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#3 Autumn 2021

The digital transformation of industry

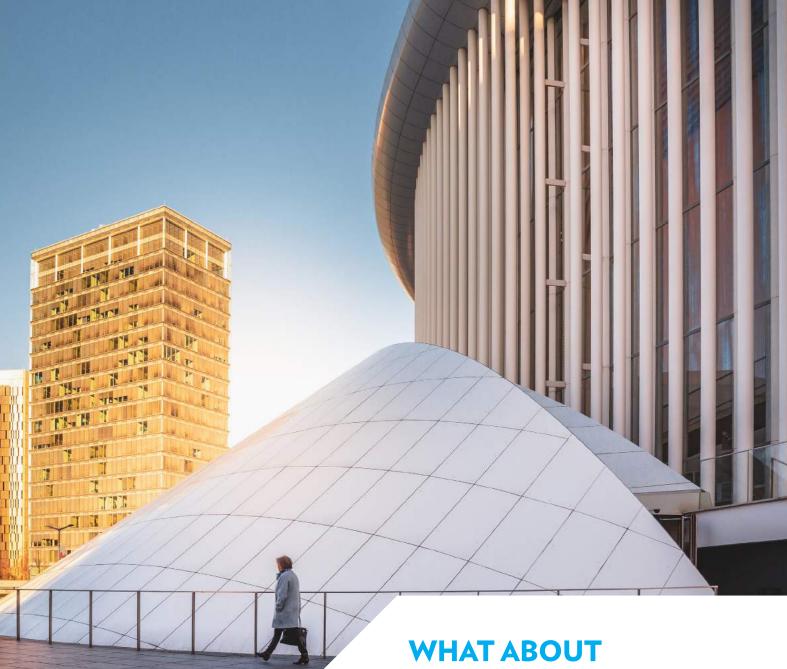
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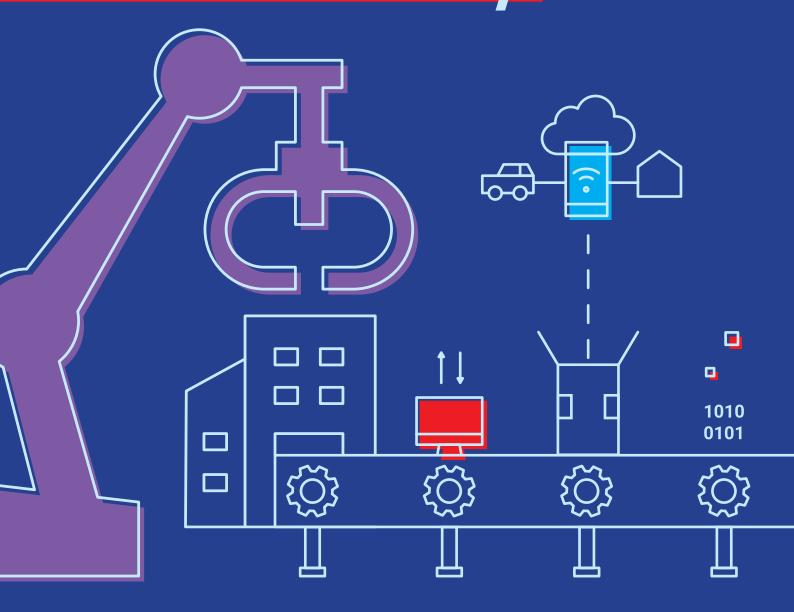
The diversity you find in Luxembourg enriches our work and helps us perform better, not least in the contacts with our international partners and clients.

Jean-Michel Ludwig,

Director Business Development, Luxinnovation

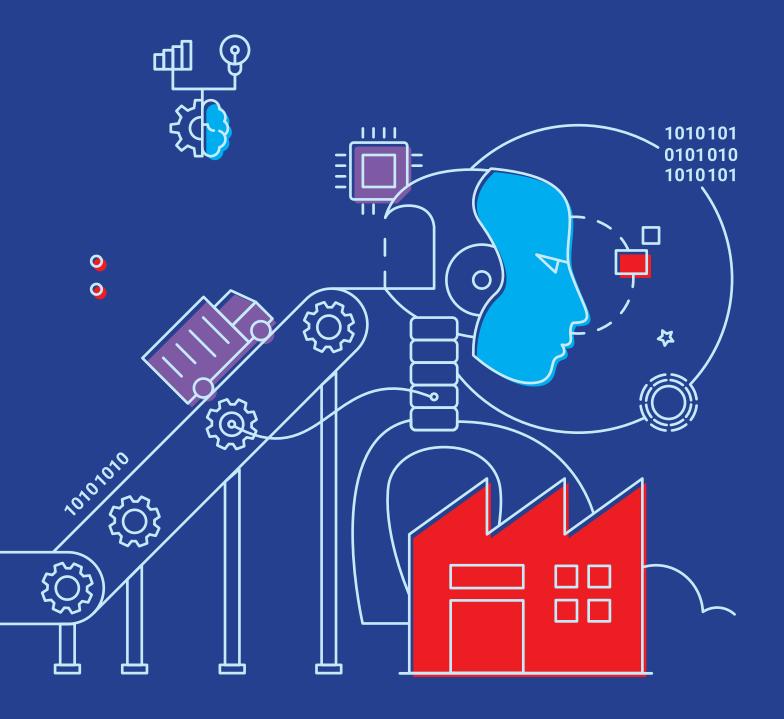


The digital transformation of industry



Artificial intelligence, the internet of things, virtual simulations, machine learning _ a host of new, digital technologies is radically changing industry and making it more agile, responsive,

efficient and sustainable.
Key industrial players in
Luxembourg are at the
forefront of the "industry
4.0" movement, benefitting
from the country's digital
capacities and data-driven
innovation strategy.



On the road to smart manufacturing

Several large industrial groups have chosen their Luxembourg sites to pilot the digital transformation of their production. The country is mobilising resources in order to generalise their success.

Once one of the world's leading steel producers,
Luxembourg has a solid industrial past. Industry continues
to play a key role in the economic fabric, today with
a strong focus on high value added, R&D-intensive activities.
Adopting an industry 4.0 approach – i.e. intelligent
networking of machines and processes based on information
and communication technologies – is central for the future.

"This is the only way to maintain our competitiveness," says Georges Santer, Head of Digital and Innovation at employers' association FEDIL – The Voice of Luxembourg's Industry that brings together the country's main industrial players. "Technologies such as the internet of things, virtual simulation, artificial intelligence, big data, high performance computing, smart grids and so on are transforming our current industrial model."

Luxembourg: a strategic industrial location

A number of international industrial players are using their Luxembourg production facilities to trail-blaze their move to industry 4.0. "Husky Injection Molding Systems has used its production site here to develop and implement an end-to-end digitalised production process, Goodyear has invested \$77 million in a highly automated tyre manufacturing plant, and other large firms such as Cebi, Sisto Armaturen, ArcelorMittal and Ceratizit are running ambitious digitalisation projects," exemplifies Caroline Muller, Luxembourg Materials & Manufacturing Cluster manager at Luxinnovation.

The reasons for this? "I think this reflects the strengths of a country that has always been visionary and willing to test new things," says Arnaud Lambert, who heads the Luxembourg Digital Innovation Hub (L-DIH) at Luxinnovation, which supports industrial companies in their digital transformation. "Many of these large groups have R&D and innovation centres in Luxembourg, and it is natural for them to conduct digital innovation here. Luxembourg is also often seen as a neutral location. International groups see it as a good place to conduct pilot projects that will then be taken up by production sites in different countries across the world."

















Business-oriented high performance computer

Supporting the digitalisation of industry and creating a resilient industry 4.0 sector is high up on the agenda of Luxembourg's data-driven innovation strategy, and a natural continuation of the investment in digital infrastructure that the country has been doing for decades. "The technological infrastructure available here in terms of connectivity and access is definitely not a given everywhere," Mr Lambert points out.

Luxembourg's business-oriented high performance computer (HPC), MeluXina, has specifically been designed to meet business needs and makes 65% of its capacity available to companies – start-ups and SMEs as well as large industries. "Industry 4.0 generates enormous amounts of data, not only from within companies themselves but also from their value chains as different parts are becoming connected. Processing them requires considerable data power," says Mr Lambert. "MeluXina is the first HPC in Europe that you can have access to without going through a research project implemented together with a university. This is really HPC for everyone, with experts available to guide those less accustomed to working with supercomputers."

Partnerships proximity

Most companies do not have all necessary skills in-house to succeed with their digital transformation. A number of projects are being implemented in partnership with the University of Luxembourg's Interdisciplinary Centre for Security, Reliability and Trust (SnT) or the Luxembourg Institute of Science and Technology (LIST). The L-DIH also connects companies with service providers that can contribute with skills, technology, project management, consulting and so on.

"We have a well developed national ecosystem where public, private and academic players are close – not only geographically but also in terms of mindset," comments Mr Lambert. "The large industrial players have attracted a range of specialised service providers in the digital field, and we also benefit from the expertise gained through Luxembourg's financial sector. In case we do not find the right fit nationally, our colleagues in our neighbouring countries – which have dense industrial landscapes – or further away in Europe, help us to identify suitable partners in their countries."

Luxembourg-based companies can also apply for government R&D and innovation subsidies and benefit from Luxinnovation support to prepare their projects. "Such support considerably facilitates the launch of digitalisation projects, in particular among small and medium-sized enterprises (SMEs) that make up the biggest part of our industrial sector," says Ms Muller.

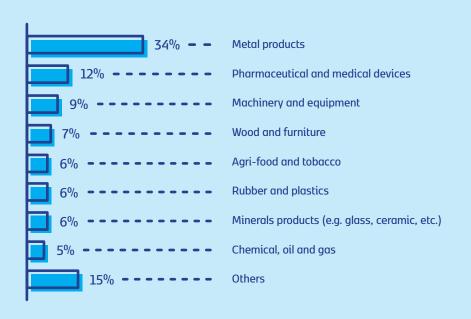
Encouraging smaller companies to embrace the digital transformation is a priority. "Industry 4.0 does not only change value creation processes, but also gives birth to new business models and new perspectives for employees," comments Mr Santer. "Intelligent, digital production processes offer great opportunities, especially to SMEs."

Human at the centre

While digitalisation helps companies become more agile, efficient and cost-effective, there are also other long-term advantages, notably for the environment. "Sustainable manufacturing is an important pillar of industry 4.0," Ms Muller points out. "Digitally enabled production processes often makes it possible to consume less energy and materials and to lessen the CO₃ footprint."

The sustainability aspect is central for Luxembourg. Mr Lambert thinks its industry of the future will be really innovative and state-of-the-art. "We will continue to have physical, cutting edge industrial production here, but I think that the digital aspects of industry will become increasingly important. With the tools that we invest in – the new HPC and a future secure data exchange platform, for example – Luxembourg can play a key role in this field."

However, the main key to success is the people involved in the process. "Digital transformation impacts all aspects of an organisation," underlines Mr Lambert. "The company culture, the internal understanding of why and how this transformation takes place and the willingness to change are essential. The digital and human interaction has to be strong and complementary. The close personal relationships in our business and research community will be a key asset in the years to come."



60%

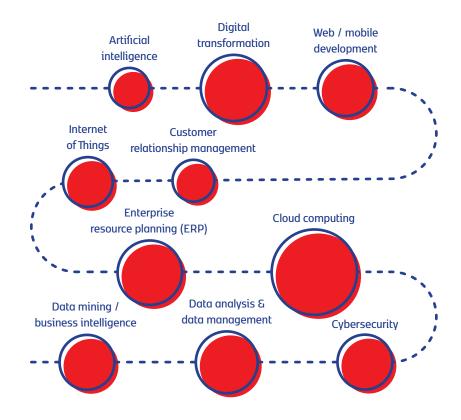
Companies with manufacturing as their core business



40%

Industry 4.0 enablers

Text: Lena Mårtensson Photo: Laurent Antonelli Source: Luxinnovation Infographic: Quattro Creative















The strong infrastructure, skills and research partners make Luxembourg an interesting location for industrial digital transformation projects. Armacell and Cebi both drive their global industry 4.0 processes from their headquarters located here.

Technical insulation and engineered foam manufacturer Armacell and Cebi, which specialises in electromechanical products for the automotive and household appliance industries, both have over 3,000 employees and manufacturing sites across the world. Succeeding with their digital transformation is a must.

"During the past 10-20 years, the complexity of our company and of the industry that we serve has increased considerably," explains Guillaume Policarpo, Industry 4.0 Programme Manager at Cebi. "We have more employees, more machines, more processes and more product references, and our production has become much more versatile. We need digital tools to be able to manage this complexity and adapt to the needs of our customers."





skills, technologies, applications and solutions at the Luxembourg plant, which will then be replicated across its locations worldwide. "We have come around 70% of the way," Mr Policarpo comments. "Today, we have a big data lake hosted on our centralised infrastructure and are developing a data analytics platform that provides dedicated dashboards for the operational teams."

The analytics platform is created in cooperation with DataThings, a Luxembourg start-up specialised in developing intelligent software systems aimed at transforming data into actionable insights. Another key partner is the University of Luxembourg's Interdisciplinary Centre for Security, Reliability and Trust (SnT) that helped Cebi define how to collect data and deploy the digital infrastructure in an optimal way. Other important focus areas for collaboration with the SnT include cybersecurity and machine learning.

"Luxinnovation, the national innovation agency, supported us with setting up the joint R&D project with SnT and DataThings, and we received an R&D subsidy from the Ministry of the Economy," Mr Policarpo points out. Openness to partners is central for the company, which recently made its state-of-the-art testing laboratory accessible to external users. "Our equipment is being used more efficiently, and we get an opportunity to learn from other companies. It is a win-win situation."

Innovative environment

Armacell also uses its Luxembourg HQ as the base for a digital transformation project, the outcomes of which will be implemented globally. Its vision is to digitalise in order to enhance its operational efficiency as well as its value to customers and employees. Chief Information Officer Laurent Couturier has taken the strategic decision to grow his IT team in Luxembourg with skills in the fields of cloud infrastructure, cybersecurity and software development.

"Luxembourg is centrally located in Europe, which is an advantage for an international company dealing with different time zones," he points out. "The country is also investing a lot of effort into being a major player in the digital world. We are benefitting from this momentum to find the right partners, technologies and innovations that we want to implement. If we want to succeed with innovation, we need to be in a place where people innovate. I think Luxembourg is the right place for this."

One of Mr Couturier's priorities is to create more positions in the company that are at the frontier of manufacturing and IT. "We want to connect engineers who see how their production lines can be improved with IT experts who can make it happen. There are a lot of ideas in the field, and if we can capture them we can transform them into innovation."

















Artem Yukhin, CEO





What is your field of expertise?

"We specialise in creating world-leading 3D scanners. Our current pioneer scanner collects giggbytes of information within minutes: an exact digital copy of the object, measurements with submillimetre precision and colours with photographic quality. It is also the first handheld scanner with a built-in touchscreen display and that does not require any connection to a computer, but uploads all data directly to the cloud. Our product range also includes a long-range laser 3D scanner for capturing large objects – big machinery, airplanes, buildings, etc. – and a desktop scanner for very small items."

How do your clients use your scanners in the context of industry 4.0?

"Our industrial clients use them for reverse engineering of missing parts and products, which are scanned so that their digital image can be used as a basis for production on demand. Another common application is quality inspection and the quality control of 3D-printed objects. The scanners are widely used by the automotive industry – our clients include Toyota, Tesla and Mercedes, for example – as well as the aerospace, big machinery, furniture and fashion sectors."

How do you work with the Luxembourg business community?

"We moved our headquarters here from California in 2010, and also have an in-house electronics production line here. We have done very interesting research projects with the University of Luxembourg, and national innovation agency Luxinnovation has put us in contact with industrial companies."





Wizata

What is the target group of Wizata?

"We work with manufacturing industry in fields such as metals, mining, oil, energy and chemicals. Industrial engineers are constantly taking very complex decisions about how to use the assets of their plants in the best way possible. We help them optimise their decisions using data obtained with new technologies such as the internet of things, artificial intelligence, machine learning and digital twins."

How do you support your clients' industry 4.0 projects?

"We have developed a digital platform that industrial companies can plug into their own systems in order to connect, manage and organise data flows stemming from their machines, production lines and facilities in one single place. The information obtained can be used for smart monitoring, industrial automation, preventive maintenance, anomaly detection, and so on."

How does your base in Luxembourg help you interact with international customers?

"Luxembourg has a strong past in heavy industry and retains an excellent reputation in the field of advanced engineering which we can benefit from. On top of that, the country conveys an image of trust. When taking the decision to entrust us with access to their data and machinery, our customers feel reassured by the trustworthy image we have as a Luxembourg-based company."



Luxrobotic® - Zeltic Group

What is your field of expertise?

"We support industrial companies with robot solutions and the automation of industrial processes. We provide consulting services to help our customers design projects all the way from idea to detailed specifications and evaluate all aspects – technical, financial, ergonomic, man-machine interactions, and so on. In some cases, we also provide tailor-made turnkey solutions and manage not only the development of the specifications and all necessary prestudies, but also take charge of ordering and programming the robots and associated devices, developing the tooling and training the users. Sometimes, we develop our own software designed to meet clients' specific needs."

How do you contribute to your customers' industry 4.0 projects?

"Automation is a key aspect of industry 4.0. As we also take the whole data dimension into account, we also contribute to their digitalisation and use of big data and the internet of things. My ambition is also to support our clients with improving their production through the use of artificial intelligence."

Who are your clients?

"We work with manufacturing companies in the medical, automotive, mechanical, cosmetic, engineering, food and environment sectors, and also provide some support to schools. Most of our customers are located in Luxembourg, as well as in the surrounding regions in France, Belgium and Germany. We have found an attractive niche market here."



Texts: Lena Mårtensson
Illustrations: Quattro Creative



Virtual Rangers

What is your field of expertise?

"We specialise in creating virtual experiences, using virtual reality (VR) and augmented reality (AR). We provide our technology and knowhow as a service to companies in a variety of sectors – industry, banking, healthcare, culture, etc. – that want to digitalise and innovate."

What type of solutions do you provide to companies wanting to adopt an industry 4.0 approach?

"I have often seen VR being showcased as a fancy feature at trade fairs without any real use. Our vision has been to develop solutions that would really be implemented and bring added value to our clients. We provide training solutions based on VR and digital content to industrial companies used for teaching staff to handle highly specialised equipment to which access is limited, for instance, or to deal with really high-risk accidents such as a leakage in a steel mill. We also provide virtual marketing solutions making it possible for clients to discover new products in AR and view them from all angles in their own living room."

How important is Luxembourg to you as a market?

"Luxembourg is our showcase market that we have used to understand the needs and develop our offering.

After having implemented over 65 projects and trained more than 5,000 people since our start in 2017, we are now partnering with our first international customers. However, Luxembourg remains important. If you are innovative, people here push you and help you to reach your full potential. I would recommend anyone to set up a company here."

Photo: Marie De Decker

Hard material solutions specialist Ceratizit is in the process of implementing an ambitious industry 4.0 approach with sustainability and improved efficiency at its very centre.

With over 25 production sites and 7,000 employees across the world, the Ceratizit Group is the global market leader in various application segments for its highly specialised cutting tools, indexable inserts, rods made from hard materials and components for wear protection. Its operations are coordinated from its global headquarters located in Luxembourg. This is also where its digital transformation is taking shape.

Data mining for facts-based decisions

Connecting different types of data and turning them into actionable information is at the heart of the process. "In order to maximise our efficiency, we need to take decisions based on facts," says Executive Board Member Thierry Wolter. "We have been collecting data for decades, but the challenge has always been to use it in a meaningful way. That is what we are focusing on today."

Projects are now underway to connect the entire production process with the machine execution system in order to improve process parameters, implement data-based quality assurance and increase efficiency. A digital twin used for predicting the expected outcome depending on the exact characteristics of the input will also be built. "The raw materials that we use are all subject to fluctuations, not least as 83% is recycled," explains Mr Wolter. "We know from experience how to compensate for

Thierry Wolter, Ceratizit Group

Compared to many other countries, Luxembourg has a long history of supporting innovation.

the fluctuations to get the same end product, but we now use data to optimise efficiency, process parameters and quality measures." In addition, Ceratizit is implementing machine learning algorithms aimed at reducing its environmental impact.

All these projects involve processing huge quantities of data about a wide range of parameters, and it is very difficult to establish cause-effect links. The solution is to use artificial intelligence. "Fortunately, Luxembourg has a very good nucleus of companies specialised in this field. We work together with innovative start-ups such as EarthLab Luxembourg and university spin-off DataThings."

Sustainable customer links

Ceratizit produces both standard products and solutions adapted to customers' specifications. A new digital ordering system allows clients to configure certain solutions online. Once they submit their requests, the drawing of the product is immediately ready and can go straight into production.

To help customers optimise their use of Ceratizit's tools, the company offers the ToolScope monitoring and control system that continuously records signals generated during the production process. Data collected is used to monitor and adjust the machines in real time and to analyse correlations in hindsight. Its LiveTechPro remote support app allows

Ceratizit to provide technical advice and support to customers without first having to travel to their production sites.

"These tools improve their efficiency, but they also have positive environmental effects as they make it possible to reduce both CO2 emissions and waste," Mr Wolter points out.

Innovation mindset

With over 200 R&D experts in-house and cooperation with the University of Luxembourg, the Luxembourg Institute of Science and Technology (LIST) and Montanuniversität Leoben in Austria, Ceratizit has a strong focus on innovation. "Compared to many other countries, Luxembourg has a long history of supporting innovation," claims Mr Wolter.

However, he underlines that succeeding with industry 4.0 is not only a matter of technological development.

"The people dimension is extremely important. We have to make sure that we bring our employees along on the digitalisation journey and help them and their roles evolve. Finding the right staff is always a challenge, but I think it is easier in Luxembourg than elsewhere because the country is so open and international. We find good people here."

Text: Lena Mårtensson Photo: Laurent Antonelli

















Highlighting a mature ecosystem

Startup Luxembourg launched its brand new website on 5 July 2021. Its aim? To showcase the Luxembourg start-up ecosystem internationally and to facilitate networking.

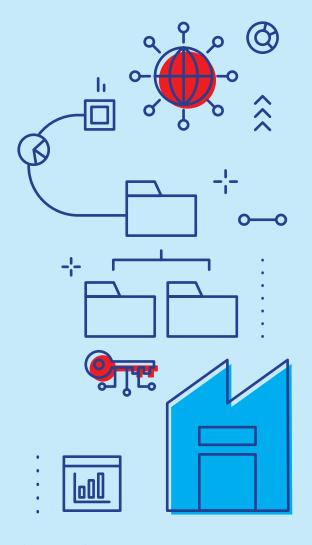
"Our ecosystem has reached a certain level of maturity. Now is the right time to focus our efforts on promoting it beyond our borders," said Sasha Baillie, CEO of Luxinnovation, at the launch of the Startup Luxembourg platform.

Benefitting from its manageable size, which facilitates and accelerates connections, and its vision to work with public and private partners in a climate of trust, Luxembourg has been able to create a start-up ecosystem that reflects its image.

19,000 followers on social media

Today, the country is home to more than 500 young innovative companies, a dozen or so acceleration and internationalisation programmes, and a whole range of public funding measures designed for start-ups at all stages of maturity.

The Startup Luxembourg platform responds to the needs and wishes of the local community and to growing interest abroad. It counts almost 19,000 followers on its social media channels.



Creating synergies

The platform highlights the start-up ecosystem and its players, and brings together the latest news about start-ups in Luxembourg. At the international level, it features all the advantages that the country can offer to young innovative companies and provides direct contacts with incubators, start-ups and institutional players.

"Startup Luxembourg helps start-ups to find the right partners in Luxembourg and discover the business landscape," says Stéphanie Silvestri, Senior Advisor Start-up Acceleration at Luxinnovation. "Its objective is to facilitate cooperation and create synergies between different players in the market."

"There is no competition between the various incubators," confirms Sébastien Wiertz, CEO of incubator Paul Wurth Incub. "We are happy to help start-ups from other incubators with specific needs."

startupluxembourg.com

Mapping the Luxembourg start-ups

Texts: Jonas Mercier
Illustrations: Quattro Creative

Luxinnovation recently published the first mapping ever done of Luxembourg's start-up sector. Accurate knowledge of the national start-up ecosystem is crucial in order to accelerate its development, highlight its strengths and fill any gaps.

The brand new mapping covers companies established in Luxembourg that are less than 10 years old, have significant growth potential as well as international ambitions and use new technologies to provide innovative solutions, services or business models. Luxinnovation's start-up experts analysed each company in order to select only those that meet the criteria, particularly in terms of innovation.

Providing a correct snapshot of Luxembourg's diverse start-up ecosystem is a challenging, but crucial, task. "This data will notably be used to support policy-making and improve its impact," explains Mohamed Toumi, Market Intelligence Analyst at Luxinnovation.

Startup
Luxembourg helps
start-ups to find
the right partners
and discover
the business
landscape.

Digital and data-related

The mapping clearly shows the steady growth in the number of start-ups being incorporated each year in Luxembourg, with increased specialisation in sectors driven by digitalisation and sustainability trends.

Half of the start-up's develop innovative solutions based on big data, cybersecurity, artificial intelligence, blockchain and virtual or augmented reality technologies. They target in particular the information technology, finance, health, creative industries and space sectors. The application sectors that have experienced the highest annual growth rate in terms of start-ups created over the past five years notably include space, cleantech, leisure and e-commerce.

The start-up mapping is a living exercise. "Given the dynamic nature of the start-up ecosystem, it will be updated every six months," concludes Mr Toumi.















News

News

EVENTS Luxembourg on display to the world



The Luxembourg pavilion is making a name for itself at the Expo 2020 Dubai, which will run until next spring.

Since 1 October, Dubai has been hosting the World Expo 2020, the schedule of which was postponed by one year due to the COVID situation. In the "Opportunity" district, the Luxembourg pavilion has not gone unnoticed.

The building, designed by Shahram Agaajani's Metaform architectural firm, was inspired by the Möbius strip. 50 metres wide, 21 metres high and set in a space of 3,500 m^2 , it offers visitors an interactive experience over three floors. Its infinite shape symbolises the openness, dynamism and circular economy aspects of the country.

The pavilion, which can accommodate up to 500 people at a time, is the only one of the 190 or so pavilions to feature a slide from the top of the ramp to the ground floor atrium. Entering the building via a ramp, visitors are introduced to a visual and audio scenography created by the German company Jangled Nerves, which highlights the diversity,

connectivity, sustainability, entrepreneurship and beauty of Luxembourg.

"It was important to highlight the sectors where we could present ourselves in a modern, innovative and agile way," comments the director of the Luxembourg Chamber of Commerce, Carlo Thelen.

The country's rich steelmaking past is also being honoured, with 170 tonnes of structural steel sections produced in Luxembourg being integrated directly into the pavilion structure.

At the end of the World Expo, on 31 March 2022, the Luxembourg pavilion will not be dismantled: it will be handed over to the Dubai authorities, who have decided to keep the most beautiful buildings in the Expo area in order to create a new activity zone mixing housing and business facilities. At the previous World Expo in Shanghai in 2000, the Luxembourg pavilion welcomed more than 7 million people, about 10% of the total number of visitors who came during the six months of the event.

Texts: Jean-Michel Gaudron

SUSTAINABILITY

The greenest supercomputer in Europe

Inaugurated in June 2021, Luxembourg's high performance computer MeluXina has been ranked as the greenest supercomputer in the EU and the 4th greenest in the world. It also ranks 36th among the most powerful high performance computers in the world.

MeluXina's system is water-cooled, which removes the high operational costs of air-cooled systems and, in parallel, reduces the energy footprint.

Unlike most HPCs that are pure research infrastructures, 65% of MeluXina's capacity is available for start-ups, SMEs and large companies. It provides a robust platform for science and industry for years to come.

RANKING

Luxembourg a "strong innovator" in the EU

Luxembourg ranks 7th in the 2021 edition of the European Innovation Scoreboard, that has been published annually since 2014 in order to provide a comparative assessment of the research and innovation performance of EU member states and selected third countries.

Behind the "innovation leaders" Sweden, Finland, Denmark and Belgium, with an innovation performance well above the EU average, Luxembourg appears among the highest-ranked countries of the second group, "strong innovators", which also includes the Netherlands, Germany, Austria, Estonia, France and Ireland.

The country's strongest performance is in the category "attractive research systems", where it scores 184.5, compared to the EU average of 100. The high score is in particular due to the exceptionally high number of foreign doctoral students (indexed 297.3).

HEALTH TECH

5 digitalisation market trends

The report *Digitalisation of the health sector: Market trends* by Luxinnovation reveals 5 market trends linked to the digitalisation of healthcare. These trends are expected to drive post-COVID recovery strategies and, eventually, profoundly transform current healthcare ecosystems.

They are (i) Shifting from disease treatment to prevention and health management; (ii) Setting up a customer-centric care delivery; (iii) Implementing a personalised care journey; (iv) Building resilient healthcare systems and (v) Creating a collaborative, compliant and innovative environment. The report also underlines the importance of cooperation in the healthcare ecosystem, and of including non-traditional healthcare players such as digital companies in strategic reflections.

DATA ECONOMY

Monaco opens data embassy in Luxembourg

Luxembourg is renowned for its top-of-the-range data infrastructure. One of the best indicators of its trustworthiness is the fact that Monaco has followed in the footsteps of Estonia and opened a data embassy here.

The decision to open the data embassy was sealed in July 2021, when Luxembourg Prime Minister Xavier Bettel and Monegasque Minister of State Pierre Dartout signed an agreement regarding the hosting of Monegasque data and information systems in Luxembourg.

"This agreement is a first step towards a strengthened partnership in the digital field between our two countries," underlined Minister Dartout. "I am delighted with this arrangement proposed by our Luxembourg partner, which provides the Principality with a backup solution for this data, preventing any major risk."















3D PRINTERS

Anisoprint from Russia to Luxembourg



The Russian start-up recently moved the production of its pioneering 3D printers for composite materials to its headquarters in the Grand Duchy and has started shipping 3D printers made in Luxembourg to customers.

After looking for the ideal location to promote and sell its highly innovative 3D printers in the European market, Russian start-up Anisoprint moved its headquarters to Luxembourg in 2018. In 2020, the decision followed to move the manufacturing of its printers here as well.

Initially relying on contract manufacturing, the company realised that this required considerable work to manage quality control and deadlines. The outbreak of the COVID-19 pandemic and the related supply chain disruptions prompted the decision to start producing the printers in-house.

"Since the first launch of our products back in 2018, we constantly looked for an ideal manufacturing solution, trying to balance between the quality, customer proximity, logistics and lead times, predictability and cost," explains

CEO Fedor Antonov. "After careful consideration of every option and location, we made the decision to set up our own production facility in Luxembourg, next to our head office."

"The best solution for a manufacturing facility"

As reasons for this decision, Anisoprint notably highlights the country's central location in Europe, its logistics hub and its convenient tax regime for export production. "We stopped at nothing to find the best solution for a manufacturing facility and find professionals who are willing to contribute their expertise for making the quality of the machines even higher and live up to the expectations of our customers," underlines Dr Antonov.

Adding in-house production to its activities, Anisoprint has now also received a "Made in Luxembourg" label from the Chamber of Commerce. The label is awarded to companies that comply with all local regulations and provide high-quality products or services to their customers. "We are proud to receive a 'Made in Luxembourg' label for the first batch of Composer 3D-printers manufactured in our new facilities." Dr Antonov concludes.

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International talent



We might live in a globalised world, but when it comes to doing business, speaking the clients' language and understanding their culture is still paramount. As the most international

country in the EU with a long track record of attracting talents, Luxembourg has much to offer companies looking to set up outstanding international teams.



Talents

Multination to the core

Luxembourg has the most international population in the European Union, and a workforce that stands out for its multinational character. This is not only a huge asset for companies addressing the European and global markets, it also creates businesses with a truly international mindset from the word "go".

Take a walk down any busy street in Luxembourg, and you will soon hear the buzz of many different languages and meet people from all over Europe and the world. Walk by a playground, and you will hear parents discussing in Spanish, French or Romanian while children who might speak Polish or Chinese at home, use Luxembourgish, or perhaps English, as their common language to communicate with their playmates.

Luxembourg's long tradition of welcoming international workers started when the country was one of the world's leading steel producers, and has continued as it built its international financial centre and became home to a number of European Union institutions. Today, its high-tech industries, such as the buoyant commercial space sector, attract highly skilled experts from near and far. 53% of the population are Luxembourgers, while the remaining 47% are made up of a blend of over 180 nationalities. The country has three official languages – Luxembourgish, French and German – and English is widely spoken, in particular in the business community.

A base for European business

This makes Luxembourg an attractive location for companies that are targeting the European, or even the global, market. "Companies who choose Luxembourg as their base can easily



Patrick Kersten, a Luxembourg serial entrepreneur who todays heads IT consultancy and recruitment company Vesperia, agrees. "The international workforce is definitely a reason for companies to settle in Luxembourg. At one point, one of my previous start-ups, Doctena, had a team of 20 including 14 different nationalities. That is an incredible experience for everyone: it gives you a unique company culture and keeps you motivated to listen to others. Your business structure will be international and your products multilingual from the very beginning – a key advantage, as otherwise you have to restart and modify every time you want to reach a new market. Your main strength will be the diversity of your team members and their experience."

Easy to attract talent

successful market entries."

Companies looking for highly skilled staff are not limited to the national market. "A large proportion of Luxembourg's workforce









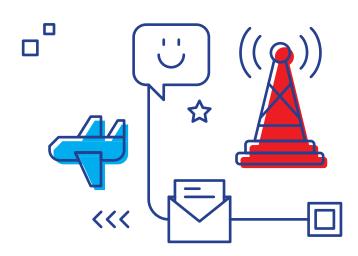












Any organisation planning to create a team in Luxembourg will find themselves with a multicultural and diverse group of people. Amazon, one of the country's largest employers, and fast-growing scale-up Tadaweb speak about how this diversity contributes to their development.

Like many start-ups, Tadaweb kicked off its activity in 2011 with one employee, an investment of €70,000 and a bright idea: creating a small data platform able to scale human intelligence for gathering and analysing information on the internet. Ten years later, the company has grown to almost 100 people and has offices in Paris and London besides its Luxembourg headquarters, where most of the staff is located. A new office in Canada is underway.

Varied perspectives for better performance

The current Tadaweb team is made up of 23 different nationalities. "In the beginning, the main language spoken in our offices was French," says co-founder Genna Elvin, who herself is from New Zealand. "As the team grew, we needed to change our dialogue to English and invested a lot in language courses to facilitate this transition. However, having so many cultures and nationalities has been great. Our staff offer very different takes on how products should be developed, how meetings should be run and how the company should grow. They really challenge the traditional way of doing things, which is completely beneficial for us."



E-commerce specialist Amazon has a similar experience. "When you bring in diverse people, you also bring diverse perspectives," says Anne-Marie Husser, Director for Human Resources and International Consumer in France and Luxembourg. "One of our leadership principles is 'disagree and commit' – we like to have healthy debates, and they happen when you have people around the table with different perspectives, experience and cultures. At the end of the day, you make better decisions and offer better services to clients than if everyone was thinking in the same way."

Amazon had around 3,000 employees at its European HQ in Luxembourg in 2020, and expects its team to grow by 20% in 2021 to 3,600. Activities hosted in Luxembourg include, among others, the company's central e-commerce and operations functions, Amazon devices, cloud computing activities, and legal and financial support services. "We have employees from all over Europe as well as from the US, India and the rest of the world," explains Ms Husser. "If you want the best talents, you need diverse people, and we believe that our company should look like the society we live in and like our customers."

Attractive staff location

50% of open job positions at Amazon are filled by internal transfers, and the rest with local and international hires. "Luxembourg has a very strong professional services market so we find great candidates here, but we are also open to international talents," says Ms Husser. "People from abroad enjoy the quality of life and security in Luxembourg and the country's central location in Europe. We fund courses in Luxembourgish and English to assist employees who need to improve their language skills." The company also offers school fee subsidies and coaching for spouses looking for a job.

Tadaweb also puts a lot of emphasis on its recruitment and onboarding process. "We love to hire locally in the Benelux region, and interact with universities to spot interesting people. However, for some roles such as designers, developers and customer development specialists, we also have to go global," Ms Elvin explains. "We provide extensive practical support to help people settle and make them happy here, and as we are in full expansion, our challenge is to scale our personalised approach as we recruit batches of people."

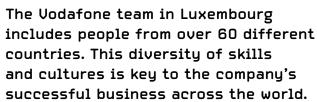
Getting top talent to Luxembourg is, according to her, not an issue. "Expats love the family setting in Luxembourg, the easy use of English and the good pubs in the city! We recently had a COO post open and received 3,000 applications from all over the world. People are excited about coming here."

Text: Lena Mårtensson
Photos: Laurent Antonelli, Michel Zavagno





A global team for global business



Luxembourg-based Vodafone Procurement Company (VPC) was founded in 2008 and manages most of the communications technology company's spending with suppliers worldwide. Luxembourg also hosts Vodafone Roaming Services and the technology scale-up accelerator Tomorrow Street. Together, the three entities employ over 400 people from all over the world. "Only the United Nations can compete with us!" jokes Global SCM Networks Procurement Director Tolga Tomruk.

VPC manages a spend of over €25 billion and deals on a daily basis with over 20 Vodafone markets as well as with external customers and third parties, which extends the geographic reach further. "Building this entity here has been a success for Vodafone," confirms Mr Tomruk. "The cultural diversity of our team means that we can speak nearly every language that we interact with and understand how business is made in each specific region and country."

Most new hires come to Luxembourg from abroad. "Everyone who comes here brings a network with them of potential clients or partners," says Kenneth Graham, CEO of Tomorrow Street. "Wherever we do business around the world, someone will know someone. That is really helpful."



I don't feel like a foreigner here. This is our country – and that makes a big difference.

Sourcing talent

VPC attracts a lot of young graduates to Luxembourg. "This is easy: we offer them a job in an exciting company located in a very nice and dynamic environment," says Mr Tomruk. "Moving experienced people who come with their families here can at times be more challenging. We have to act as ambassadors and explain what it is like to live and work in Luxembourg. However, people soon see the benefits of letting their children grow up in a multicultural environment, and Luxembourg's investment in international schools over the past few years is much appreciated."

In order to connect further with home-grown talent,
Mr Tomruk has joined the advisory group of the
Luxembourg Centre for Logistics and Supply Chain
Management at the University of Luxembourg.
"We were invited to help shape the curriculum and
the priorities to be taught, and have committed to
interviewing all its graduates to see who can fit in our
organisation. They are exactly trained to what we need."

Tomorrow Street, a joint venture between Vodafone and Luxembourg's technology incubator Technoport, is another means for finding talent and innovation. "Our purpose is to identify exciting scale-ups that fit Vodafone's technology needs, and host them in our innovation centre where we work together to help them scale their technology solutions across Vodafone," says Mr Graham. "They come here to kick start and grow their business with Vodafone, and are attracted by the connectivity Luxembourg offers with a thriving start-up

ecosystem, global companies and a supportive government." So far, Tomorrow Street has attracted 8 scale-ups to Luxembourg and is about to sign partnerships with two more. "They come from the Middle East, the UK, the US and Canada and we provide them with the base they need to grow across Europe."

Opportunities for growth

Mr Graham sees great potential for growth in Luxembourg. "The Luxembourg ecosystem is super ambitious and focused on exciting new technologies," he underlines.

Being here is also an opportunity for personal growth.

"Mixing with so many cultures, languages and experiences allow us to learn something new every day," says Mr Graham.

Mr Tomruk, who moved eight times internationally, points out that wherever you come from, you can find a community in Luxembourg. "Contrary to all the other countries where I have lived, I don't feel like a foreigner here. This is our country - and that makes a big difference."

Text: Lena Mårtensson Photo: Michel Zavagno





They chose Luxembourg

Discover four highly skilled professionals who have decided to pursue their careers in Luxembourg.

Name: Poondi Rajesh Gavara Country of origin: India **Profession:** R&D manager

"I came to Luxembourg for professional reasons in 2017. I worked as an R&D manager in the biotechnology department at Amer-Sil. Working here has been a great experience. I have made good friends from different nationalities and learnt about their cultures and work styles. It is a safe, clean and beautiful country that has allowed me to establish strong business and network opportunities.

I have found Luxembourg to be a very welcoming country. The locals are friendly and open, English is widely spoken and the public transportation is free. It is a dynamic, open environment offering great business opportunities. I would definitely recommend coming to Luxembourg as an expat, because it is dynamic, diverse, open and offers a unique international environment for highly skilled professionals."

Name: Noha Bayoumi Country of origin: Egypt **Profession:** Business analyst

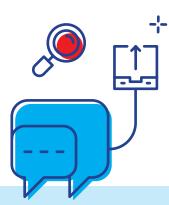
"My husband and I both specialise in IT, and after coming here seven years ago we have found plenty of opportunities in our field. We find Luxembourg a very convenient place for both living and working. The diversity of languages is great: we work in English and French, and sometimes even in Arabic. It is funny that we meet so many cultures here. My kids are speaking five languages, which is very nice.

The work-life balance in Luxembourg is excellent – it is easy to finish work, disconnect and start with something else, and to keep a family life. It is easy to adapt here, which is something that we appreciate a lot. In addition to the dynamic IT sector, we have seen the multitude of opportunities in finance, so now we are inviting our friends with a finance background to come and join us here!"













Name: Alexandros Paschos

Country of origin: Belgium/Greece

Profession: Project manager/Technical lead

"After finishing my studies in computer engineering and satellite communications, I felt that I could provide an added value to Europe's development in space communications. I came to Luxembourg four years ago because of the presence of SES, one of the world's leading satellite operators. The country is very well positioned in the space industry with other leading companies such as iSpace and Spire, and also in the healthtech field with innovative, cutting-edge companies like Biomind and B Medical Systems.

Although small in size, Luxembourg is a truly cosmopolitan country. Connecting with colleagues with different cultural and linguistic background has helped me to continue developing my social skills. It also has among the best working and living conditions in Europe. And I really enjoy the wine route along the Moselle!"

e route along the Moselle!"

Name: Eve Mérinville Country of origin: France

Profession: Director of innovation and research

"Back in 2015, I was approached for a job opportunity here. I had never considered Luxembourg as a potential location to pursue my international career, but was happy to look for a new challenge and settle in a new home. It has been five years now, and I have not regretted it since.

My two children were born here, so I have experienced the standard of healthcare and realised what a great family location Luxembourg is. From a work perspective, I have created new connections and networks. I was not only able to tap into the Luxembourg experience and expertise, but also into that of neighbouring countries like Belgium and France.

This country has a lot to offer. The obvious word that comes to mind is 'unique' with the rich, multicultural lives we can have here. Luxembourg is going through a fast-pace period of development, and it is fantastic to be part of the experience."

Text: Lena Mårtensson

Photos: Laurent Antonelli

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Luxembourg in figures _



- ~ 635,000 inhabitants
- +180 nationalities

53% Luxembourgers

38% EU residents

9% Non-EU residents

(Sources: STATEC, EUROSTAT)

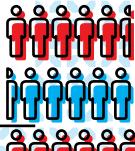
International workforce

27% Luxembourgish residents

27% foreign residents

46% cross-border workers

(Source: STATEC)





#1 in the world for highly skilled employment

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(Source: STATEC)

#3 in the 2020 World Talent Ranking

(Source: IMD)

2nd highest labour productivity in the world at basic prices

(Source: 2019 The Conference Board Productivity Brief)

#1 in the EU for average number of languages spoken: 3.6

(Source: Eurobarometer)

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Text: Lena Mårtensson
Illustrations: Quattro Creative

















Luxembourg is home to the one of only two copper foil manufacturers in Europe. With a strong focus on R&D, the company plays a leading role in developing next generation copper foil for applications of the future.

Your smartphone and bank card might well be functioning thanks to high-quality electrodeposited copper foil produced in the town of Wiltz, located in the picturesque hilly Luxembourgish Ardennes. "We have a strong focus on high-end products," explains Circuit Foil CEO Fabienne Bozet. "Circuit Foil produces 2% of the copper foil available on the world market, but 12% of high valueadded products. Our sister factory in Hungary – the only other producer in Europe, which is also owned by our South Korean shareholder SkyLake Investment – uses our technology to produce foil for electric vehicle batteries."

Circuit Foil's products are also used in items such as hearing aids and pacemakers. Another important field is products adapted to ultra-fast transmission of massive amounts of data through 5G. "The high speed and security of data transmission are crucial for applications like autonomous driving or artificial intelligence-based medical imaging analysis and diagnostics. The development of products enabling such transmission without information or signal loss is a priority of our R&D department."

Research partnership for next generation copper foil

Most R&D is done in-house by a multicultural team of 18 people. However, in order to push the frontiers even further. Circuit Foil has recently launched a massive three-year research partnership with the Luxembourg Institute of Science and Technology (LIST) aimed at copper foil production for markets driven by digitalisation and electrification technologies. The Ministry of the Economy, the National Research Fund and the Ministry of Higher Education and Research are financially supporting the joint initiative.

A first field of collaboration is copper materials for electronics and emerging applications. "Although 5G is not yet fully deployed, we are already working on materials for the future 6G network," explains R&D Director Michel Streel. "Our plan is to produce ultra-thin copper foil with extremely low loss of electronic signal." The €18 million partnership also covers work on materials for energy and transport as well as advanced materials.





The historical importance of Luxembourg is mirrored in its over 50 castles, most of which date back to the Middle Ages. Nestled on forest-covered hills or taking pride of place in picturesque villages, a number of them have been restored to their former beauty.

Visit Vianden castle that has been listed by CNN as one of the 21 most beautiful castles in the world, explore the Brandenburg castle ruin dating back to the 10th century or enjoy a dinner within the 12th century walls of Bourglinster castle. Clervaux castle hosts a World War II museum, a collection of models of Luxembourg's fortified castles and the famous documentary art photography exhibition "Family of Man." The Grand Ducal Palace in Luxembourg City also opens its doors to visitors during the summer months. If one visit is not enough, explore a thousand years of Luxembourg's history in one go by following the 37 km national hiking trail "Valley of the 7 castles".











Text: Lena Mårtensson















A fantastic place to live

John Parkhouse

CEO of PwC Luxembourg From England Living in Luxembourg since 1994

Head of PwC Luxembourg, which is the largest professional services firm in Luxembourg with over 2,900 people employed from 82 different countries, John Parkhouse arrived in Luxembourg in the 1990s. "I came here for two years and like many others, ended up never leaving," he explains.

Over 25 ago, Luxembourg was on the cusp of an economic transformation process. "Since that time, we have seen Luxembourg propel into a very modern and dynamic country. It has evolved into a fantastic place to live, work and raise a family."

Today, the economy is thriving. "There is huge growth and dynamism in areas such as healthcare, digital, fintech and smart factories as well as the space sector. A great number of companies have come to Luxembourg with the view to expanding their operations into space."

According to Mr Parkhouse, the country is full of assets. "Nobody grows up dreaming of coming to and living in Luxembourg. But when you experience it, it is an amazing place to live, work and raise a family. Dynamic, energetic, very young, but most of all multicultural.

Luxembourg is a country which really welcomes foreigners."

















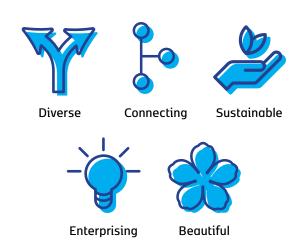


Meet us at Expo 2020 Dubai

Luxembourg is present at Expo 2020 Dubai with a pavilion centred around the theme "Resourceful Luxembourg". Until 31 March 2022, visitors can discover the openness and dynamism of the country. Companies can also connect with the Luxembourg business community through the economic programme organised by the Chamber of Commerce in conjunction with the World Expo.

173 days to show the world how Luxembourg has continuously succeeded in reinventing itself and how it has benefitted its partners: this is the ambitious objective of the Grand Duchy's presence at Expo 2020 Dubai. The country is there to showcase its economy, culture and tourism assets.

Five key aspects of Luxembourg are highlighted in the uniquely designed pavilion that promises visitors an unforgettable experience.



Contact our international network



The international network of Luxembourg Trade & Invest is fully committed to assisting you with the expansion of your business to Luxembourg and your entrance into the European markets.

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Economic advisors and trade attachés

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Find more information about the support available for international companies considering coming to Luxembourg and about our diplomatic network at tradeandinvest.lu/how-we-help

Luxembourg economic programme

A central part of Luxembourg's participation at the World Expo is an economic programme organised by the Luxembourg Chamber of Commerce. The programme facilitates Luxembourg-based companies' access to international markets. It also highlights what Luxembourg has to offer to international companies looking for a new base in Europe. The economic programme started in 2021 with trade missions focused on ICT and space as well as a "Made in Luxembourg" Week. These events will be followed by a range of initiatives during the first quarter of 2022.

Sustainability mission – 17-23 January 2022 Trade mission organised in the context of Abu Dhabi Sustainability Week.

Luxembourg Day – 23 January 2022 Featuring Luxembourg artistic performances and more at the iconic Al Wasl Plaza. Matchmaking Event – 22-26 January 2022

B2B meetings helping Luxembourg and European SMEs find international business partners.

Healthtech mission – 22-27 January 2022

Trade mission organised in the context of the Arab Health fair.

Food & beverages mission – 13-17 February 2022

Trade mission organised in the context of the GulFood fair.

cc2020.lu

Text: Lena Mårtensson Illustrations: Quattro Creative































Loic Bertoli

LTIO Adu Dhabi

The first local point of entry

LTIO Abu Dhabi plays a key role as local coordinator and business contact during Luxembourg's participation at Expo 2020 Dubai. Executive Director Loïc Bertoli speaks about Expo ambitions and business benefits.

"During the Expo, we will work with all our trade missions and delegations. Afterwards, our priority will be to support UAE companies that want to know more about Luxembourg as a business destination, and to help Luxembourg companies follow up contacts and potential partnerships initiated.

We are the first point of entry for companies that want to explore Luxembourg as a potential European location. We can provide information and support that is well adapted to the local context here, and connect companies with the right organisations that can assist them with setting up a business in Luxembourg. Our objective is always to build long-term relationships. Often, they come to realise that they have an easier access to the European market via Luxembourg than via other EU countries."

What surprises people in the UAE when you talk about Luxembourg?

"My Emirati colleagues and friends love to hear about how lush and green Luxembourg is! They are also impressed by the diverse choice of restaurants and the number of establishments awarded Michelin stars. My international friends are amazed to discover that Luxembourg produces excellent white and sparkling wine."

Impressum



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