance with the Pratt & Whitney project, which equips the new generation of Embraer and Airbus commercial aircraft. 'OGMA will continue to be on the lookout for new business opportunities in which it can add value, contribute positively to the company's performance, and positively affect the Portuguese aeronautical industry,' concludes Nuno Coutinho. All this in a sector characterised by constant innovation and major technological advances.

ogma.pt

RFA

Accessing space to better protect the Earth

German space industry leader RFA – Rocket Factory Augsburg invested in Portugal three years ago because of the talent, robust innovation ecosystem, stability, and support it found in the country. Today, the company is developing several projects in Matosinhos to develop advanced components for orbital launch systems. It wants to facilitate access to space to better protect the Earth.

RFA – Rocket Factory Augsburg, a leading German company in the space sector, opened its subsidiary in Matosinhos in 2021 and is investing in an engineering centre to develop components for micro-space launchers in Portugal. The aim was to create a state-of-the-art engineering company with advanced technology to produce components for orbital launch vehicles. Today, RFA Portugal is dedicated to the research, development, testing and production of structural components.

The company has already completed the development and production of structures for the third phase of the Redshift OTV (Orbital Transfer Vehicle) and the payload fairing for the RFA ONE launch vehicle. These projects have been developed in collaboration with CEiiA – the Engineering and Development Centre in Matosinhos. Establishing partnerships with universities and research institutions is one of RFA Portugal's objectives, emphasises the company's managing director, Carlos Valadão. 'RFA is open to establishing new partnerships with universities and research institutions in Portugal to create partnerships that promote innovation and technological development and meet the future needs of the aerospace sector.'

Some of these synergies have already been put into practice. A large part of RFA Portugal's investments is made with Portuguese suppliers, a network

that 'provides a capable response in the development of certain equipment with strict specifications', says Carlos Valadão. With the rapid growth of the space industry and the increasing demand for flexible and accessible transport services in space, other synergies are expected to be created in the future to provide innovative responses to these needs.

Stability and incentives determined the investment in Portugal

The managing director of RFA Portugal stresses that the decision to invest in Portugal was based on several favourable factors, 'including a stable political and economic environment, government incentives for investment in technology and innovation, and the availability of skilled labour. 'Portugal's geographical location is strategic for aerospace operations, for example, with possible launch facilities in Santa Maria, in the Azores.'

When Carlos Valadão was asked if the RFA had found the talent and competitive advantages it needed in Portugal, the answer was yes. The justification was the training quality and the companies' competence already in place.'Portugal has a pool of highly qualified talent, especially operational technicians and aerospace engineers. In addition, the competitive advantages, such as a robust innovation ecosystem, strong institutional support for the technology sector, the obvious and fundamental support of AICEP – Portuguese Trade & Investment Agency – and a collaborative environment with research centres of excellence, reinforced the decision to continue with the RFA subsidiary in Portugal for the industrialisation phase.'

RFA is currently working on several projects to develop advanced components for orbital launch systems, which will involve expanding facilities and increasing production capacity. 'We're going to start producing structures based on composites, which is the result of research carried out over the last three years. RFA continues to evaluate new investment opportunities to strengthen its presence in Portugal further.'

There are many challenges for the space sector. Still, the head of the RFA in Portugal emphasises the constant need for technological innovation and to meet the high costs of development and launch, in addition to international regulations and growing competition in the global launch vehicle market. And of course, the issue of sustainability cuts across different sectors, but in this case, it involves reducing the environmental impact of space activities.

'In the coming years, the space sector is expected to continue to evolve rapidly, driven by technological advances such as the reuse of rockets, the miniaturisation of satellites and the development of new materials. The commercialisation of space, including space tourism and resource exploitation, is expected to grow. In addition, international collaboration and public-private partnerships will be crucial to meeting the challenges and promoting sustainable and accessible space exploration,' concludes Carlos Valadão. The RFA, he adds, intends to contribute to this goal by offering increasingly flexible and affordable access to space and thus enabling the collection of space data that will allow us to understand better, connect and protect the Earth.

rfa.space

Spotlite

Taking care of infrastructures on Earth with images from space

Spotlite analyses soil movements or vegetation and monitors transport or energy networks to calculate risks and improve efficiency. The start-up uses data from Earth observation satellite to monitors the infrastructures essential for businesses and citizens.

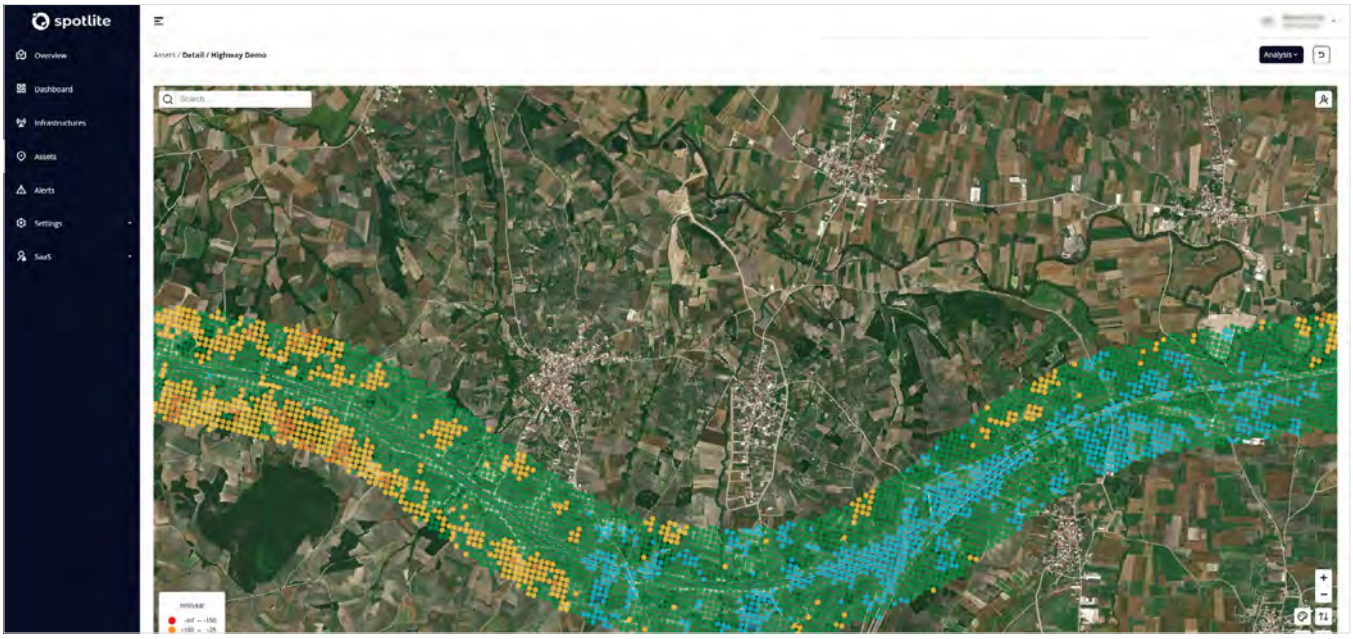
Spotlite was founded in 2017 and is based at the Pedro Nunes Institute's start-up incubator in Coimbra. It develops remote monitoring solutions using Earth observation satellite data, emphasising monitoring risks in linear networks and infrastructures.

The analyses carried out focus mainly on monitoring soil and vegetation movements. The results are made available via an online platform. The solution developed by the company has been applied to road and rail transport and energy distribution infrastructure networks. 'The tool was designed to make maintenance operations and the management of these infrastructures more efficient,' explains Martino Correia, co-founder and product director of Spotlite.

The company has developed several projects supported by the European Space Agency (ESA) through the ESA-BIC Portugal and ESA Business Applications programmes, such as applying the solution on one of Turkey's main motorways (O-5), which has one of the largest suspension bridges in the world, the Osman Gazi Bridge. This project carried out in an area with high seismic activity, had the main objective of strengthening the safety and resilience of this critical infrastructure.

Spotlite's monitoring system is already used in several countries inside and outside Europe, including Turkey, Greece, Ireland, Latvia, and Costa Rica. The solutions developed by this Coimbra-based company monitor more than 17,000 kilometres of infrastructure. The company is also investing in expanding into Latin American markets, especially Brazil. 'Latin America, with around 650,000 km of roads and almost 120,000 km of railway network, presents a wide range of opportunities for large-scale monitoring of geotechnical risks and vegetation management,' says Martino Correia.

Infrastructure monitoring is an area that is expected to see a compound annual growth rate of 14.7 per cent by the end of the decade, which means that there will be a growing demand for risk-monitoring solutions that are more efficient and affordable than traditional ones. This is the case with emerging monitoring tools based on satellite data, which offer a more appropriate response.



Several factors make these solutions attractive. Primarily, many critical infrastructures are ageing and require better maintenance strategies. In addition, the length of roads is also expected to increase in the coming years – more than 25 million kilometres of new roads are planned to be built globally by 2050. On-site monitoring also entails high costs without often allowing a complete assessment of the entire infrastructure, and some areas are inaccessible. Finally, increasingly severe and extreme weather events in the context of climate change increase the pressure on infrastructure.

Spotlite uses a combination of Earth observation data to monitor these risks, particularly optical and radar images obtained from orbiting satellites. Using Interferometric Synthetic Aperture Radar (InSAR), it is possible to measure millimetre movements of the Earth's surface remotely and continuously, allowing analysis of the structural stability of infrastructure and its surroundings. Optical data in the visible and infrared spectrum is processed to assess the growth and evolution of vegetation vitality.

The company has participated in several international accelerator programmes, namely Copernicus Accelerator 2021, EU-India Innocenter 2023, Cassini Business Accelerator 2023 or ENRICH in LAC 2023, and has taken part in two investment rounds in which it obtained a total investment of 1.7 million, with the participation of four venture capital funds.

The list of awards received is also vast: Copernicus Masters 2019 - BMVI Digital Transport Challenge; Innospace Masters 2020 - DB Netz AG Challenge Top 3; national winner of the Tech Rocketship Awards 2022; winner of the 7th ALTICE IoT Challenge; and Seal of Excellence awarded by the European Commission in 2023. This is a recognition of the work of those who analyse data from space to take care of infrastructure on Earth.

spotlitedata.com

Tekever

Drones to detect threats to human life and the environment

Tekever started out developing software to connect different devices. It became successful in manufacturing drones and recently expanded into the space sector. It quickly flew to the UK and, in 2023, opened a space platform in Toulouse, France, the capital of the European space industry. Its drones help monitor critical infrastructure or combat piracy and human trafficking.

When founded in 2001, Tekever aimed to develop software that could network many different devices. The CEO, Ricardo Mendes, and the company's co-founders believed that one day, everything would be connected and that using artificial intelligence (AI) to process, learn and define actions from a large data set would be transformative.

In 2009, Tekever began to focus on Unmanned Aerial Vehicle (UAS) systems, also known as drones. At the time, defence companies focused on hardware dominated the sector, but Tekever recognised the potential of improving these systems with software and AI and began building the devices.

Today, the company develops and operates drones that monitor hard-to-reach areas and use AI to detect threats to human life and the environment, enabling customers to take quick and effective action. In recent years, it has expanded into the space sector, developing technologies for space exploration and Earth observation.

Tekever's story began in Portugal but soon crossed borders. In 2013, it built its first international base in Southampton, UK, and recently opened its second unit at West Wales Airport in Aberporth. The UK team has also been growing, and Tekever plans to create 200 new jobs there over the next three years. Last year, the com-

pany expanded into France, opening a space platform in Toulouse, the capital of the European space industry.

From war scenarios to infrastructure monitoring

Tekever currently has clients worldwide, in Europe, North America and Africa. It has also been supporting the war effort in Ukraine since 2022, supplying unmanned aerial systems operated on the ground by Ukrainian forces. Tekever's AR3 and AR5 systems have been used in vital long-range reconnaissance and surveillance missions. A critical factor in the success of its systems in Ukraine is the agility and ability to adapt the systems to the needs on the ground.

In addition to its mission in Ukraine, Tekever continues to work with governments, military and civilian agencies, and private companies around the world, providing critical technology to address major economic, environmental, and security challenges. In North America, for example, Tekever's drones monitor and assess critical oil and gas infrastructure, while AR3s monitor the waters off the coast in North Africa to detect piracy.

In addition, the company is involved in three innovative space missions with the European Space Agency (ESA). In particular, Tekever's ISL (Inter-Satellite Link) technology was used in ESA's first planetary defence mission, Hera, which will help determine whether we will one day be able to deflect asteroids heading towards Earth. Tekever's ISL technology successfully demonstrated resistance to the satellite's electromagnetic environment.

In April 2024, the company presented the ARX, its first drone capable of coordinating a 'swarm' of smaller drones from a larger drone. The ARX, which is due to make its commercial debut in 2025, will significantly improve its surveillance and life-saving capabilities. It will combine long-range, long-duration missions with the ability to observe points of interest at short distances and from various angles. The technology will be transformative, particularly in the defence sector.

Tekever raised 20 million euros in a funding round led by Ventura Capital in January 2022 and has since accelerated its global expansion. In 2023, its revenues are expected to double again this year. Tekever's international team currently has more than 500 people, a number that is expected to rise to more than 700 by the end of 2024. ●

tekever.com

Thales Edisoft Portugal

Solutions for aeronautics, defence and space

Thales Edisoft Portugal is a pillar of excellence within the Thales Group, synonymous with innovation and experience in aeronautics, space, and defence. Since its creation, it has become a key player in these sectors.

Founded in 1988 as a partnership between Thales, a global technology leader, and the Portuguese government, Thales Edisoft Portugal provides advanced defence and naval technology solutions. Since then, it has expanded its portfolio into other domains and has become a leader in technological development in air traffic management systems, command and control, cybersecurity, and dedicated software for real-time space systems. Currently, the company's shareholders include Thales, which holds 65 per cent of the shares, NAV Portugal, and IdD Portugal Defence, each with 17.5 per cent.

Defence remains a pillar of Thales Edisoft's operations. Its employees are involved in designing, developing, and implementing naval command and control systems and excel at creating solutions that guarantee operational readiness.

Thales Edisoft is dedicated to developing air traffic management software and aeronautical communication systems in aeronautics. More than 60 international hubs rely on the systems developed by Thales Edisoft to optimise flight paths, thus contributing to the safety and efficiency of operations and reducing fuel consumption and the environmental impact of air travel.

Thales Edisoft has already supplied Real-Time Operating Systems (RTOS) for more than 50 space missions. Its contribution to the development of satellite technology is notable, having led the AEROS-MH1 project, Portugal's second satellite. It is also responsible for operating and managing the Santa Maria Teleport in the Azores, a valuable infrastructure for providing ground segment services for space missions. Its clients also include the main European agencies for detecting oil spills and monitoring meteorological data.

Thales Edisoft's Competence Centres are an integral part of the Group's strategy. They seek out local talent

to drive innovation and development and are recognised for their excellence in air traffic management systems and Naval command and control.

The national Engineering Competence Centres have played a crucial role in the company's achievements and developing projects with recognised impact.

Thales Edisoft foresees continued growth focused on cybersecurity, defence and aerospace in the coming years. Its experience in naval defence systems and air traffic solutions aligns with current and future needs, both nationally and internationally. In space, Thales Edisoft is prepared to lead the development of satellite technologies and next-generation ground systems.

The company is also committed to protecting the planet and reducing the environmental impact and risks arising from its activities and products. With a rich history and a portfolio of impactful projects, Thales Edisoft Portugal has consolidated its position as a leader in several technological industries. It aims to be a global benchmark for national excellence and innovation.

thalesgroup.com

Thales Edisoft's main projects

TOPSKY Tower

From managing aircraft movements on runways to monitoring approaches and takeoffs, TOPSKY Tower increases efficiency and the perception of control tower operators. It is a cutting-edge solution for air traffic management in ahubs such as Shanghai, Thailand, and Abu Dhabi.

TOPSKY – AMHS

Is an essential contribution from Thales Edisoft to the aviation sector. It guarantees a secure and efficient exchange of messages between different aviation organisations, significantly improving communication at decisive moments.

TACTICOS

A command and control system designed to increase the effectiveness of naval operations. It integrates and processes information from various sensors, platforms and systems, providing commanders with a comprehensive, real-time picture of the tactical environment. Thales Edisoft is committed to deploying TACTICOS throughout Europe, including Germany, Poland, the United Kingdom and the Netherlands.

C4SEA

C4SEA is part of Thales Edisoft's catalogue of solutions for naval operations. It is an integral part of maritime command and control systems, enabling a comprehensive operational picture of situations in dynamic and challenging naval contexts.

OCEANEYE

OceanEye is an innovative maritime surveillance solution. It combines satellite imagery, artificial intelligence, and data analytics to provide real-time monitoring and comprehensive intelligence on maritime activities. OceanEye enables enhanced maritime domain awareness, security, and safety in areas such as naval operations, border control, and environmental monitoring.

AICEP
Portugal Trade & Invest

An overseas network at your service

portugalglobal.pt