

# Innovative Sector Exchange Project

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**ISE**

European Regional Development Fund

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# Developing an International Business Strategy

The Innovative Sector Exchange (ISE) is an EU-funded project providing a range of FREE support services to help SMEs explore new markets in Europe and apply innovation techniques to grow their businesses. ISE works with SMEs in Kent, East and West Flanders, Hauts-de-France and the South-West of the Netherlands on developing their internationalisation strategies. Below is a summary of the key exporting information, advice and insights the project has brought together over its lifespan.



We have combined ISE tips with elements of The Global EIS Tool – A guide to exporting, produced by the Everywhere International SMEs (EIS) project, funded by the EU's Interreg Europe programme.



View and download the full document in PDF format – [click here](#)



**The GlobalEIS tool sets out four steps to help you prepare for internationalising your business:**

## 1 Think

Your first step is to consider not just whether you're ready to export but why you want to export and whether it's the right move for you now.

Companies have different reasons for considering exporting or expanding internationally. It's not for everyone, and there's no right or wrong answer, so don't feel under any obligation. You need to decide based on the risks and benefits to your individual business. Think about:

- ◆ Your motivation to export
- ◆ The skills, resources and expertise you have within your business
- ◆ The risks to your business posed by exporting and whether you're prepared to accept them
- ◆ The approximate costs of preparing for exporting
- ◆ Whether exporting already forms part of your overall business plan – and if not, why not

If after this thinking stage you recognise that you're not yet ready to export but have the potential to do so, you need to work on addressing any gaps or weaknesses you've identified. It may be, however that you conclude exporting is not right for you – or at least not yet – and take a different direction. There are several local experts who may be able to help you make this decision including taking advantage of a 1-2-1 internationalisation and innovation assessment from the ISE Project partners.



## 2 Decide

After Thinking about it, you still believe exporting is the right thing to do. Now you need to Decide how to proceed. A well thought-out international business strategy can help focus activities and avoid surprises.

### Market Analysis

This involves gathering information about each country or region that could be a potential target market for your product or service, much of which can initially be done online. You need to collect as much accurate, reliable and up-to-date intelligence as possible about the competitive and consumer environment, legal and documentation requirements (such as export licences and intellectual property protection) distribution channels and the suitability and competitiveness of your product or service.



Check your website analytics to see the level and origin of international enquiries you're already getting: this may indicate that your product or service offer has potential in a particular country



The world is a big place and it's sensible to focus on one or two countries or areas to begin with. Consider starting in a nearby market or one which shares your language or has a similar business culture. Check your website analytics to see the level and origin of international enquiries you're already getting: this may indicate that your product or service offer has potential in a particular country.

### For help with market selection you can:

- ◆ Access support and guidance from local business support organisations.
- ◆ Identify relevant professional and trade literature.
- ◆ List useful contacts (potential partners/ customers/ others) that you may already have.
- ◆ Find out about key international exhibitions/ trade fairs.
- ◆ Find out if there is likely to be demand for what your business can offer and what might set you apart.

You can carry out more detailed market research online or by commissioning specific research activities through local international trade support services.

### Market Scanning

Once you've narrowed down your target markets, you can start to identify potential competitors (through online research, trade directories, trade show exhibitor lists etc.) Using this analysis, you can define your unique selling proposition (USP) both for your product or service, and also for your business in a market that (probably) does not yet know, recognise or understand what you do and represent. The question to ask yourself, and have an answer to, is: why would an international customer buy from me rather than a local equivalent? Then, most importantly, work out if you can still offer an attractive proposition once you've factored in any additional costs of internationalisation (see below).

### Product and service adaptations

Even within your nearest European neighbour countries, you may find business cultures are surprisingly different. Your background research in the earlier phases of your planning should help avoid any potential problems or misunderstandings. You may also identify areas where your products or services might benefit from adaptations, including packaging,

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Why would an international customer buy from me rather than a local equivalent?  
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labelling or design, to ensure it meets your international customers' needs.

- ◆ Research the cultural dynamics of your target country or region - this can avoid frustration and highlight some basic dos and don'ts
- ◆ Make an effort to learn some basic phrases in the language of your chosen market, even if it's just elementary greetings and introductions. Consider engaging a trusted interpreter to attend meetings with you or help with phone calls if necessary





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Your export plan  
is not a static  
document,  
but a flexible  
management tool  
”

### 3 Plan

Based on the insights and knowledge you've gained in the first two steps, you can draw up your export plan. The purpose is to assemble facts, constraints and goals, and set out specific objectives, time schedules and milestones.

Developing your export plan is an iterative process. The first version can be fairly simple: as you acquire more information and data about your target market, competitive position, routes to market, financial issues and so on, it will become more detailed, specific and comprehensive. It is not, therefore, a static document that once written never changes,

but a flexible management tool you can use to measure planned outcomes against actual results.

Your export plan will be entirely determined by the nature, location and size of your business, product or service, and the international market(s) you're targeting.

**There are some common elements, however, that any company seeking to export will need to consider:**

#### Technical & legal issues

Overcoming and complying with cross-border legislation (outside the EU Single Market) can seem a daunting prospect, and it's important to get it right. But you don't have to do it all by yourself!

- ◆ There is plenty of expert advice on permits, taxes, duties and documents you may need to deal with in order to export; for example, your local Chamber of Commerce or equivalent will be able to put you in touch with the right person.
- ◆ Consider using the various currency options and financial products available to help you manage risks in relation to fluctuating exchange rates, especially if you're trading outside the Eurozone.
- ◆ Contact your bank or an international trade finance specialist to make sure you can get paid.

### Internal resources and capacity

The first months of international trading can place heavy demands on your business's resources. Having set yourself the goal of securing international orders or contracts, it's important to ensure you have the capacity to deal with them when they arrive – especially if (as you presumably hope) they are large and lucrative!

- ◆ Assign a member of staff to manage international export sales and marketing; ideally, they should have previous export experience and relevant language skills.
- ◆ Identify any additional training your staff may need to deal effectively with international customers, including cultural awareness or language training.
- ◆ Make sure you have procedures and management systems in place to cover staff members who are away on international business.
- ◆ Make any necessary changes to your staffing and systems to cope with new, practical demands placed on the business. For example, you may need to extend or adjust your office hours to serve customers in different time zones.

### Additional costs of internationalisation

You need to price your product or service to take into account any additional costs that could eat into your bottom line. Consider the following



and how they will affect your international pricing:

- ◆ Insurances
- ◆ Import Duties
- ◆ Taxes
- ◆ Transport/ shipping costs
- ◆ Financial charges
- ◆ Potential exchange rate fluctuations

### Routes to market

It may seem obvious, but you need to work out how you're going to get your product or service to your customers. There are a number of different methods and tools you can consider; which one(s) you choose will depend on the nature of your product or service and where and who you're selling it to. Your possible routes to market include:

- ◆ Direct sales
- ◆ Using a distributor or an agent
- ◆ Using e-commerce platforms
- ◆ Joint ventures / partnerships
- ◆ Setting up an office, branch or manufacturing base in your target market



The first months of international trading can place heavy demands on your business – it's important to ensure you have the capacity to deal with them when they arrive



## International marketing

Your website is your window to the world and you need a strategy to ensure you're visible in your target markets. This will be an evolving strategy to reflect changes in technology, but some basic requirements include:

- ◆ Targeted international SEO and using country-specific URLs.
- ◆ Identifying the most effective social media and other channels in your market of choice, then regularly creating suitable content and responding to enquiries.
- ◆ Reviewing your communication content to ensure it is culturally relevant and appropriate. Take care with colours, imagery and language, and make sure your brand or product names won't be misunderstood or cause offence.
- ◆ Although English is the lingua franca of the online world, you should have your content professionally translated into the target language(s) where appropriate. Always take great care with online translation tools (such as Google Translate) since the results might not be 100% accurate!
- ◆ Offer clear, simple ways for potential customers to get in touch with you. Simple things like providing a foreign-language landing page and always showing international dialling codes can make a big difference.



“Always take great care with online translation tools since the results might not be 100% accurate”

## Contracts & payments

The most important thing for your business is to protect your payments and cash flow through robust contractual arrangements. You should therefore:

- ◆ Set out your payment terms and conditions clearly; seek advice and assistance from your bank or legal services provider if in doubt
- ◆ Develop your International Commercial Contracts (Incoterms) to determine the rights and responsibilities of both buyer and seller in any transaction
- ◆ Negotiate distribution and agency contracts where required, and make sure you check the conditions are being fulfilled in the international market

## Shipping & logistics

If you're exporting physical products to an international market, you need to investigate all available transport options and choose the most reliable, timely, secure and cost-effective method, based on the nature of your product, and the distance and frequency of deliveries to your customers. You should:

- ◆ Compare prices and conditions with transport companies and freight forwarders
- ◆ Ensure you know who has responsibility for your product once it leaves your premises and before it arrives with the customer
- ◆ Make sure all necessary transport documents are issued by the responsible



party and ensure that you have all necessary documentation (e.g. for VAT exemption);

- ◆ Negotiate with clients regarding the frequency of delivery and minimum order quantities to ensure your chosen shipping method is viable
- ◆ Find out whether other local businesses are shipping goods to the same destination and see if you can share delivery slots to keep costs down

### **Aftersales services and support**

Once you've made a sale, you need to consider what happens in the event of a problem, or where customer support might be needed for maintenance, troubleshooting or repairs. Questions to consider are:

- ◆ How will you deal with international customer enquiries? Will you do this directly from your office or via an agent, distributor or other 'in market' representative?
- ◆ Could you create a partner support pack, dedicated web page, market-specific helpline or other service to provide simpler, more cost-effective support?
- ◆ If applicable, what will be the procedure for returning goods and who will be in charge of that?



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## 4 Go!

After all the work you've completed in the first three steps, your business will be ready to export to your chosen market(s).

It's important to monitor the impact of your exporting activities to ensure you're achieving your planned margins and profitability. And if things are not going as you'd expected, you need to decide what additional measures are required – adjusting your product, changing your marketing, finding new partners – or whether you need to rethink some aspect of your strategy altogether.

How you measure and define these elements – what does 'good' look like? – should already form part of your export plan, which needs to be updated based on actual results and experience.



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Through the ISE Project, you have access to support and guidance for the following sectors:

◆ **Agri-food**

This includes food & drink producers, food processing, manufacturers, packaging, agricultural and bio-based companies and the supply chain.

◆ **Digital and Creative**

This includes digital technology (telecommunications) and creative activities (media, digital content, augmented reality, virtual reality & publishing).

◆ **New materials**

This involves companies which create or could use innovative new materials such as bio-based polymers, smart textiles or 3D printed materials.

◆ **Mechatronics**

This includes electronics, engineering and manufacturing companies, smart industries and intelligent systems.

◆ **Other innovation**

ISE works with SMEs from other innovative sectors including businesses which don't like to put themselves in a 'sector box'.





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Whether you're thinking about exporting, deciding to proceed, planning your export strategy or ready to go, seeking advice and support from partners can be enormously helpful  
”

### Summary

This guidance from the ISE Project is broadly applicable to any SME contemplating internationalisation. Clearly, you will also have specific concerns and considerations depending on the size and nature of your business, your product or service, sector, location, target market(s) and resources.

Whether you're Thinking about exporting, Deciding to proceed, Planning your export strategy or ready to Go, seeking advice and support from partners, both within your sector and in your target market(s) can be enormously helpful. Establishing personal contacts right along your supply chain – including distributors, partners, buyers and, wherever possible, customers or end-users - will provide valuable additional insights to inform your plans.

### Some questions to consider:

- ◆ Who do you know – or should you know – in your chosen market who can help you develop your international sales?
- ◆ What business support services aimed at international companies are available in your target market?
- ◆ Are there companies with a complementary offer you could work with for mutual benefit?
- ◆ How could you find and collaborate with 'in market' providers of marketing and promotional support?
- ◆ Are there places or events where your industry gathers, physically and virtually, where you could make links and develop contacts? The ISE Project, for example, runs a year-round programme of sector-specific events throughout its geographical region.
- ◆ Would you benefit from joining an ISE Cluster? These bring together businesses and experts within the different target sectors to meet other companies, collaborate and do business, provide peer-to-peer support, attend international business events and keep in touch electronically.



**The Clusters are free to join – click here for more details**



# The Creative Industry

The European Parliament defines the creative sector as 'those industries that are based on cultural values, cultural diversity, individual and/or collective creativity, skills and talent with the potential to generate innovation, wealth and jobs through the creation of social and economic value, in particular from intellectual property'. In practice, the sector covers a huge range of businesses and activities from digital services, product design and content creation to film-making and music.





The role of the creative sector as a driver of innovation and catalyst for economic transformation has become increasingly important in European regional policy, as underlined in the European Commission's Research and Innovation Strategies for Smart Specialisation (RIS3).

According to a 2014 report by EU, the creative industries contribute over

**€500 billion**

to the EU economy and employ over

**7 million**  
people

### New Ways of Doing Business

In traditional businesses, most of the value lies in land, buildings and equipment. In contrast, a creative business's main asset is its people and their ideas, so require different structures and ways of operating. The skills and work methods of creative entrepreneurs in fields from software design and graphic visualisation to 'gamification' and the motivation and management of project teams all have growing resonance and relevance in other parts of the economy.

### Changing the rules

It's important for SMEs working in, or collaborating with, the creative sector to recognise its more fluid, informal nature.

Much of the creative economy is based on partnerships between agencies, freelancers and other specialists who come together to work on specific projects: once it's complete, they go their separate ways. The creative sector is also much more comfortable with failure than more conventional industries: indeed, it's often essential to long-term success. Where technology and consumer behaviour are constantly changing, the development of products or services is naturally iterative; in this context, what would usually be called failure is simply 'work in progress'.

This reflects a wider move away from 20th Century ideas of mass production of standardised goods and services towards a more niche, personalised approach targeting specific users or markets. Creative businesses are way ahead of the game when it comes to developing products and services in partnership with their clients and, increasingly, with the end-user or customer too. In the age of social media, the free exchange of opinions with different

perspectives has come to be seen as more reliable than professional expertise. Allowing customers and prospects to add value to a product or service encourages businesses to see them as individuals rather than an undifferentiated mass.

### Shared ideas

Some creative businesses take this openness even further, by collaborating with potential competitors. In the UK, Wired Sussex runs a business incubator programme, Fusebox24, in which young entrepreneurs share their ideas with others and accept criticism and comment. The project has shown the value of cross-disciplinary thinking in innovation, and that a shared curiosity is more important than a common sector. A study at Harvard Business School in 2008 reported that 'the greater the distance between the problem solver's field of expertise and the problem, the more likely they were to solve it'. And as Albert Einstein observed: 'We cannot solve problems by using the same kind of thinking we used when we created them.'



## Virtual and Augmented Reality

Virtual reality (VR) and augmented reality (AR) are seen as THE big technological advance for the future, with potentially huge benefits for businesses and consumers. Goldman Sachs expects the software market to be driven by sectors ranging from videogames, live events and real estate to retail, education and engineering: it predicts the three biggest markets in 2025 will be entertainment, healthcare and engineering.

However, VR and AR are not yet the game-changers their proponents have suggested, owing to technological, interface and user issues. Some commentators have compared VR and AR today to the Internet in its early days: the



**Some Dutch companies at the forefront of VR and AR development are:**

- ◆ [www.vrmaster.co](http://www.vrmaster.co)
- ◆ [www.unit040.nl](http://www.unit040.nl) (Smart Visualisations)
- ◆ [www.nuformer.com](http://www.nuformer.com) (video and 3D projection mapping)
- ◆ [www.dutchrosemedia.com](http://www.dutchrosemedia.com) (augmented reality)

infrastructure is still too expensive, and the audience too limited to make a strong business case for developing new content - and there are no tools and platforms for users to do it themselves.

That said, there are signs that VR/AR is evolving beyond hype and moving towards serious business. In the Netherlands, the Brabant Development Agency (BOM) is convinced that within five to 10 years, the technology will be intertwined with our everyday lives just like the Internet and the smartphone are today. Its 2017 market survey revealed more active users, increased use of the technology in operations, more realistic budget expectations and a growing interest among respondents in experimenting with VR/AR.

### Real-world financing

Financing is a potential barrier to the industry's development. Almost 80% of VR/AR developers in the BOM survey who had already attracted funding will require further investment: half said their future needs exceeded €1 million. The problem is that, as Facebook's Mark Zuckerberg noted in 2017, VR/AR is 'not going to be really profitable for quite a while'. Based on its experience as an investor, BOM believes developers should

outline realistic strategies to build a significant market position or become a leader in a specific market segment in order to attract backers.

### In at the start

The BOM survey shows that, as well as funding, developers and users see 'unfamiliarity with the possibilities' and an 'insufficient business case' as important obstacles to adoption. The technology is still held back by what the Canadian media theorist Marshall McLuhan called the 'horseless carriage syndrome': human beings insist on looking at the new world as though it was the same as the old. This presents opportunities to first movers. Since they already experiment with new technologies, they can more quickly understand the potential for new products and services, giving them an edge in the market.



**To view the BOM report in PDF format, click here**



3D printing is being used to visualise ideas and examine the look and feel of future products



### 3D Printing

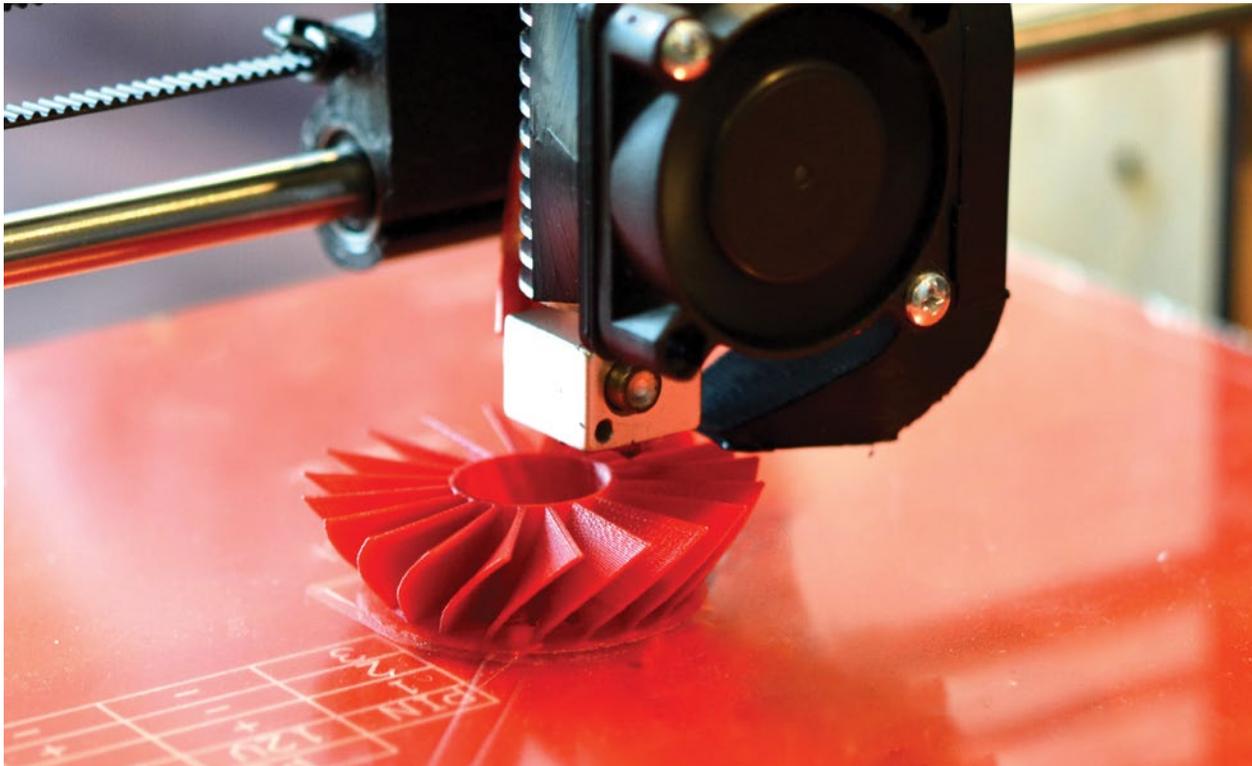
As well as the more obviously 'artistic' segments like digital design, video and film-making, fashion and music, the creative sector includes companies that make physical products. A key innovation for these companies has been the advent of 3D printing. Compared to technologies like VR and AR, 3D printing is well-established, with a track record going back

more than a decade. Yet even this relatively mature technology is still evolving rapidly, with new applications constantly emerging and set to continue doing so for the foreseeable future.

In the creative sector, 3D printing is being used to visualise ideas and examine the look and feel of future products. In conjunction with computer-aided design (CAD) 3D scanners or digital photography, it can create highly complex shapes, giving designers new levels of creative freedom and scope for product personalisation. The accuracy of 3D printing enhances the functionality of printed parts and also minimises wastage for improved environmental sustainability.

#### New production models

3D printing frees creative companies from the constraints of conventional materials, methods and equipment requirements, giving them the flexibility to explore new models of production. For example, 3D printing offers fantastic opportunities for small companies to shift production from large overseas plants to smaller, more local facilities - or even stop outsourcing altogether and move production back in-house. As well as bringing small companies closer to their local market, this allows them to produce short runs and individual items, in line with the move towards greater personalisation and customer involvement in product design.



## Success Factors for International Digitalisation

The creative sector is built on technology and people's skills and imagination. Companies do not require large-scale capital equipment or premises and can achieve economies of scale through connectivity and collaboration. Consequently, the sector is dominated by SMEs, micro-businesses and sole operators, who may not feel that internationalisation – effectively becoming exporters – is a practical option.



Based on experience from Sweden, the ISE project has identified five key success factors for companies looking to expand internationally through digital channels.

### 1 Do your digital homework

Conduct a full audit and inventory of your organisation's existing digital resources across all departments and functions, and what you need to develop to succeed internationally. Then consider the digital maturity and infrastructure of your target market. As well as technology, examine the wider digital landscape: what characterises the market in terms of culture, language and consumer preferences? What triggers buying behaviour in the market? What are your digital competitors doing? What local regulations and conditions apply to sales, payment and delivery terms, and to the use and storage of personal data? The EU has recently introduced its General Data Protection Regulations (GDPR) but in some markets, digitalisation legislation has not kept up with developments in technology.

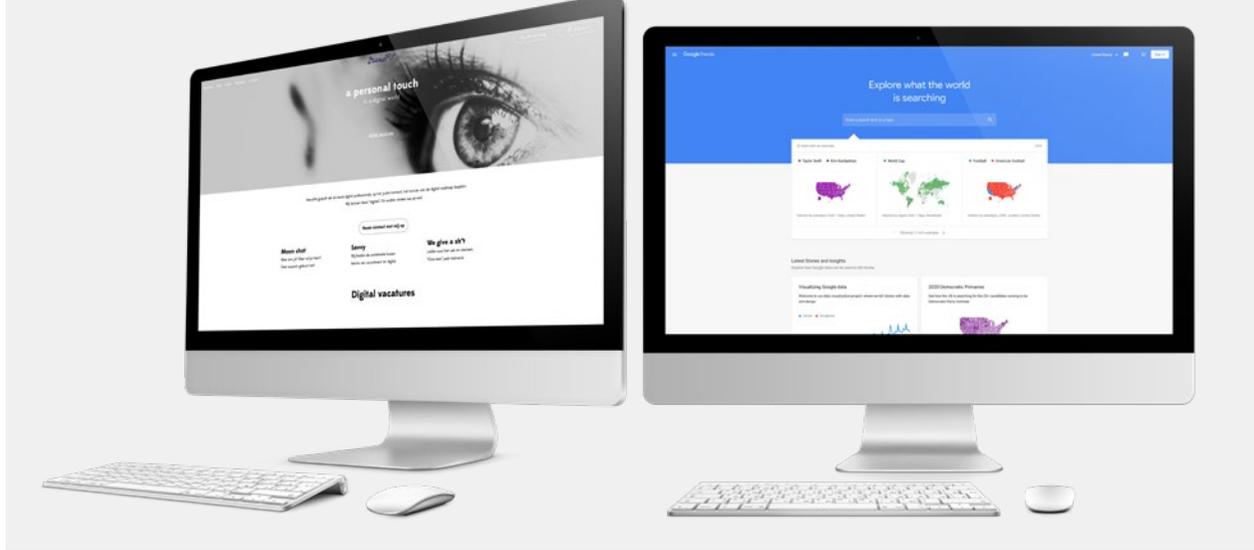
“ Digital tools can give you a global reach without having to develop completely new processes ”

## 2 Develop your international business model digitally

Challenge your existing business model and identify how digital innovation could help you reach customers and segments that were not accessible through direct sales, agents or distributors. Using digital tools can give you a global reach without having to develop completely new business processes. Important considerations for your digital international business model are:

- ◆ Decide what digital tools you need to maintain contact with clients, handle support cases and manage resellers. Small companies can be perceived as big in the digital world, and interact with clients in the same, professional way.
- ◆ Ensure that digitalisation makes your organisation more agile and responsive and doesn't simply create additional administration.
- ◆ Technology and your market do not stand still for long, so keep your digitalisation plan constantly under review and up to date.
- ◆ Assess your business on an item-by-item level and see how you could scale it up; identify and address any blockages or bottlenecks that may prevent or restrict scalability.
- ◆ Collect data and information to support your sales network, especially in markets where customers may be hidden behind a local distributor.





- ◆ Establish your current key performance indicators (KPIs) and set targets for your international operation. Keep these under review as the digitalisation process advances, both to secure that you are on track, and to motivate your organisation to keep changing.
- ◆ Involve your suppliers and customers. They will provide important input and guidance and are more likely to stay connected to you if you include them early. Creating global sales online could threaten your existing conventional sales channels and agreements, such as local sales agents or distributor contracts, so these need to be mapped and managed carefully.
- ◆ Adapt your online presence depending on market characteristics and customer preferences. Make the customer feel at

home and adapt your payment methods depending on the local payment culture. A Product Information Management (PIM) system can not only help you store product information, it can also translate it into other languages for you.

- ◆ Don't neglect fundamentals like cash flow as your online business grows.

### 3 Leverage big data

Big Data is not just for big business. There are numerous analytical tools that can give small companies important insights into your international target groups. You can also gather your own data by giving every customer interaction a unique ID that traces its path from initial enquiry to signed order via your digital systems. This means you will be able to see what kind of interaction leads to what kind of result,

and you will be able to see how sales is connected to interest and different activities. Tools such as Brand Pit will reveal how your products appear in images on social media, while Google Global Market Finder and Google Trends can give you insights into what consumers are looking for. Use dashboards to illustrate your KPIs and make it easy for people to understand and draw conclusions from data.

### 4 Apply the multi-channel approach

A multi-channel approach where digital and analogue channels interact seamlessly to create the best customer experience facilitates and strengthens relationship-building. Before entering a new channel, see how other similar companies are using it, and learn how the channel owner may monetise your content: remember, there's no such thing as a free lunch.

Also bear in mind that you never fully control what happens to your content, so you need to develop a strong story and actively track and shape what is being said. Build a community that supports you and be prepared for negative comments on social media.

### 5 Strive for digital symbiosis

Digital should not be separate from your ordinary operations, but seamlessly integrated with them, so they become greater than the sum of their parts.

## Next Steps for Creative Businesses

For SMEs in the creative sector, technology can bring you more clients, shorten lead times and allow you to trade and compete globally, minimising or removing the barriers of size, scale, location and finance that might otherwise have kept you out of these markets. To make it work effectively, however, all parts of the company should be involved in the journey. Technology can be disruptive and threatening, so you need to focus on the benefits rather than the risks for individual employees and teams. Where SMEs have a real advantage is in their naturally flexible, responsive structures and unconventional ways of thinking and working, including a more relaxed attitude to failure and risk.



## Some practical things to consider as a creative business:

- ◆ **Evaluate your current processes critically, objectively and honestly.** Where are you losing time and money, or not delivering the speed, quality and consistency your customers need? Are you doing things or using certain methods just because 'that's what we've always done'? How and where could new technology and/or thinking improve your efficiency and performance? And are there other things you could be doing, other markets you could be exploring, with your existing technology and capabilities?
- ◆ **Examine your own thinking and attitudes.** Are you missing out on the opportunities presented by 3D printing, Big Data or VR and AR, because you believe it's too difficult, complex, arcane or just 'not for you', or that your business is too small or otherwise 'unsuitable'? Look at what's going on with an open mind and be prepared to be inspired and excited, even if the technology itself is unfamiliar.
- ◆ **Look at what your competitors are doing.** Is digitalisation giving them a competitive advantage over you and the rest of your market? Or can you see a weakness in their operation that you could exploit by changing your own methods and approach?
- ◆ **Think wider and further than your own market.** What innovations and developments are happening in other sectors and industries that could have applications in your business? The nature of disruptors is that they make waves that spread far beyond their original starting point: can you see potential in a new technology that its creators - and your competitors - have never even thought of?



- ◆ **Think long-term.** Technology is changing constantly, and lifecycles are shortening. Working with partners in industrial and academic research will help you keep up to date with developments and decide how future-proof an innovation will be for your business.

#### How creative businesses can benefit from working together with other creative companies:

- ◆ Think about the skills gaps and needs within your organisation, and how these could be met by working with another creative company. For example, if you're producing video, could collaboration with an aerial photographer specialising in drone footage add a new dimension to your work and what you can offer your clients? The range of niche skills and capabilities out there is growing all the time.



**Creative work can - indeed, should - produce surprises and unexpected results, so be open to possibilities, and ready to change your original plan if a new, different or better option emerges from the process.**

- ◆ See other creative specialists as an extension of your own team, not just suppliers. A good partner will want to spend time getting to know you and your business. The more integrated they are, and the deeper their knowledge and understanding of your business, the quicker and more effective the creative process will be.
- ◆ Creative work is subject to the old computing maxim GIGO – Garbage In: Garbage Out – so a tight, solid, comprehensive brief is essential. Investing in preparation will save huge amounts of time, cost and heartache later on. Creativity is an iterative process, so feedback is also extremely important; but be clear, objective and focused so you can move the project forward, rather than simply saying what you don't like!
- ◆ Involve your creative partner as early in the project as possible; as natural 'ideas people' they will often have useful knowledge, experience and insights in areas outside their speciality.
- ◆ Accept and embrace the fact that all creative businesses tend to approach things in their own unique way. You may have to deal with unconventional people, processes and philosophies – and remember, a partner may find your methods equally unfamiliar!
- ◆ Let your partners' creativity and flexibility influence and inform your own operations and approach; equally, they will want to learn from you.
- ◆ Spread the word. Paradoxically, many creative people find marketing and promoting themselves quite difficult, and small companies need all their time and resources for clients' projects, so they tend to rely heavily on recommendations and referrals.





INNOVATING FOR INTERNATIONAL MARKETS



## Food & Drink Products

For food and drink producers, exporting offers great opportunities to develop new markets and products. However, other countries may have different regulations and standards to your domestic market; and customers' tastes and preferences will be different, too. Through research, customer enquiries and innovation, you can adapt your products, processes and operations to meet these challenges.



The EU Single Market streamlines, simplifies or removes many export issues, so if you're based in and exporting to other EU member states, the process should be relatively simple. For British-based companies, and EU businesses looking to build exports into the UK, there may be additional costs and regulatory barriers to overcome. The trading arrangements between the UK and EU are still evolving; the relevant organisations in your country will be able to advise you on the possible impact on food product standards in the future.

## Your Product

The first thing to focus on when considering exporting is the product itself. Even if it has great and obvious export potential, you may need to adjust aspects of it to make it suitable for international markets. Simply creating a single, separate 'export version' is not always feasible, either: you should treat each country you wish to export to as a separate market in its own right.

### Some things to consider include:

#### 1 Flavours, colours and textures

You need to ensure your product appeals to local tastes and preferences. Do some research and, if possible, test your product with consumers to see how they respond. Adjusting your recipe, or creating specific flavours, colours and textures for individual markets, can make all the difference.

#### 2 Shelf Life

By definition, an export product has to travel! A product that stays fresh for a few days or weeks is therefore unsuitable for export. Your product needs to remain at its best for at least nine months, so you may need to adapt your recipe or processing to achieve this.

#### 3 Ingredients

Your ingredients will need to comply with local regulations. For example, some countries may have their own rules about salt and sugar content, or using certain colourings, flavourings or animal products. This could involve changing your recipe, so do some testing to make sure it still works!



#### **4 Packaging**

Again, make sure your packaging is suitable for the local market. Visit retail outlets and see how your type of product is usually presented: are customers used to buying it in cartons, jars, tins, bags, and in what sizes or quantities? You also need to ensure your packaging conforms to the country's regulations for disposal, re-use or recycling. In some markets, using sustainable or recycled packaging could make your products more appealing.

#### **5 Labelling**

The information you're required to display on your labels may vary between countries, so always check the local regulations. This may include translating information about allergens, customer support and other details into the relevant language(s).

#### **6 Product Positioning**

You need to be clear about who your customers are and find appropriate outlets to reach them. Supplying restaurants and food service requires a very different approach to selling through

supermarkets or delis, for example; and bear in mind the different storage, handling and display requirements of ambient, fresh, chilled and frozen products.

#### **7 Transport and shipping**

Think about how you will physically get your product to market, particularly if it is chilled, frozen or perishable. You need to balance time, distance, cost and value, based on the nature of your product and your customers' requirements.

#### **8 Promotion**

Your product will be competing against food and drink that local customers know, recognise, understand and take great pride in. You need to give them a good reason to choose your product over the familiar domestic alternatives. As the case studies show, you may need to explain what your product is and how and when to use it. The history and the person behind the product is extremely important in the artisan food and drink world, so tell your story clearly and proudly at every opportunity.



## CASE STUDY

### Fudge Kitchen (UK)

Fudge is a traditional British confection produced from sugar and cream and, like chocolate, has many varieties & qualities. Fudge Kitchen set out to challenge the world of high-end chocolate with their range of fudges; all hand made in small batches with natural ingredients to ensure a deliciously smooth product of the highest quality.



Fudge Kitchen founder Sian Holt wanted to find new markets for her products to ensure year-round demand and grow her business, so began investigating export opportunities.

Her first challenge was the product itself. Fudge made with cream has to be consumed within five to seven days, making it unsuitable for export. The company spent a year researching and developing a new recipe using butter, which extended the product's shelf life to 12 months. As a bonus, some of the experiments produced surprising and unexpected results that led to new products in their own right.

With the basic recipe perfected, Sian then had to ensure the flavours were suited to international markets. This meant creating a number of new flavours, such as a liquorice fudge specifically for the Dutch market.

Her next hurdle was the name. The word 'fudge', while familiar to British and North American consumers, is almost unknown in mainland Europe. The company solved the problem by calling its product 'Premium British Confectionery' instead: combined with high-end packaging and branding, this created a new niche position alongside fine chocolate in the marketplace.

## CASE STUDY

### Sticky Toffee Pudding Company (USA)

In 2003, Tracy Claros moved from her native England to Austin, Texas, where she started selling chilled homemade British desserts, including sticky toffee pudding, at a farmers' market. Like Fudge Kitchen, she had to overcome a language barrier, since 'pudding' has a different meaning in America to the UK. As the business grew through word-of-mouth recommendations, Tracy approached retailers, where she encountered a second problem: most stocked only frozen desserts, not chilled. She eventually negotiated chilled space with premium chain Whole Foods Market, where her product came to the attention of O Magazine, run by Oprah Winfrey. The resulting publicity, followed by several national awards, boosted sales both in-store and online. The company now produces over a million desserts per year through a contract bakery in Chicago, and has annual revenues of \$4m (£3m). As well as major retailers including Costco and Wal-Mart, the company also supplies British Airways and Virgin Atlantic.

The company's success demonstrates the importance of having a compelling, authentic story behind an artisan food product.



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The company's success demonstrates the importance of having a compelling, authentic story behind an artisan food product

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## Your Business

As well as having a suitable product, you need to ensure your business is ready to operate internationally, too. Do your research: be realistic about your strengths and the opportunities, and honest about the challenges and barriers.

Moving into exporting involves many of the same decisions and thought processes as any other business activity. You need to balance costs and benefits, ensure you have the right resources in place, and be prepared to invest time in developing relationships and trust with your new customers.

### Initial research

The first and most obvious consideration is the size of the potential market and the state of the competition. You can do a lot of this basic research online, but there is no real substitute for visiting your target market. International trade fairs are also excellent sources of intelligence and contacts.

In most cases, you will start by targeting a small number of countries, based on the opportunities they present. As well as current buying habits, look at

trends: demand for your type of product in a particular market may be small now, but forecast to grow rapidly; equally, what appears to be a large market today may actually be in long-term decline. You also need to consider demographics: the age and spending power of a country's population will have a big effect on your product and pricing decisions.

### Commercial factors

Intellectual Property (IP) is one of your most important assets, so you

need to ensure you can protect it in different markets. EU law applies within member states: how it will affect companies trading from and to the UK is uncertain. The same applies to cross-border payments, insurance, taxation and other commercial issues.

You also need to consider your routes to market: you may choose to sell directly, through agents, distributors or third parties, online, or a combination of these, depending on your product and the market. In all cases, make sure you clearly define and communicate your unique selling proposition (USP) as part of a wider marketing strategy.

### Export practicalities

As noted above, the Single Market removes many of the regulations, and much of the paperwork, involved in exporting between EU Member States. Without the free movement of goods, exporting to and from the UK may become more complex, depending on the future trading arrangements: please consult the relevant organisations in your country for the latest advice.



You need to balance costs and benefits, ensure you have the right resources in place, and be prepared to invest time in developing relationships and trust with your new customers



Wherever you are exporting from and to (and particularly outside of the EU) you need to know which documents are required and how quickly you can obtain them: this is important because it may affect your delivery schedules.

### Managing and building your export business

Good business practice is the same wherever you are operating. You need to treat your overseas customers with the same care and attention as your domestic customers. That means maintaining regular telephone and email contact, and visiting them as often as you can. You also need to ensure goods are delivered on time, and problems are resolved quickly and effectively.

Agreeing a joint development plan with a specialist importer or distributor can help you reach further and deeper into the market. As you gain experience and knowledge, you can apply this to develop new opportunities elsewhere.



INNOVATING FOR INTERNATIONAL MARKETS



## Innovation in SMEs

Innovation means creating new things, whether that's products, processes or ways of thinking. In business, it's about coming up with sustainable solutions that give you a competitive advantage. Innovation is not change for its own sake: it should always be driven by a real, identified need. At its simplest, that could be a demand from customers for a better experience; more widely, it could be a desire to create a more attractive, efficient and equitable society.



Innovation does not just ‘happen’, and cannot be left to just one person or team; it has to be part of a company’s DNA, so that it becomes natural and instinctive for everyone, whatever their role. With their small numbers, close internal relationships and open structures, free of hierarchies and demarcation, SMEs are perfectly placed to achieve this.

## Why Innovate?

When considering a new product or approach, the first question to ask yourself is: ‘Will this benefit my customer?’ Ideally, innovation should provide both direct and indirect benefits. For example, a new type of thinner optical lens could make spectacles lighter and more comfortable to wear (direct benefit) while also opening up new design possibilities, giving customers more choice of frame style to achieve their perfect look (indirect benefit).

## The Innovation Process

While the idea behind an innovation may appear quickly and spontaneously, the innovation process itself can be quite complex, which can discourage SMEs from pursuing it. However, what SMEs may lack in skills, resources and funding, they generally make up for in flexibility, adaptability and ingenuity.

The key to any innovation project is to start with a solid plan. How the project proceeds will depend on the nature of the product or service you’re creating, but as a guide, innovation generally follows a five-stage process.

### The Five-Stage process of Innovation





## Exponential Thinking

For SMEs, innovation is not confined to products and services: it also extends to developing new methods of doing business and thinking about the world. This is important because technology means change no longer occurs in a linear way, but exponentially. Companies that have seen a technology's potential and adopted it ahead of anyone else have experienced astonishing growth: think of Uber, Google, Amazon or Airbnb. Equally, those who saw it too late, or thought it would never take off, have suffered: Kodak collapsed after failing to understand the impact digital cameras would have on its photographic film business.

The ISE Project ran a series of workshops in West Flanders to introduce the concept of exponential thinking to SMEs and help them make the most of the opportunities it presents.

### Early adopter companies that saw the potential of technology

Uber

Google

amazon

airbnb

### Those who saw it too late, or thought it would never take off

Kodak

Blockbuster

BlackBerry

Polaroid

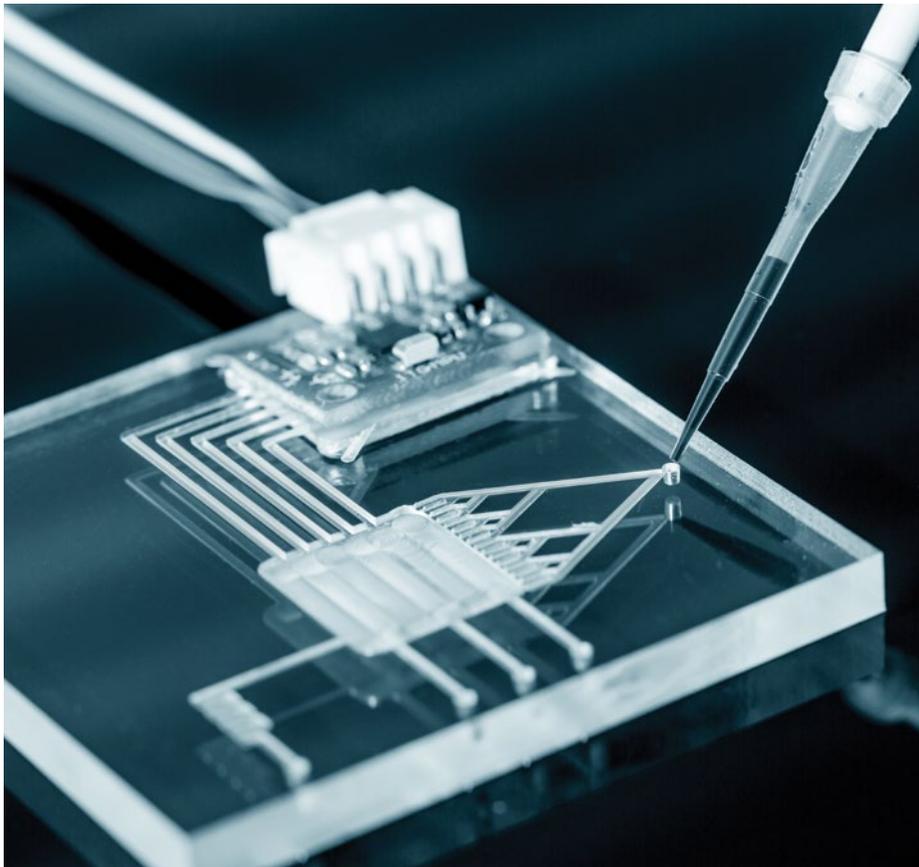
### Innovation and disruption

Exponential thinking produces disruptors - innovations that create a new market all by themselves, eventually going on to replace established market-leading products and companies. The Apple iPhone is a classic example; but you don't have to be a tech company to be a disruptor. Whatever your field or sector, disruption is a tool for change and an agent for growth. It is the art of asking better questions, challenging conventional wisdom, and overturning assumptions and prejudices that get in the way of new possibilities and ideas.

As an SME, it means challenging yourself to explore how smart technologies could make your business more efficient. In manufacturing, there is huge potential in rapid prototyping, additive manufacturing and Industry 4.0; other disruptors like blockchain and artificial intelligence are transforming how businesses interact with customers and each other. These innovations are happening now: your choice is not whether to adopt them, but when. SMEs' scale and flexibility makes it easier for them to actively embrace disruption and discomfort, and allow technological changes to have a positive impact on their business.



The ISE region is home to many innovative companies at the forefront of developing and adopting KETs – The ISE project has been extremely important in connecting these SMEs and broadening the region's base of KET skills, experience and applications



### Key Enabling Technologies (KETs)

KETs are a group of six technologies:

- 1 **Micro and nanoelectronics**
- 2 **Nanotechnology**
- 3 **Industrial biotechnology**
- 4 **Advanced materials**
- 5 **Photonics**
- 6 **Advanced manufacturing technologies**

They provide the basis for innovation in products across all industrial sectors. KETs are vital in modernising Europe's industrial base, driving the shift to a greener economy and underpinning entirely new industries.

### EU support for KETs

The European Commission recognises that companies and regions who fully exploit these KETs will be at the forefront of creating advanced and sustainable economies in the future. It now has a strategy to support the development of KETs through investment, improving access to technology platforms, and support for trade, skills and large industrial projects. It also runs the KETs Observatory, an online monitoring tool providing EU, national and regional policy makers and business stakeholders with quantitative and qualitative information on KETs deployment within the EU and other world regions.

### ISE and KETs

The ISE region is home to many innovative companies at the forefront of developing and adopting KETs. The ISE project has been extremely important in connecting these SMEs and broadening the region's base of KET skills, experience and applications.

## Blockchain

### What does blockchain do?

The best-known blockchain application is the cryptocurrency bitcoin, which was invented in 2008 to enable direct transactions between people without the need for 'trusted' third parties. Although bitcoin itself has had its problems and controversies, the underlying blockchain technology has proved highly robust.

In simple terms, a blockchain is a database, providing a global ledger of who owns what and when. Such registers usually rely on centralisation to ensure records cannot be changed by unauthorised people or means. However, this model is expensive to secure and requires trust in whoever is in charge: it also creates a single, central point of potential failure.

Blockchain eliminates these problems by using a decentralised network. This means the security cost is shared by people and companies worldwide; and instead of trusting an owner or manager, you trust a set of rules. To change a transaction without anyone noticing would require a blockchain with more computing power than the entire network combined. In the case of bitcoin, this would be practically impossible, since the network is more than 100,000 times stronger than the world's top 500 supercomputers combined!



The Bitcoin network is more than 100,000 times stronger than the world's top 500 supercomputers combined



## Everyday blockchain applications

Blockchain technology is relatively new and still evolving. However, there are already a number of ways in which SMEs can already put it to work in everyday business. These include:

APPLICATION	USES	EXAMPLE
<b>Record keeping</b>	<ul style="list-style-type: none"><li>◆ Create permanent records without relying on a trusted third party</li><li>◆ Use automation to make your record-keeping more efficient</li></ul>	Know-Your-Customer (KYC) processes
<b>Transfer of value</b>	<ul style="list-style-type: none"><li>◆ Enables low-cost, near real-time value transfer without an intermediary</li><li>◆ Transfer other assets beyond 'money'</li></ul>	Supply chain tracking
<b>Smart contracts</b>	<ul style="list-style-type: none"><li>◆ Program protocols to automatically verify conditions online and execute transfers themselves.</li></ul>	Renting, selling or sharing property (from a house or car to a bicycle...)
<b>Decentralised applications (DApps)</b>	<ul style="list-style-type: none"><li>◆ Open-source applications running on peer-to-peer (P2P) networks</li><li>◆ Includes user interface</li></ul>	Self-renting cars (La'Zooz)
<b>Decentralised Autonomous Organisations (DAO)</b>	<ul style="list-style-type: none"><li>◆ Governed by members through consensus (usually by voting)</li><li>◆ Management guided by rules written into a set of contracts executed by computer code</li></ul>	Contracting

## Blockchain beyond bitcoin

But blockchain technology has applications far beyond digital money; it can also be used to transfer and record ownership of contracts, patents and other business assets. This potential expands further with the two types of blockchain available: public blockchains, which are completely open, so anyone can participate in the network without requiring identification or authentication; and private blockchains, which are limited to specific participants, making them ideal for corporations who want to work together more efficiently.

For SMEs, blockchain technology has many advantages, including:

- ◆ It's cheaper than traditional technology, because it uses a vast, decentralised system with no need for middlemen.
- ◆ All information has a time-stamp, so tampering is extremely difficult.
- ◆ The blockchain acts as a single, shared database that's always updated, so you don't need to create and maintain your own database, saving time and money.
- ◆ Everyone on the network can see what's on the blockchain (as long as they have a secure key) so it's completely transparent, eliminating potential disputes or disagreements.

## CASE STUDY

### East Flanders

East Flanders is positioning itself as a region 'where knowledge works', based on its highly developed logistics and thriving knowledge economy. Together, these strengths create a climate where companies and educational and research institutions can co-operate to inspire and enrich one another. The province's key sectors include biotech, automotive, food, steel, life sciences, creative industries and ICT; its capital, Ghent, is a vibrant city that provides the perfect environment for start-ups.

The regional Chamber of Commerce, Voka East-Flanders, supports these start-ups and SMEs through knowledge exchange and R&D centres, organises visits to innovative companies, and invites thought-leaders and CEOs from international firms to share their experience. It has also run sector-specific events focusing on the Smart Economy, or with presentations from leading industry companies. These events have included:



**The Province of East-Flanders has produced an online brochure about the region and its rapidly-expanding knowledge economy – click here to read it**



### Food Sector

VProef! (above) is an innovative collaborative food platform, with a Research & Prototyping lab that initiates and co-creates the products of tomorrow. It is a test kitchen for new ideas and techniques, giving food start-ups the opportunity to grow faster.

### Digital Sector

Based in Merelbeke, Viu More is an innovative company that works on future trends for industrial companies and training facilities using mobile devices, augmented reality, mixed reality and mobile apps.

### Creative industries Sector

Ghent's Dok Noord former industrial site is an economic hotspot, home to digital, marketing and creative start-ups and international scale-ups such as Teamleader, Trendwolves and Story Me.



Innovative technologies like blockchain, artificial intelligence and Industry 4.0 are new, dynamic, rapidly evolving – and here to stay



### Summary

Disruptive, innovative technologies like blockchain, artificial intelligence and Industry 4.0 are new, dynamic, rapidly evolving – and definitely here to stay. For SMEs, the potential applications range from relatively simple functions such as record keeping to highly sophisticated commercial relationships like Decentralised Autonomous Organisations.

As well as being disruptive, these technologies are open and collaborative, based on shared rather than centralised ownership. This decentralised model eliminates many of the costs and formalities of traditional systems, which in turn can make them more accessible to SMEs. Blockchain, in particular, is ideal for small businesses, because it's cheap, simple, secure and transparent. No matter how big or small your company, blockchain technology could improve your business processes and networks and help address a range of challenges.

It's also important to remember that innovation is something all companies can and should be engaged with. It's as much an attitude as an activity. Innovation needs to be embedded throughout the business, at all levels and in all functions. For SMEs, it's about seeing and exploiting the potential of today's exponential technological developments, and making disruption an agent of positive change.



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Innovation takes many forms, from a simple adjustment to an existing process or technique to wholesale change across your entire business

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#### Your next move

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- ◆ **Invest time** in considering the potential for introducing or extending innovation in your business. It's important to involve people from all levels and teams, to make innovation something everyone does and contributes to, rather than a discrete function confined to a single department or role.
- ◆ **Evaluate your current processes** critically, objectively and honestly. Where are you losing time and money, or not delivering the speed, quality and consistency your customers need? Are you doing things or using certain methods just because 'that's what we've always done'? How and where could new technology and/or thinking improve your efficiency and performance?

- ◆ **Examine your own thinking** and attitudes. Are you missing out on the opportunities presented by blockchain, for example, because you believe it's too difficult, complex, arcane or just 'not for you', or that your business is too small, low-tech or otherwise 'unsuitable'? Look at what's going on with an open mind and be prepared to be inspired and excited, even if the technology itself is unfamiliar.
- ◆ **Look at what your competitors are doing.** Is innovation giving them a competitive advantage over you and the rest of your market? Or can you see a weakness in their operation that you could exploit by changing your own methods and approach?
- ◆ **Think wider** and further than your own market, too. What innovations and developments are happening in other sectors and industries that could have applications in your business? The nature of disruptors is that they make waves that spread far beyond their original starting point: can you see potential in a new technology that its creators - and your competitors - have never even thought of?
- ◆ **Think long-term.** Technology is changing constantly and lifecycles are shortening. Working with partners in industrial and academic research will keep you up to date with developments and decide how future-proof an innovation will be for your business.

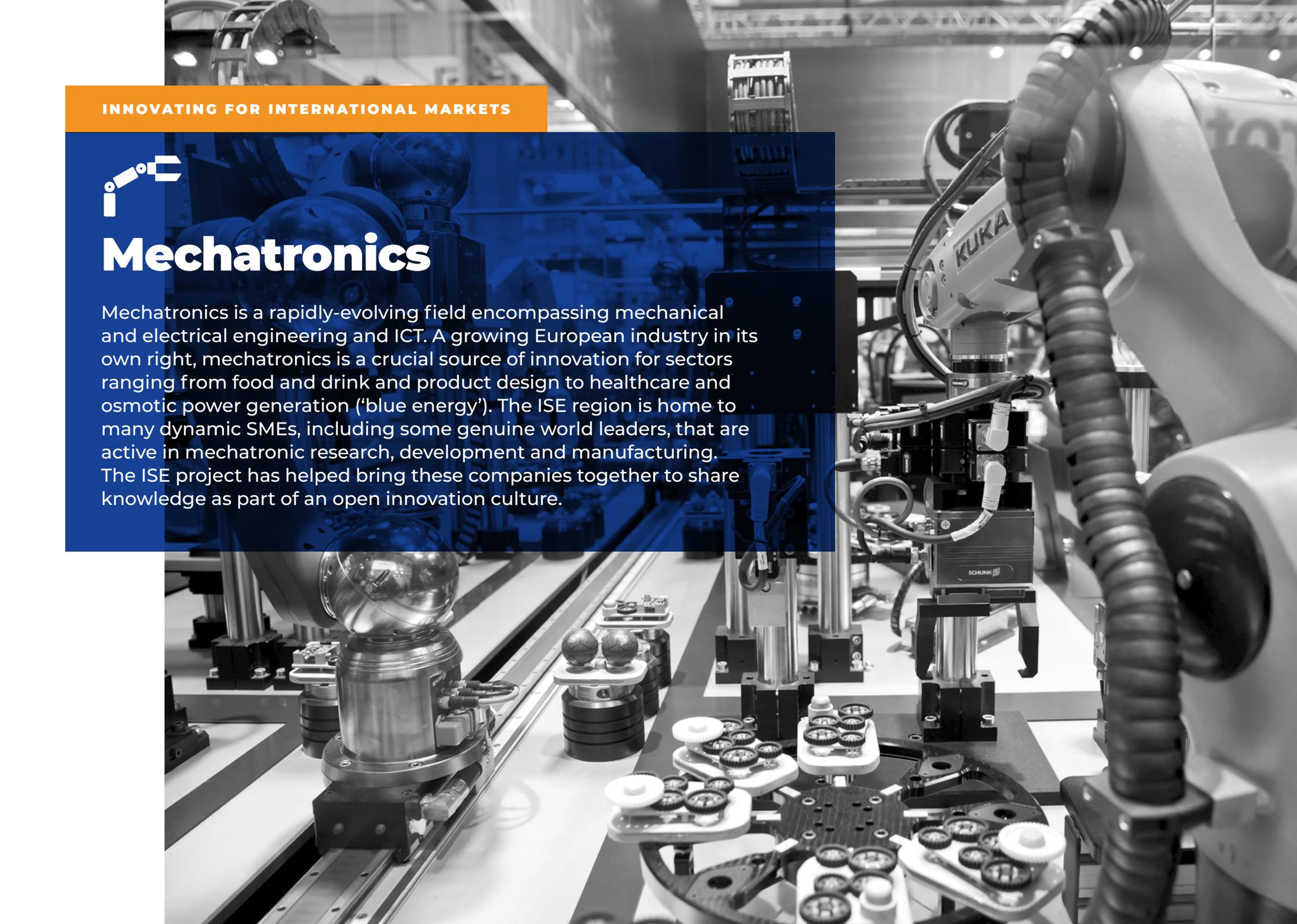


- ◆ **Reach out.** Innovators are generally only too pleased to explain their ideas and the potential applications, if you show interest and a willingness to learn. There's also a huge wealth of advice and information from local, regional national and European trade and commercial bodies. For example, if you think your business could benefit from KETs, the European Commission has produced a useful online summary of its policy, strategy and how it can help you introduce these innovative technologies and link up with partners across Europe.



[Click here to view the European Commission's online summary of its policy, strategy and how it can help you](#)

- ◆ **Be part of the solution** and share your own innovations. Collaboration and competition need not be mutually exclusive: if your innovation could help your entire sector or region to grow and prosper, it will greatly multiply the benefits to your own business.
- ◆ Innovation takes many forms, from a simple adjustment to an existing process or technique to wholesale change across your entire business. It can also be quite daunting, especially if it involves investment or restructuring. You need to weigh the costs and risks against the benefits - and make sure everyone in the business is fully on board. And remember: everyone has to start somewhere, and there is no such thing as a silly question!



INNOVATING FOR INTERNATIONAL MARKETS



# Mechatronics

Mechatronics is a rapidly-evolving field encompassing mechanical and electrical engineering and ICT. A growing European industry in its own right, mechatronics is a crucial source of innovation for sectors ranging from food and drink and product design to healthcare and osmotic power generation ('blue energy'). The ISE region is home to many dynamic SMEs, including some genuine world leaders, that are active in mechatronic research, development and manufacturing. The ISE project has helped bring these companies together to share knowledge as part of an open innovation culture.

## Technology in Motion

As its name suggests, mechatronics was originally a simple combination of mechanics and electronics. Although the term has been in use for more than 40 years, it's still widely misunderstood, with many people regarding it as synonymous with robotics or electromechanical engineering.

In fact, mechatronics is a rapidly-evolving, multidisciplinary field incorporating mechanical engineering, electronics, computer engineering, telecommunications engineering, systems engineering

and control engineering. The French NF E 01-010 standard defines it as: 'an approach aiming at the synergistic integration of mechanics, electronics, control theory, and computer science within product design and manufacturing, in order to improve and/or optimize its functionality'.

In practical terms, mechatronics seeks to unify the many different subfields of engineering emerging and multiplying as technology advances. As the technical systems involved become more complex, the definition of mechatronics continues to broaden, constantly opening up new spaces for innovation.

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The ISE region is home to many dynamic SMEs, including some genuine world leaders, that are active in mechatronic research, development and manufacturing  
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## Internet of Things (IoT)

The internet of things (IoT) is a relatively recent term. It refers to a network of physical objects that use electronics, software, sensors, actuators and network connectivity to collect and exchange data. Encompassing consumer, commercial, industrial, and infrastructure applications, the IoT covers everything from connected vehicles, home automation and wearable technology to healthcare equipment and even domestic appliances.

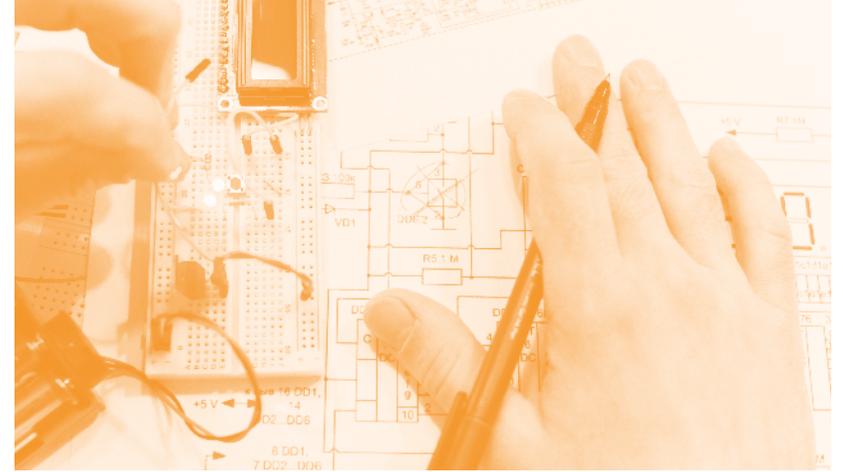
IoT and mechatronics are complementary, since many smart components associated with the Internet of Things are essentially mechatronic in nature. The growth and development of the IoT is increasingly driving research into how mechatronic systems and components are perceived, designed and manufactured. As well as the practical and technical challenges, there are important issues around data security, machine ethics and the human-machine interface to be addressed.

## Industry 4.0

The IoT is a fundamental component of Industry 4.0 – also called the Fourth Industrial Revolution – which refers to the trend towards increased automation and data exchange in manufacturing technologies. Industry 4.0 is fostering a new generation of ‘smart factories’, where cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralized decisions. These systems use the IoT to communicate with each other and with humans all along the value chain.

Industry 4.0 will rely on machines that are smart and capable of learning, capturing data and interacting with other machines, and their own operators, to achieve higher levels of flexibility and performance. The challenge for the mechatronics sector is to translate these concepts into practical, user-friendly applications.

Collaboration between knowledge centres, innovation platforms and test facilities is crucial to create new systems and networks that connect the physical and virtual worlds. Within the ISE project, these challenges present significant innovation and internationalisation opportunities for SMEs.



**Sirris and FMTC's  
Eco-mechatronics  
roadmap initiative  
has helped  
companies achieve**

**20-30%**  
energy savings

**10%**  
reduction in resource  
consumption

## Eco-Mechatronics

The ISE region is already becoming established as a leader in eco-mechatronics, an important subfield focusing on creating machines delivering a lower ecological impact and total cost of ownership, without compromising performance. This involves innovation across a wide range of parameters, including energy efficiency, recovery and storage, productivity, precision and materials savings, as well as reduced noise and vibration for improved user comfort.

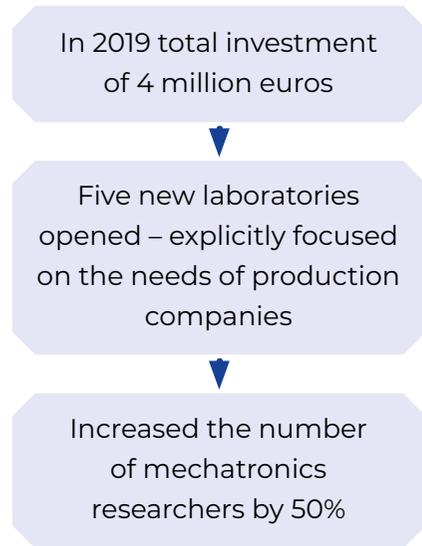
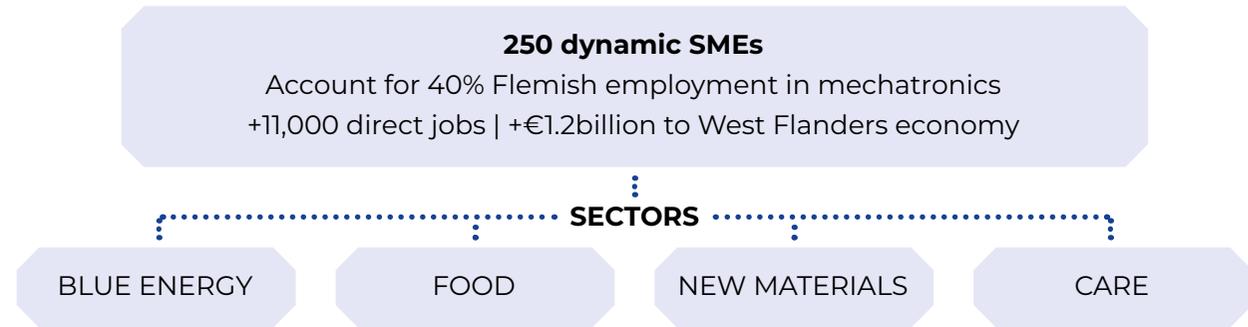
Machine manufacturers are not always aware of the potential improvements in energy efficiency, performance and user comfort they could make to their products. Since 2011, Belgium's technology organisation Sirris and research lab FMTC have run the Eco-mechatronics roadmap initiative to help companies translate mechatronics research into practical applications and integrate innovative technology into their products. The results include energy savings of 20-30%, resource consumption reduced by 10%, and noise and vibrations cut by around 8dB.

**CASE STUDY**

**Factory of The Future,  
West Flanders**

The West Flanders Machine & Mechatronics (M&M) cluster is an essential innovation partner in four key sectors where West Flemish companies rank among the best in the world.

**West Flanders Machine & Mechatronics cluster**

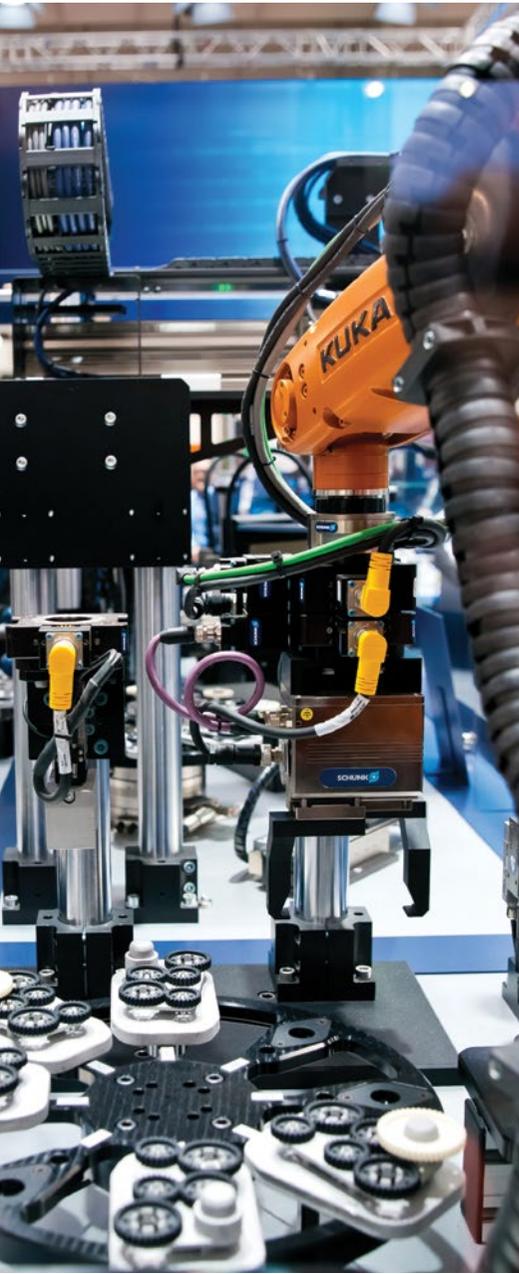


**Fabrieken voor de Toekomst  
Machinebouw & Mechatronica**

Launched in 2015, the Fabrieken voor de Toekomst Machinebouw & Mechatronica (Factory for the Future Machine Building & Mechatronics) is a partnership between the Provincial Development Agency (POM) and Technical University Alliance (TUA) West to provide SMEs with open test and innovation platforms and help them find innovation partners at home and overseas. Its ultimate vision is to expand the region’s mechatronics sector to sustain 30,000 direct jobs.

The scheme is supported by the

Competence Center Machinebouw & Mechatronica, which brings together the expertise of important knowledge centres across Flanders. KU Leuven, for example, has two innovation labs on its new campus in Bruges conducting research on cyber-physical systems and Industry 4.0; in Kortrijk, UGent and Sirris labs focus on flexible assembly and smart production organisation. The Howest technology lab has unique strengths in augmented & virtual reality, while the VIVES Maaklab focuses on innovation in manufacturing including 3D metal printing and digital measurement technology.



Initiatives like the Factory for the Future Machine Building & Mechatronics in West Flanders are important sources of information, advice and support. Other countries within the ISE region have their own schemes to promote Industry 4.0, such as the Dutch Smart Industry Agenda, which is creating five regional Digital Innovation Hubs in the Netherlands, and l'Alliance industrie du future (AIF) in France.



### Summary

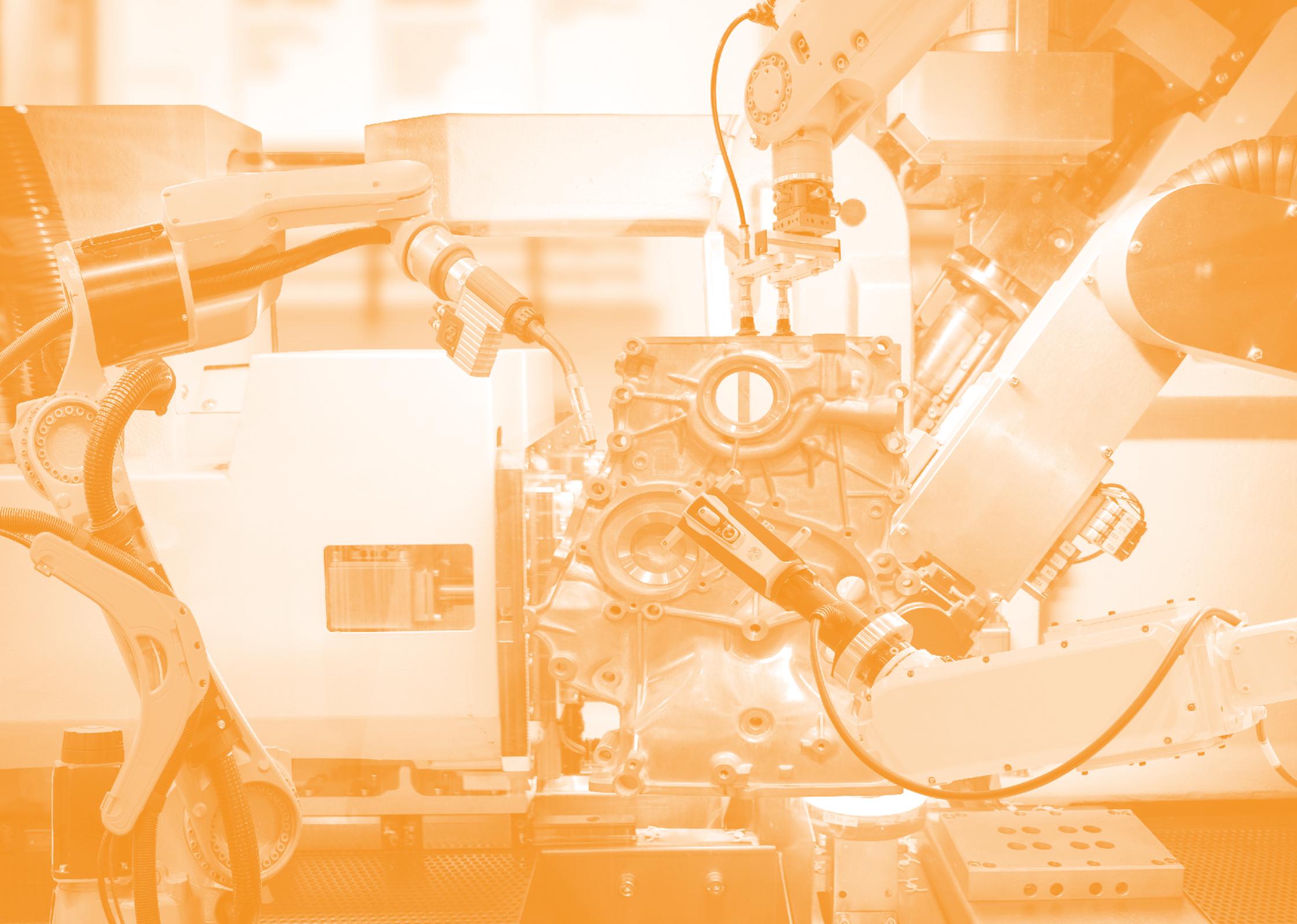
Research and industrial activities in the ISE region clearly demonstrate that the factories of the future will be based around smart technology and the IoT. As a result, mechatronics will become an increasingly mainstream field, expanding from its current base in highly technical sectors like

healthcare and blue energy into more conventional manufacturing.

For SMEs developing mechatronic systems, there are many opportunities for collaborative work with academic institutions, government agencies, regional business organisations and other like-minded companies. It's important that, as well as developing their new technologies, companies communicate the

benefits clearly and positively to potential users to promote uptake, helping to create a positive feedback loop that encourages further innovation.

For manufacturers, Industry 4.0 is already here, and the direction of travel is clear. Mechatronics and smart manufacturing have great potential to improve processes, boost efficiency and reduce costs through data sharing, connectivity and machine learning. To remain competitive in the long-term, manufacturers need to embrace this new technology; however, it's complex and evolves rapidly, which may discourage some companies. Initiatives like the Factory for the Future Machine Building & Mechatronics in West Flanders are important sources of information, advice and support. Other countries within the ISE region have their own schemes to promote Industry 4.0, such as the Dutch Smart Industry Agenda, which is creating five regional Digital Innovation Hubs in the Netherlands, and l'Alliance industrie du future (AIF) in France.

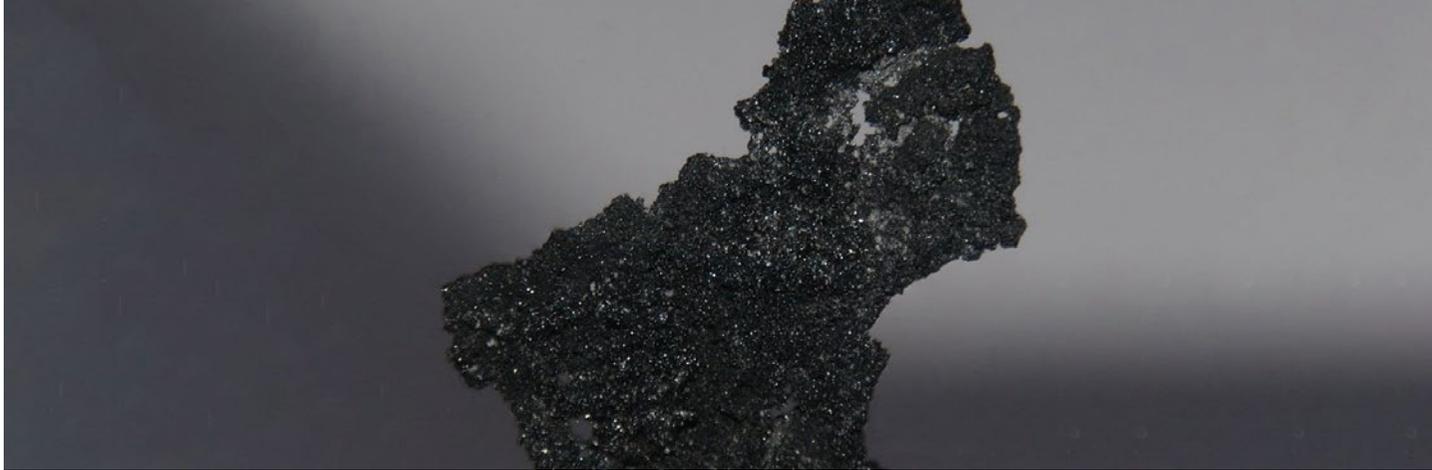


INNOVATING FOR INTERNATIONAL MARKETS



## New Materials

New materials allow us to create products and processes that improve quality of life and drive economic development. Materials like smart textiles, plastics, rubbers and composites are crucial for European industrial sectors ranging from automotive, aerospace and construction to health care and telecoms. The ISE region is home to many dynamic SMEs, including some genuine world leaders, that are active in new materials research, development and manufacturing. Working across sectors, they are important drivers of technological innovation for industries throughout Europe and beyond. The ISE project has helped bring these companies together to share knowledge and collaborate as part of an open innovation culture.



## New Materials – New Opportunities

Throughout history, human progress has been marked by advances in materials. The first revolution came when people replaced their stone tools with bronze; that metal was itself displaced by iron, then steel; today, materials like concrete and silicon are the basic foundations of 21st Century life. Bringing together various disciplines including metallurgy, ceramics, solid-state physics and chemistry and modern materials science research and innovation tends to be focused on areas such as energy, electronics, health care, infrastructure,

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Experience suggests that, over time, other 2-D materials will follow graphene’s path from the exotic to the everyday to produce an almost unlimited range of specific new materials  
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manufacturing, efficient materials and nanoscience.

The next materials revolution is set to come from the emerging world of two-dimensional materials: substances consisting of a single, lattice-like layer of atoms. Recent discoveries include graphene (carbon) borophene (boron) germanene (germanium) silicene (silicon), phosphorene (phosphorous) and stanene (tin). More 2-D materials have been shown to be theoretically possible but not yet synthesized.

Each of these materials has its own properties and potential. Graphene, for example, is stronger than steel and harder than diamond, yet lighter than almost any other known material.

It’s also transparent, flexible, an ultrafast electrical conductor, and impervious to most substances except water vapor, which flows freely through its molecular mesh. Initially more costly than gold, its price has tumbled thanks to improved production technologies: in fact, it’s now cheap enough to use in water filters, which could make desalination and waste-water treatment far more affordable. In future, graphene could be added to road paving mixtures or concrete: since it absorbs carbon monoxide and nitrogen oxides from the atmosphere, this could help to improve air quality in urban areas.

Experience suggests that, over time, other 2-D materials will follow graphene’s path from the exotic to the everyday. What’s more, scientists and engineers can mix and match these innovative compounds to produce an almost unlimited range of specific new materials for a wide range of functions. This technology presents enormous innovation and internationalisation opportunities for SMEs within the ISE region.

RAW MATERIALS

PRODUCTION

USE

RECYCLING

### Bio-based plastics

An excellent example is a group of new materials called bio-based plastics. In 2017, the Netherlands Enterprise Agency considered how these can help with a move to a more circular economy. It reached five important conclusions.

**1** Bio-based plastics generally have a positive impact on climate change compared to oil-based plastics. Plastics made from sugar crops or agricultural waste have the lowest Indirect Land-Use Change (ILUC) risk, while mechanical recycling results in less demand for raw materials compared with incineration or digestion. Composting biodegradable bio-based plastics is carbon-neutral but is favourable only when it adds value, such as increasing the amount of food waste collected to be composted and reducing the amount of oil-based plastics ending up in composting systems.

- 2** Bio-based plastics can contribute to reducing demand for fossil resources; however, they require natural resources such as fertile land, fresh water and phosphate fertilizers to grow. Using agricultural waste as a raw material has the lowest environmental impact, followed by beet and cane sugar, then maize: oil crops have the greatest impact. All can be mitigated through sustainable agricultural practices, focussing on water and nutrient management and maintaining soil quality.
- 3** Biodegradable bio-based plastics are most effective where there is either a direct use or tangible side-benefit, such as increasing separately-collected food and garden waste, and decreasing contamination with non-biodegradable plastics.
- 4** Biodegradable bio-based plastics can reduce plastics pollution in soil and water, but are not a direct solution to litter, which can only be tackled by changing people's behaviour.
- 5** In designing a circular and environmentally-optimal system, mechanical recycling is a good option, and the input is sustainable; however, it only becomes economically viable above certain volumes. Bio-based plastics that are chemically identical to their oil-based counterparts (such as bio-PET) are already recycled; in a truly sustainable circular system, mechanical recycling should be optimised, and the additional primary input should be as sustainable as possible.

### Summary

There are endless possibilities for SMEs to make use of new materials in their products or production processes. These materials can be manipulated to give very precise characteristics, allowing companies to find better, more functional or more cost-effective alternatives to existing materials and methods. Switching to bio-based plastics, for example, could help businesses improve their environmental and ethical credentials and provide a real competitive point of difference. New materials can also help businesses grow and expand into new markets by enabling them to turn new ideas and concepts into practical realities.





## CASE STUDY

### Bio-based Plastics in Packaging

In 2015, bio-based and biodegradable plastics accounted for just 1% of total global production, but it's been predicted that this will more than double by 2020. At present, these plastics are generally more expensive than oil-based plastics by weight; however, costs are more stable since they are not affected by fluctuations in oil prices – and with future economies of scale in production, prices should start to fall.

### Food Packaging

Most bio-based and biodegradable plastics are currently used in food

packaging and foodservice ware. Materials like bio-PE and bio-PET are identical to their conventional equivalents and can be used in exactly the same applications: other materials like PLA, starch-based plastics and cellophane have specific properties and require certification for food use.

### Sustainability issues

Crops grown to produce bio-based plastics currently occupy just 0.02% of the global arable area. This would rise to around 5% if these materials replaced worldwide oil-based plastics production.

However, research shows bio-based plastics and food can be produced

sustainably together: if combined with biofuel production, it may help stabilise food prices, providing farmers with more secure markets. Consumers benefit too, with materials like PLA helping food to stay fresh longer, extending sell-by dates.

### End-of-life options

Biodegradable plastic food packaging (and rubbish bags) can help ensure a larger share of domestic kitchen waste goes for industrial composting – a form of organic recovery or recycling – rather than to landfill. However, there is a risk that people will use non-compostable, oil-based bags in their green bins by mistake: at present about 1% of kitchen waste is non-biodegradable plastic. Biodegradable plastic packaging can also be incinerated, allowing energy recovery. A new pictogram showing how these materials can be disposed of has been introduced in the Netherlands.



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