





## TECHNOLOGY AT HEART



## Competitive high-tech manufacturing

#### **TECHNOLOGY IN ACTION**

We showcase how three Lithuanian engineering and technology companies are deploying AI, automation and robotics to compete, thrive and innovate, right here in the EU.





#### TECHNOLOGY MEETS POLICY

Orgalim member LINPRA shares insights into what it takes to create the compelling, competitive high-tech manufacturing location that Lithuania is increasingly becoming.









#### **FOREWORD**



rtificial intelligence, automation and robotics are among the most important manufacturing technologies enabling the transformation of European industries to be more sustainable, competitive and resilient. Not only do they help increase efficiency, productivity and quality, they are also key to decarbonising, reducing waste and using resources more efficiently.

These technologies can also help create futurefacing jobs, by improving the ability of European manufacturing companies to compete and thrive in the global marketplace, as recent research indicates<sup>1</sup>.

Advanced manufacturing technologies enable the transformation of European industries to be more sustainable, competitive and resilient.

This edition of Technology at Heart features case studies from three Lithuanian manufacturing companies that have found this to be so. It delves into how they have deployed automation, robotics and AI across different industrial sectors, to meet the needs of European customers for competitive and agile, high-quality parts, products and services made in Europe. It also takes a wider look at the thriving engineering and high-tech manufacturing ecosystem that Lithuania is rapidly developing, and how it is forging a role for itself in contributing to Europe's industrial transformation.

Tangible, practical European success stories like these are particularly valuable at a time when Europe's manufacturing industries – the backbone of the EU economy – are facing a daunting set of challenges, from supply chain disruptions to soaring raw material and energy costs to geopolitical uncertainty and market decoupling.



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As Europe looks to its future – and to industry to drive its green and digital transformation and its economic resilience – supporting rapid uptake of these enabling technologies is more pressing than ever.

This report plays its part in contributing to this end. It is produced by Orgalim in collaboration with our member in Lithuania, LINPRA, and I am delighted to share it with you.

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Malte Lohan,
Director General, Orgalim



#### Malte Lohan

Malte Lohan is the Director General of Orgalim, Europe's Technology Industries, speaking for innovative companies spanning the mechanical engineering, electrical engineering, electronics and ICT, and metal technology branches. He is responsible for setting Orgalim's strategy, acting as the senior representative of the European technology industries in Brussels and managing the operations of the association.

<sup>&</sup>lt;sup>1</sup>The labour market impact of robotisation in Europe



#### **TECHNOLOGY IN ACTION**



#### Introduction

n the east of Lithuania, near the Latvian border, stands the Stelmužė Oak, one of the oldest oak trees in Europe. Believed to be at least 1,500 years old, this sturdy oak has survived the Teutonic Knights, Napoleon's army, and several periods of occupation. Along with the Lithuanian language, one of the oldest Indo-European languages still existing, it is a powerful symbol of the country's deep roots and resilience across centuries of turbulent history. A past that this small Baltic state is proud of, but definitely not stuck in.

Since its entry in the European Union in 2004, Lithuania's economy has transformed. Foreign direct investment has increased more than six times and GDP per capita has more than tripled, as the country has been steadily making a name for itself in a range of industry sectors and technologies from photonics to fintech, cybersecurity to satellites. Two unicorns – Vinted and NordVPN – and an 11th place in the 2020 World Bank ranking for ease of doing business are indicative of just how far the country's economy has come.

Beyond the headlines, in reality, Lithuania is quietly emerging as a compelling high-tech manufacturing location for European companies looking to digitalise, decarbonise and ensure strategic resilience throughout their value chains. From automating high volume production to customengineered, small batch products, the country's combination of dynamic tech ecosystem, strong engineering skills and can-do work culture is making it a leader both in developing and implementing advanced manufacturing technologies for furniture making, telecoms, renewable energy, e-mobility and more.

In the case studies that follow, we show how robotics, industrial AI, Internet of Things, and other technologies work in practice to improve productivity, reduce environmental impact and increase competitiveness. And how the three Lithuanian tech companies applying them, have done so without redundancies — eliminating repetitive tasks, addressing skills shortages and enabling more innovation and growth in the process.





## TECHNOLOGY IN ACTION S ROBOTICS





## Cutting down on wastage through AI-enhanced quality control



#### Challenge

Usually, when a production process is automated, people still perform product quality control at the end of the line. This means that a faulty part can run through several processes, wasting materials, energy and time, only to get rejected at the very end when the fault is spotted.

Say it's furniture board running at around 30 parts per minute. Typically, operators will check when the full pallet comes out and, if the top parts have any visual defects, they have to stop the line, go through the whole pallet, and possibly scrap most of the parts. But if the defect is missed, it might go all the way to the final customer before it gets noticed, triggering a customer claim and potentially a whole batch of furniture that gets scrapped.

Automating the quality control process is the obvious answer but how to do it, especially when the surface of the parts being checked is complex and irregular, like wood, with all its textures, grain, knots and varying shades of colour?

#### Solution

Quality 4.0 is the application of advanced digital technologies to enhance traditional best practices in quality management.

Lithuanian company Elinta Robotics has developed an automated visual quality control system called SmartPeek™ that operates in customers' production lines, right after the manufacturing process where the defects can happen, explains CEO Aurelijus Beleckis. The NOK, or 'not okay', parts are rejected immediately, which saves a lot of materials, energy, workforce and money, he says.



The NOK parts are rejected immediately, which saves a lot of materials,



energy, workforce and money.

Aurelijus Beleckis, CEO, Elinta Robotics



Cameras monitor both faces and all edges of the board

At its simplest, automated visual quality control can be mathematical: a plain, light-coloured part should have a dark drill hole of a specific dimension at precise coordinates, and if it doesn't, because maybe the drill bit broke, it is easily detected.

In more complex scenarios, such as when the part is wood, with all its textures, it is almost impossible to define all the possible defects. So Elinta Robotics uses AI algorithms to 'teach' the system what is a good product and what is a defect. Over time, the system can identify defects which have never been seen before.

Automating the quality control process also means that packaging can be automated, as you don't have to have a break in the production line for someone to inspect the parts before packaging can begin.

And what about the workers who were doing the quality control manually before? Usually, in Elinta Robotics' experience, customers retrain their personnel to use the new system so that, instead of manually and repetitively checking parts, they are checking data on a screen, and often able to maintain a few lines at a time. Often the savings in materials and time enables manufacturers to expand capacity. "None of our

clients has ever fired anyone because of robotics," insists Mr Beleckis.

#### **Policy implications**

What does Elinta Robotics see as the main barriers facing its business and what policies would help?

The company has invested heavily over several years in its quality control and robotics technologies, and Mr Beleckis acknowledges that more funding would certainly have helped.

But he sees the skills shortage as the biggest problem looming for businesses like his. "We should be investing much more in Europe in education and engineering and science because otherwise, in a decade or two, Asia will take over and we will be working for them," he warns.

#### **Related Orgalim position papers**

- Data Act
- Al Act
- Cyber Resilience Act
- Advanced Manufacturing
- Machinery Products Regulation

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#### **About Elinta Robotics**

Elinta Robotics belongs to the Elinta company group. The Elinta group was founded in 1991, focusing on designing high-tech, disruptive electronics and automated control systems technology created by its team of engineers.

Its core technologies range from production of automation systems, electronic components and cuttingedge image processing tools to electric mobility. Later Elinta started growing start-ups such as Rubbee, Elinta Motors, and Elinta Charge. Elinta Robotics started as Elinta's engineering department, which grew very rapidly and in 2019 became a separate company. Elinta's name encodes two words - electronics and intelligence. Elinta Robotics specialises in automation and robotics. The company is headquartered in Kaunas Free Economic Zone, Lithuania.

elintarobotics.com



## TECHNOLOGY IN ACTION CTELTONIKA





## Succeeding at electronics manufacturing in **Europe**



#### Challenge

As the green and digital economy takes off in Europe, demand is surging for electronics for renewable energy, for decarbonising industry, for the automotive sector, for medical devices, and many other applications. Electric cars, for example, have five times more electronics than conventional internal combustion engine cars. Renewable energy requires electronics for power management, inverters and more. The development of 5G connectivity technologies is also increasing the demand for electronic manufacturing services (EMS).

Where is all this electronic tech coming from? Lately, not so much from Europe: while Europe used to have a bigger market share of producing electronics and printed circuit boards (PCBs), today it represents less around 3% of a market that is dominated by China<sup>2</sup>. How can European electronics manufacturing companies compete and thrive to meet the growing demand?

#### Solution

"We have a term in the organisation—problem ability. It is both a problem and an opportunity at the same

time," says Simas Rutkauskas, CEO of Teltonika EMS in Lithuania.

For EMS companies in Europe to compete, the main challenge, apart from the supply of raw materials, is speed and flexibility. Time-to-market is a critical indicator for customers, so to compete globally it is important for most European EMS manufacturers to be fast.

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problem and an opportunity at the same time.

Simas Rutkauskas, CEO, Teltonika EMS

<sup>&</sup>lt;sup>2</sup>Global Printed Circuit Boards Market to Be Worth \$69.5 Billion by 2024



Robotic assembly ensures high accuracy and efficiency

Herein also lies the opportunity. Manufacturing closer to home reduces transportation time. It also responds to the tendency of European companies to relocate production closer to home for geopolitical reasons, for convenience and for ease of communications.

Teltonika EMS is not only tapping into that trend simply by being located in the EU, it is strategically building its competitive advantage by becoming a one-stop shop, so that customers can get the full range of services in one place. This makes communication and project development easier, quicker and more flexible, and meets the needs of European electronic manufacturers. For start-ups that want to develop new products but do not have the necessary competencies and equipment, the company's ability to offer its knowledge and competencies adds to the appeal.

Meanwhile the higher cost of labour in Europe is becoming less relevant, thanks to automation technologies. Teltonika has been steadily investing in Al-assisted automation to increase productivity – "the only way we could remain competitive and pay good salaries to our employees," as Mr Rutkauskas explains.

Teltonika installed its first surface mount technology (SMT) line in 2006 and its first advanced robots in 2017, prioritising the most labour-intensive and repetitive processes. Today there are two automated lines for the assembly of vehicle monitoring systems, with a third one planned. The company has also automated universal processes that can be applied to all its products, for example using a product packaging robot.

As for the impact on employees, Mr Rutkauskas points out that people are often still afraid that the introduction of automated systems will lead to

redundancies. However, the company's workforce now stands at 600, up from 200 people when automated systems were first introduced. "Automated systems create new jobs and encourage those who need it to requalify. We believe that the bigger risk is not to introduce robotic systems as all jobs could be lost."

Robotics have also helped to reduce energy costs per product, as well as CO2 emissions in production. The company reports it averaged 74.6 g CO2e/unit in 2021, down from 162.7 g CO2e/unit in 2020. The 2022 target is to stay within 20 g CO2e per unit produced.

#### **Policy implications**

When it comes to legislation, "as a manufacturing company, we want stability so that we can focus our organisational energy on creating value rather than adapting to new rules and regulations," says Mr Rutkauskas.

A level playing field is another obvious priority. Currently, Mr Rutkauskas points out, you can bring in circuit boards manufactured outside the EU without customs tax and manufacture electronic devices. But if you want to buy the raw materials to make the boards yourself, you have to pay customs duties on imported raw materials. This is one of the reasons why it is not profitable to produce PCBs in Europe. "We would recommend that Eurzope review those customs duties that hinder the development of the engineering industry and strengthen the global competitiveness of its manufacturers. This is just one example, and how many more are there?"

#### **Related Orgalim position papers**

- Data Act
- Al Act
- Cyber Resilience Act
- EU Chips Act
- Advanced Manufacturing
- New Legislative Framework

#### **About Teltonika EMS**



Teltonika EMS is part of the Teltonika IoT Group, that unites more than 2400 employees in 20 countries and 31 offices. Based in Vilnius, Lithuania, the company manufactures IoT devices, telematics and telecommunications electronics

products, for transport management and control equipment and industrial routers. It is also actively working to increase the share of products for the energy and healthcare sectors in its portfolio, predicting that the renewable energy sector will be the biggest growth area.

teltonika-ems.com

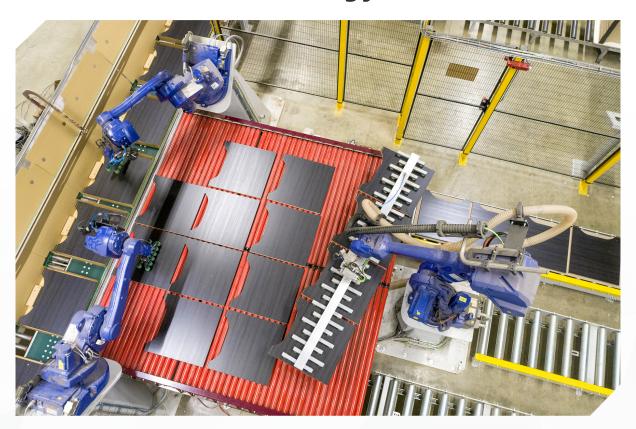


#### **TECHNOLOGY IN ACTION**





# Driving EU industry competitiveness and creating jobs



#### Challenge

How to increase EU industry competitiveness and drive innovation in the post-Covid age?

The potential of industrial automation and digitalisation to increase competitiveness and efficiency is well known and often talked about. Doing it is harder. Resistance can be due to the upfront investment costs, an under-appreciation of the benefits, and concerns about redundancies.

#### Solution

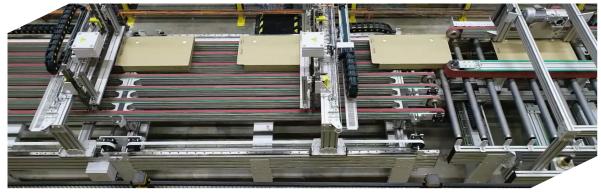
Once embarked upon, however, the benefits often exceed expectations and concerns melt away. This is certainly the experience of Lithuanian company, VMG Technics, which provides automation and robotisation products and services for manufacturing companies, especially in the wood processing industry.

Now our main practice is to help out in solving the issue of staff shortages.



#### Mantas Leknius, Director, VMG Technics

The company reports it has developed 160 Al and robotics-assisted innovations in two years, allowing companies to save hundreds, even thousands, of working hours per month. At the same time, it has been awarded for creating jobs, and is nearing completion on a massive new R&D park, focused on developing industrial automation and robotics solutions.



Packaging is typically the most labour-intensive stage of production

As Mantas Leknius, Director VMG Technics, explains, automating processes often results in higher capacities and lower remuneration costs. However, it also creates new challenges in other processes, like warehousing, management of installations, and quality inspection, for which the existing employees can be retrained. If a company is expanding and continuously investing in innovations, there are generally no redundancies.

Besides, he says, there is such a shortage of labour at the moment, that "our main practice is to help out in solving the issue of staff shortages."

Production packaging is typically the most labourintensive stage of production, as well as being the last piece in fully automating the entire production line. One of VMG's clients has 160 employees working in four shifts 24/7 just on packaging of wood furniture parts. The work is monotonous and physically demanding, leading to high turnover in these positions and this, consequently, has a strong impact on production and production capacity.

Automating this process not only frees up employees to retrain for other roles, it means the whole plant can be optimised. Four lines are being combined into one system, with artificial intelligence algorithms helping to determine the optimal paths for each product, ensuring maximum production capacity and rapid product changeovers, as well as quality control.

"Production foremen are informed on the quantities of the ordered products that can be made from the components already in stock thus helping them to decide on the optimum production line," explains Mr Leknius.

#### **Policy implications**

Automation and industrial AI has tremendous potential to drive competitiveness and innovation. But the technologies involved and the implications for employees are often not fully understood up front and that can create resistance. "The opportunities are great, but we need to realise that these opportunities are created by the people themselves," stresses Mantas Leknius. Businesses often need help, not just with the costs, but with preparing the ground and developing the knowledge and competence of their employees.

#### **Related Orgalim position papers**

- **Data Act**
- Al Act
- **Cyber Resilience Act**
- **Advanced Manufacturing**
- **Construction Products Regulation**

#### About VMG Technics

VMGTechnics is part of the VMG Group of companies mainly engaged in wood processing and wood products, including engineered wood for construction, furniture and related technologies. Based in Klaipēda, Lithuania, the group

employs around 3,000 people and exports to more than 40 countries worldwide. VMG Technics provides production, engineering services, and automation and robotisation of technological processes for companies in the VMG Group and outside.

vmg.eu



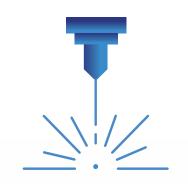


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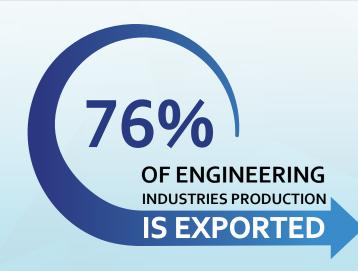


MORE THAN 50% OF THE GLOBAL MARKET FOR

ULTRASHORT SCIENTIFIC LASERS

IN LITHUANIA REPORTED 2021 TURNOVER AT

€5.4
BILLION





## TECHNOLOGY MEETS POLICY \$\inpra





## **Building a thriving ecosystem**

he case studies in the previous section show how Lithuanian engineering companies are leading the way in providing and implementing advanced manufacturing solutions in a variety of industrial sectors.

In this section, we delve into what makes Lithuania such a fertile environment for competitive, hightech manufacturing, in conversation with Tomas Prūsas, President of the Lithuanian engineering and technology industries association, LINPRA, a member of Orgalim. We explore the factors behind the success of the Lithuanian technology industries ecosystem to date, where it is headed, and what policies are key for it to thrive and keep contributing to Europe's industrial transformation.

How would you characterise the technology industries ecosystem in Lithuania and its



Lithuanian tech companies excel in designing and making things more efficiently and effectively, right here in Europe.

Tomas Prūsas, President, LINPRA

#### development over the past 10 years?

Tomas Prūsas: The growth of the engineering and technology industries in Lithuania in recent years is impressive: turnover has doubled in a little more than a decade, to around 5.4 billion euros. At the same time, if you look at the numbers working in the industry, it hasn't grown much at all. This means that the same people are creating twice as much value. It reflects significant investment, both in skills and competencies, and in more efficient technologies. Most of what is generated is exported (76%), which is a very good sign as it means that other countries value our competencies and are willing to pay for them.

What are the particular strengths that

#### make Lithuanian engineering and tech so attractive?

Tomas Prūsas: First, it is that we have skilled, competent and, most of all, motivated people. We have a lot of people that want to work - to solve, design and produce complex things that require strong cooperation as well as engineering skills. I would say motivation is our number one strength.

Skills and competencies are of course critical also, and our schools are quite good in STEM subjects, which is important. As an industry association, LINPRA is very much engaged in maintaining and developing that strength.

Besides that, I would argue that Lithuanian machinery and equipment tends to be relatively new, as our industries developed more recently, so we are not saddled with outdated legacy equipment.

All of this together makes us particularly strong in bespoke, engineering to order, and make to order, and that is where Lithuania is at right now. Our companies do design, engineering and production of all sorts of complex systems for some of the biggest brands in Europe and the world.

#### What are the most promising opportunities for these Lithuanian industries over the next 5-10 years?

Tomas Prūsas: As the case studies in this report demonstrate, Lithuanian tech companies excel in designing and making things more efficiently and effectively, right here in Europe. We can develop and deploy advanced manufacturing technologies both for small batch, bespoke manufacturing like in electronics, and also for automating high volume production, such as in the furniture making industry.

The pandemic, geopolitical uncertainty, and the need to decarbonise have all combined to put a premium on manufacturing closer to home, so these capabilities are in demand today more than ever. Indeed, most Lithuanian engineering companies are systems integrators, manufacturing for some of the biggest European and global brands. So they are very well integrated into European and global supply chains.

Looking ahead, we also see a big opportunity for Lithuanian technology companies to begin to build and push their own brands. We have some good examples of companies already doing that - Novameta, which makes stainless steel professional kitchen equipment, to name but one.

#### How would you describe LINPRA's role?

Tomas Prūsas: At LINPRA, our role is to help these companies thrive and develop. We do this



The devil is in the details and so our focus is to help make sure those details are reasonable and workable.

#### Tomas Prūsas, President, LINPRA

by working to improve the engineering industry business environment in Lithuania, by encouraging R&D synergies between companies and scientific institutions, by encouraging export development, and by promoting engineering and technology higher education and STEM subjects in schools.

This last - promoting engineering training and qualifications – is a particular focus currently, and one very close to my own heart. Because, while we have great, skilled engineers in Lithuania, we see that recruitment is a growing problem, not just here but everywhere.

Our organisation has been working on this for a while and we are preparing to launch an exciting initiative which aims to show kids and high school students that engineering is cool and has great prospects as a career.

#### On which issues do you work most closely with Orgalim? What is the added value of this EU-level collaboration for you?

**Tomas Prūsas:** We clearly understand the impact of EU level decisions on our economic environment, and on the competitiveness of Europe towards the USA, towards China, and towards the rest of the world. So our main focus is to contribute and partner to bring our experience and common sense to European legislation.

Legislation needs to be up to date and meet the expectations of society and we clearly support the movement to green and sustainable businesses and economy. But the devil is in the details and so our focus is to help make sure those details are reasonable and workable. So that it does not become so bureaucratic that it shifts our focus from creating things to spending all our time reporting, which would be the end of manufacturing progress in Europe.

That's why we are present as a national association in Orgalim and why we are very supportive of Orgalim's efforts to bring common sense to the legislation. To help that legislation evolve, closer to society, closer to business, to the people and to the engineer. And I think that's what Orgalim is really doing, creating a healthy balance between requirements and demands, between possibilities and penalties.



#### **Tomas Prūsas**

Tomas Prūsas is President of LINPRA and Presidium member of Orgalim, Europe's Technology Industries, CEO of Harju Elekter, President of Industry 4.0 development advisory board in the municipality of Panevėžys, and a Council Member of the Visaginas Technology and Business Education Training Centre. With a strong engineering background and more than 20 years of experience in engineering business development, he is actively engaged in the field of Industry 4.0 at both the national and local level. As LINPRA president, he also advocates for promoting engineering career possibilities in schools in Lithuania, through both higher education and apprenticeship schemes.

### In profile: LINPRA



#### **About LINPRA**

LINPRA is the voice of the engineering and technology industries in Lithuania, representing the interests of companies working in metal, machinery and equipment, electromechanics and electronics, plastics and rubber industry at the national and international level. At present, LINPRA unites about 130 organisations: manufacturing companies, as well as technology service providers and educational institutions.

linpra.lt

LINPRA's aim is to promote the sustainable growth and international competitiveness of the industries' companies. Fuelling and accelerating Industry 4.0, LINPRA helps businesses reshape the way they work, innovate and create. In addition to public policy advocacy, LINPRA also supports its members in training, raising employee qualifications, and promoting engineering and technology professions among young people.

With this support, Lithuania is fast becoming a top European destination for technology companies: LINPRA settles relationships between business institutions, organisations across Europe, and Lithuanian businesses, while working to strengthen exports.

LINPRA joined Orgalim in 2003. As its Director, Darius Lasionis, says: "Lithuania is relatively small as a country, nevertheless, the production output of the engineering industries sector has more than doubled in the last 15 years. Therefore, we put a strong focus on this sector and consider ourselves as part of international engineering and technologies ecosystem, right in the middle of Europe.

Being a member of Orgalim, we get operative information about the emerging legislative issues, have a possibility to express our voice and participate in the discussions with other Orgalim members. It allows us to see at least one step ahead, what the future of European engineering sector might look like and on what kind of interests of our companies we should focus.

Networking, exchanging views and experiences also open up various possibilities and cooperation in



Lithuania is relatively small as a country, nevertheless, the production output of the engineering industries sector has more than doubled in the last 15 years.

#### Darius Lasionis, Director, LINPRA

the short and long term. Recently LINPRA became the leading partner within Orgalim's Corporate Sustainability and Due Diligence working group. Activities and discussions with European partners are in process, and for Lithuanian companies it is as significant as in other countries to make sure we combine our efforts and represent the sector on the highest level – with respect to business, as well as to the environment."



#### **Darius Lasionis**

Darius Lasionis is Director of LINPRA, COO of the Baltic Automotive Components Cluster, Board member of Orgalim, Europe's Technology Industries, Chair of the Board at InTechCentras, and Board member of the Lithuanian Cluster Network association. He also participates in the activities of institutions with the aim of helping companies increase digitalisation and exports, and create mutual cooperation with foreign partners.





Orgalim's Technology at Heart series presents stories showcasing how the technology industries we represent are shaping a future that's good for Europe's economy and society – and how the right policy framework can help them do even more.

Orgalim represents Europe's technology industries, comprised of 770,000 innovative companies spanning the mechanical engineering, electrical engineering, electronics, ICT and metal technology branches. Together they represent the EU's largest manufacturing sector, generating annual turnover of over €2,000 billion, manufacturing one-third of all European exports and providing 11 million direct jobs.

We are a European-level federation that engages with EU policymakers on behalf of our membership, speaking for 29 national member associations and 20 European sector associations. Founded in 1954, and with hundreds of industry experts engaging across a broad range of policy areas, we are recognised as the foremost voice of Europe's technology industries in Brussels. Our advocacy work addresses the broad spectrum of policy and regulatory issues that impact our companies, while our Partnership services provide support to a broader network of clients in the field.

#### **ORGALIM REPRESENTS:**

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Countries

National member associations

20

European sector associations





Industries: mechanical engineering; electrical engineering, electronics and ICT; metal technology

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