

FINTECH

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WHY FINTECH IS CHOOSING LUXEMBOURG

01



Access to the European Single Market

- › The perfect hub to access the EU Single Market via the European passport
- › Access to a large, highly skilled and multilingual talent pool



Innovation-friendly regulation

- › Pragmatic but strict regulators, with an open attitude towards innovation
- › All relevant legal texts and filings for financial services companies are available in English
- › Fintech companies already covered by existing financial services regulation
- › Regulated Fintech companies can benefit from the EU passport
- › Cloud-friendly legislation
- › Pioneering legal framework for electronic archiving



R&D Expertise

- › Collaborative projects with the University of Luxembourg's Interdisciplinary Centre for Security, Reliability and Trust (SnT) and the Luxembourg Institute of Science and Technology (LIST)

AAA

Stability

- › Luxembourg is a politically stable, AAA-rated country, with very low public sector debt and an economy that has performed strongly over many years. Economic growth in Luxembourg is consistently above the EU average



Access to a leading international financial centre

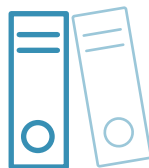
Luxembourg is the largest fund centre in Europe, and second only to the US globally, a leading wealth management, banking and EU payments hub, offering:

- › An ecosystem focused on cross-border financial services and products
- › A large potential client pool, ranging from the investment fund industry and banks to wealth management and insurance companies
- › Banks open to onboarding Fintech companies
- › Collaboration with the financial industry through the Luxembourg House of Financial Technology
- › Easy access to financial industry decision makers



Cutting-edge data infrastructure

- › Highest density of TIER 4 data centres in Europe
- › 28 ultra-low latency fibre routes connecting Luxembourg with major European cities



Access to support and funding

- › Multiple sources of public and private funding, including innovation and R&D grants
- › Diverse private and public support initiatives, including a dedicated national Fintech platform, the LHoFT (Luxembourg House of Financial Technology), offering incubation and co-working opportunities
- › Wide variety of conferences, awards and networking opportunities, and several start-up acceleration programmes

FACTS & FIGURES

02



Strong European Innovator ¹



Best ICT infrastructure worldwide ³



Major European **banking and wealth management** centre



First country worldwide for **attracting talent** ³



A **leading EU insurance** centre



2nd best digital legal framework worldwide, after the US ⁴

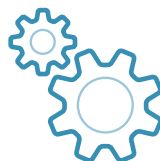


The world's **largest cross-border fund distribution** platform



Safest country in the EU ⁵

1st in the world in terms of **ICT skills** ²



Venture capital hub.
1st worldwide for venture capital investors deals/bn PPP\$ GDP ⁶

¹ European Innovation Scoreboard 2021

² Networked Readiness Survey 2021

³ Insead global talent competitiveness index 2021

⁴ WEF Global Competitiveness report 2020

⁵ Legatum prosperity index 2021

⁶ Insead Global Innovation index 2021

FINTECH'S GROWING ROLE IN LUXEMBOURG

03

FINTECH'S GROWING ROLE IN LUXEMBOURG

"Post Brexit, Luxembourg is the hub for serious Fintechs in the EU."

Anders de la Cour,
CEO, Banking Circle

The financial services industry is in the midst of transformation. Changing customer preferences, increased regulation since the financial crisis, as well as a growing focus on sustainability, digitalisation and globalisation are all drivers of this paradigm shift. Technology is a key facilitator in all of these transformations.

Financial technology, or Fintech, is reshaping the fundamentals of business models and shifting power from institutions to clients, in a process some have termed Amazonisation.⁶ The impact of the COVID-19 pandemic will also have a lasting impact on digitalisation. As life normalises, much of the technological tools designed to combat the virus will continue to be used. Fintech and new technologies will play a major role both in reviving the world economy and enhancing its resilience to future crises. The financial services of tomorrow will look vastly different from those of today. They will be faster, more efficient, more secure, more global, platform-based and data driven.

With its long history of financial innovation, Luxembourg is set to be at the epicentre of this digital revolution.

The international Eurobond market was born in the Grand Duchy in the 1960s, while in the 1980s, Luxembourg became a leading location for international cross-border investment funds – both examples illustrate Luxembourg's capacity for leading change.

Financial technology innovation in Luxembourg has accelerated rapidly since the turn of the millennium, both among incumbent players harnessing new technology to generate new efficiencies and revenues, as well as through new entrants expanding Luxembourg's financial centre into new service sectors. One good example is Luxembourg's emergence as a centre for international cross-border payments since the turn of the millenium, with Paypal obtaining a banking license in the Grand Duchy in 2007. Since then, many other leading payments firms have chosen Luxembourg to be their EU hub. Building on these developments, the European Payments Association has chosen Luxembourg as their EU base in Luxembourg to support the local and international payments sector.

⁶ LFF & PWC, Amazonisation is the Future of Financial Services, 2019

Luxembourg's approach to Fintech builds on this history, as well as on the strengths of its financial ecosystem. Luxembourg aims to provide the tools which all financial institutions need to ensure they stay competitive and so maintain the country's status as a global leader going forward. These tech solutions can be provided by established firms or start-ups, based in Luxembourg or abroad.

Regulatory expertise, risk management and compliance are key strengths of Luxembourg's financial services industry. A significant number of Fintech companies in Luxembourg focus on serving the regulatory and compliance needs of global finance: ranging from KYC and fraud detection, data management, to fund reporting and investor information tools, as well as digital investment services and online platform provision for financial services. This is complemented by an array of Fintechs, many in the B2B space covering other sectors, such as asset management, tokenisation and capital markets technology, InsurTech and more.

Luxembourg's support ecosystem for Fintechs is deep and diverse. The Luxembourg House of Fintech (LHoFT) is a public-private partnership, which brings together financial institutions, Fintech innovators, research and academia,

as well as public sector authorities to help drive forward innovation and the development of solutions to meet specific industry needs. It acts moreover as a soft-landing platform for Fintech companies from abroad wanting to access the local financial sector and market their solutions across the EU.

Besides the LHoFT, Luxembourg is home to a number of incubators and accelerators, which help to ensure that the country stays at the vanguard of the latest technology developments in the field. Through its research, the University plays an active part in the ecosystem and undertakes demand-driven, applied research projects, together with the financial industry through the university's interdisciplinary centre for security, reliability and trust (the SnT), producing genuine, long-lasting competitive advantages for companies with a presence in Luxembourg.

Innovation also requires funding and access to capital. Luxembourg provides a range of government-backed funding programmes, such as the Luxembourg Future Fund or the Digital Tech Fund. Private funding needs to be ensured as well – and this is where the PE & VC community play a large role.

LUXEMBOURG'S FINANCIAL CENTRE...

Having developed a diversified international financial ecosystem over the past half-century and more, Luxembourg has unrivalled expertise in cross-border financial services and products. As a recognised EU hub for banks, asset managers, insurance and financial technology companies, Luxembourg is today the home of the global fund industry and boasts one of Europe's core capital market infrastructures. The financial centre is also a standard setter in sustainable finance as well as in international Renminbi business.

Luxembourg is the ideal gateway to the European Single Market. Its unique position allows the country to connect international investors with Europe, and European investors with the rest

of the world. As a result, the majority of the world's leading asset managers have chosen to set up their global fund ranges in the Grand Duchy, while leading private equity houses structure their investments via Luxembourg.

Supranational, government and corporate issuers from all over the world choose to list their securities in Luxembourg, while international banking and insurance groups serve their European customers from their Luxembourg competence centres, leveraging their EU financial services passport (see section on regulation below).

With an established reputation for legal certainty, financial security and data protection, Luxembourg's financial centre is trusted worldwide.

...AND HOW IT BENEFITS FINTECH COMPANIES

The presence of a leading international financial centre has three major benefits for Fintech companies:

- › A large potential client base for Fintech companies and their products, with around 3,500 investment funds - with over € 5.6 tn under management - over 120 international banks and nearly 300 insurance and reinsurance companies. The particularly networked nature of Luxembourg's financial centre means that access to key decision makers in these institutions is also much easier than in most other markets.
- › Fintech companies have access to regulators who are innovation friendly, responsive, and multilingual (including English, French and German). These regulators are also unmatched when it comes to their long-standing experience in authorising and regulating financial institutions, offering their products and services on a cross-border basis throughout the EU.
- › In order to develop and commercialise their activities in Europe, Fintech companies can leverage a financial centre ecosystem that is both multilingual and specialised in international and pan-European business, ranging from fund administrators and custodians to wealth managers, bankers and insurers, and from law firms and consultants to tax advisers.

Thanks to a highly developed financial services ecosystem and a tech-friendly regulatory and legal environment, Fintech companies find in Luxembourg an excellent environment to develop, test and commercialise EU-wide and global solutions.

MAIN ACTIVITIES

04

MAIN ACTIVITIES

FINTECH – AN INTEGRAL PILLAR OF THE LUXEMBOURG FINANCIAL CENTRE

Fintech activities in Luxembourg have developed as a natural response to the needs of the main business lines of Luxembourg's international financial centre. As a result, many Fintechs in Luxembourg are active in the B2B or B2B2C space, serving the financial centre's

core competencies or working directly with financial institutions to develop internal solutions. This allows them to develop, test, market and distribute their products and services first on a national basis, before marketing them across Europe and then worldwide.

"We have been present in Luxembourg for over 30 years and have in excess of 1,100 employees in the Grand Duchy. We see Fintech as a key way of deepening relationships with our clients, with digital offerings increasingly becoming a key differentiator. In Luxembourg, we have labs working in particular on data management, data visualisation, and process automation. We also closely follow the Fintech ecosystem here for products we can integrate into our systems. By bringing our experience and understanding of the local market and funds industry together with our digital know-how, we deliver new tools to help our clients meet their daily challenges."

Philippe Renard,
CEO RBC I&TS



Compiled with the support of LFF, ALFI, ACA and ABBL

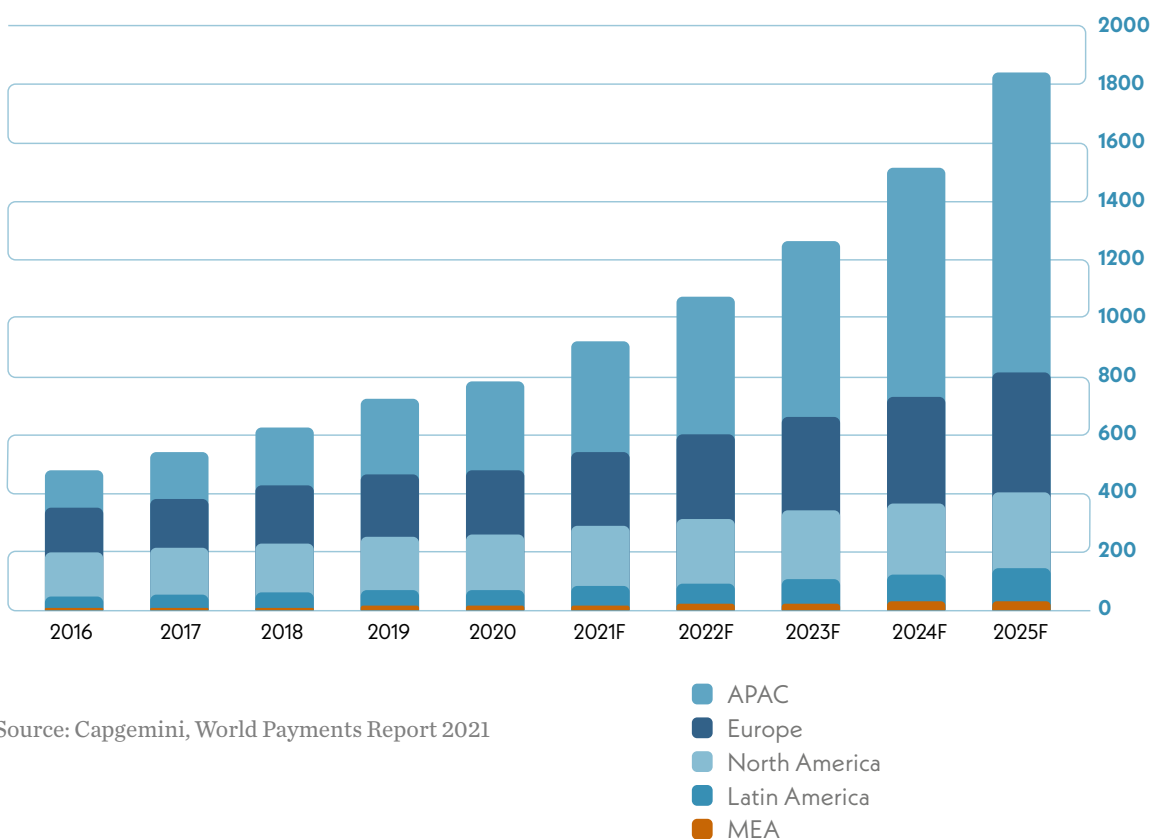
©The LHoFT Foundation

PAYMENTS AND E-COMMERCE

The rise of the internet in the 1990s fundamentally reshaped the global landscape for financial transactions and led to the growth of digital platforms selling products and services which have since become household names. These platforms, and e-commerce in general, generated a need to deliver online-capable payments channels. The parallel expansion of global supply chains at the same time boosted demand for online trade finance and foreign exchange services.

Online payments have been a key catalyst for change, but offline and mobile payment technologies have also seen significant developments. Changing generational preferences, coupled with new innovations, such as contactless point-of-sale payments and e-money, are leading the growth in non-cash modes of payment and, in even more advanced markets, the march towards a completely “cashless” society.

Number of worldwide non-cash transactions (in billions) by region



In Europe, the adoption of the Euro and the Single European Payments Area (SEPA) has accelerated the evolution of the payments industry even further. The EU's Payment Services Directive II (2015) increased pan-European competition in the sector and its further integration. The legislation also significantly enhanced consumer rights and safety.

Many of the new opportunities in the sector have been exploited by non-banks or non-traditional players, and there is a marked trend among players, for whom payments is an adjacent business, to enter this space with new and innovative offerings. E-commerce companies and other large online platforms have been particularly prominent in these developments.

While the obvious drive has been in B2C services, we are also witnessing a rapidly developing B2B payments environment, capitalising on technological advances to reshape inter-institutional payment flows. The establishment of online

marketplaces, for example, has facilitated the development of a payment-acquiring industry, where specialised actors collect and process transactions from online platforms on behalf of merchants, often across multiple geographies and jurisdictions. Increasing volumes of cross-border payment flows have likewise spurred the development of FX services to facilitate such transactions.

Leading international players in the payments sector have chosen Luxembourg as their hub to serve this fast-growing EU payments market. In Luxembourg they can leverage a regulatory framework of payment licenses to passport their services across the EU (Payment Institution and E-Money Institution licenses), the country's supportive Fintech ecosystem, as well as its state-of-the-art IT infrastructure. This has led to the Payments Association (EPA) choosing Luxembourg as the HQ for their EU representation office in March 2020. The EPA is a leading professional association of the international payments sector.

"Luxembourg is a strategically important hub for PayPal's European operations – we are registered as a bank here, enabling us to provide PayPal services seamlessly across the European Union under single market banking regulations."

Joachim Goyvaerts,
director at PayPal Benelux & Ireland

PAYPAL

Since its creation in Palo Alto in 1998, PayPal has facilitated access to money and provided multiple, safe and seamless payment methods.

REGTECH

Global regulation has been fundamentally reformed in the wake of the global financial crisis of 2008-2009, with increased transparency and stability being the new watchwords. This has resulted in a significant increase in supervisory oversight, as well as a substantial growth in terms of the internal monitoring required of a financial institution.

A recent study showed firms are spending around 4% of revenues on regulatory compliance, while banks paid USD 320 billion in fines over the 2007-2016 period.⁷

In the digital age, there is an increasing focus on user experience. Customers increasingly expect opening a bank account or accessing other financial services to be as easy as signing up for any other online service, just like music streaming or setting up a social media account. The challenge for regulated financial institutions is maintaining a positive customer experience while maintaining high standards of compliance and satisfying KYC and AML requirements.

New technologies can be harnessed to meet both the challenge of more efficient control and oversight as well as better customer experience. Regulatory technology, or RegTech, is not a single

technological innovation per se, but involves the use of multiple new and emergent technologies covering a wide range of business and operational processes – all with the goal of ensuring that regulatory and compliance tasks are cost-efficient, effective and carried out in a way that creates a positive user experience. This is especially important as financial services become more international.

Regulatory expertise, risk management and compliance are key strengths of Luxembourg's financial services industry. Unsurprisingly, a significant number of Fintech companies in Luxembourg are now focused on serving the regulatory and compliance needs of global finance.

Solutions developed in Luxembourg are assisting asset managers gain oversight and transparency of their global governance network and processes, giving them a clear competitive advantage. Other companies based in the Grand Duchy are developing digital onboarding services for financial institutions.

Other Luxembourgish solutions are using advanced big data technology for compliance, counterparty risk management, fraud detection and competitive intelligence.

“Luxembourg is a great base for a RegTech like us. The financial industry here provides us not only with a direct client base for our services, but also with easy access routes to the headquarters of financial institutions all over the world. Moreover, the expertise on regulatory topics present in the ecosystem in Luxembourg is a great source of talent. That’s why we are proud to open our new House of Governance, a place where our teams and clients can collaborate on innovation projects and discover the benefits of digital governance.”

Bert Boerman,
CEO Governance.com

⁷ Cambridge Centre for Alternative Finance, Global RegTech Industry Benchmark Report, 2019

BIG DATA AND AI

Cloud computing, faster data processing and enhanced global mobile connectivity has seen a rekindling of interest in the field of artificial intelligence (AI). The large datasets that are required to train AI models are more accessible than ever before, while the potential useful applications of AI in financial services are enormous.

Luxembourg's role as a major global fund centre provides fertile ground for the development of AI projects. Traditionally, funds in Luxembourg have had to manually check their fund prospectuses to ensure accuracy and

regulatory compliance. Now, as a result of developments in the field of Natural Language Processing, a number of companies are providing automated solutions for such tasks.

Similarly, the international and cross-border nature of the Luxembourg financial centre means there is a need for documentation in a wide variety of languages. As AI has improved, automated specialist financial services translation is increasingly available in Luxembourg.

"Our choice to be in Luxembourg was a no-brainer. It provides us with access to a vibrant, international ecosystem characterised by optimism, where you're never more than one phone call away from the headquarters of major financial institutions. Being based in Luxembourg also allows us to draw from a talent pool across the greater region that includes some of the best universities for computer science in Europe."

Christian Gillot,
CEO and Founder, Tetrao

TETRAO

Tetrao is a technology start-up company specialized in Internet intelligent process automation. It provides specialized AI services that make use of Machine Vision and Machine Learning algorithms to provide services covering a wide range of use cases such as lead generation, lead qualification, market study, business intelligence, social media, data checking, data consolidation, information system integration, back office processes and many more.

DISTRIBUTED LEDGER TECHNOLOGY, TOKENISATION AND CRYPTO

Outside of the field of natural language processing, the data generated and processed by the Luxembourg financial industry is a rich source for tools reliant on the discovery of patterns in large datasets. AI in this field presents significant opportunities for the Luxembourg financial sector, both in

terms of using data analytics to inform business strategy and to make use of trend identification in fields such as KYC or suspicious transaction monitoring. Several companies in Luxembourg are also making use of artificial intelligence to leverage alternative datasets as a basis for proprietary investment strategies.

Understanding how Distributed Ledger Technology (DLT) can be applied to financial services has come a long way since Satoshi Nakamoto made the first Bitcoin transfer in January 2009. We can currently divide use cases into three broad categories, specifically cryptocurrency developments, tokenisation processes and use of blockchain to improve other business processes.

Firstly, there is the ongoing development of cryptocurrencies and the use of blockchain or DLT-based systems as a foundational architecture for a virtual means of exchange. From the halcyon days of Bitcoin being the sole exemplar, we now live in a world where there are thousands of cryptocurrencies are traded. In December 2021, Coinmarketcap listed 15,548 cryptocurrencies, with a total market capitalisation of USD 2.2 tn.

Stablecoins, both in the form of Facebook's ongoing Novi initiative and other providers such as Tether and DAI are also adding a new impetus to the potential global impact of cryptocurrencies, creating digital assets that are tied to a pegged value in a given fiat currency or a basket of such currencies.

Governments and central banks are also considering the potential of distributed ledger technology to create a Central Bank Digital Currency, with experiments now taking place in a number of major geographies including China and Europe.

The fiat-to-crypto exchange processes of major crypto exchanges are regulated in Luxembourg under payment services legislation. Luxembourg is also home to a number of developments in the field of "crypto compliance", including solutions covering AML software for cryptocurrency onboarding.

Secondly, another emerging use case for distributed ledger technology is the introduction of liquidity into secondary market trading in assets that were previously impossible to trade or highly illiquid. In such cases, coins on a given blockchain network are used as tokens representing an underlying “real” asset.

Potential underlying assets for such tokenisation are wide ranging and include traditional financial assets, such as securities or other financial instruments, as well as tangible goods, such as real estate, fine art, or even forestry assets. Luxembourg’s strong history in the development of international capital markets is also reflected in the vibrant ecosystem of companies developing such tokenisation services.

“Luxembourg has been an extremely fertile ground for us to develop our services. The legislation around tokenisation is very forward thinking, and the Fintech community here is super innovative.”

Luc Falempin,
CEO Tokeny

TOKENY

Tokeny provides solutions enabling firms to leverage tokenisation technology, allowing for fast onboarding, cost-efficient management and rapid transferability of private market securities.

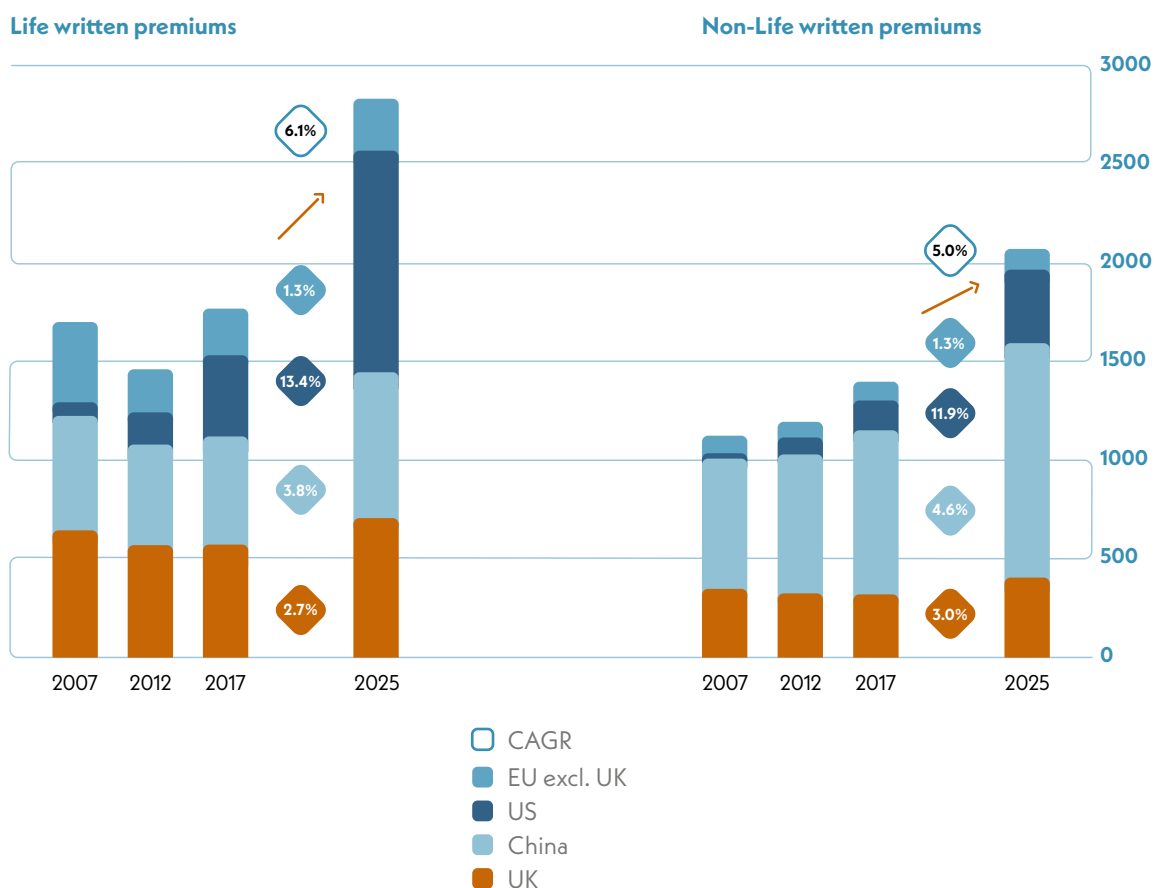
Finally, DLT also has applications to support the business processes of one or more organisations, using the technology as a foundation stone of their infrastructure. Data transfer within organisations is a good example here. DLT ensures the transfer is both transparent as well as secure.

In Luxembourg, consortia are working on using DLT to support investment fund transaction processing between Transfer Agents, payments systems and investors, while other groups are exploring the potential to mutualise KYC checks through the use of joint DLT platforms. There are also key blockchain developments taking place in the public and non-profit sector. Infrachain for example is on a mission to create a community-driven governance model to accelerate adoption of Blockchain technology, while the Luxembourg government has announced that work is underway on the world’s first public sector blockchain system.

INSURTECH

The European insurance industry has undergone a period of slow growth and rising compliance costs over the last decade – with an expected compound annual growth rate of written premiums on the life insurance side of 2.7% and non-life of 3.0% up to 2025.⁸

Global Insurance Life & Non-Life GWPs, US\$ billion



Source: PwC Market Research Centre analysis. Past data based on Insurance Europe, Swiss Re and Munich Re.

Technology is becoming increasingly vital to enhancing operational efficiency, reducing risk and unlocking new revenue streams. Insurance companies also need to embrace the opportunities created by technological change to improve their products and services.

The rise of usage-based insurance is a good example. This trend has been enabled by telematics, cloud computing, and the Internet of Things. Ownership of internet-enabled devices is estimated to grow at a

compound growth rate of 7% from 2015 up to 2025, when there is forecast to be over 50 billion such devices in use.⁹ This presents an opportunity for insurance companies to provide more accurate risk profiling based on usage telemetry. In the property and casualty space for example, car insurance providers can quantify actual vehicle usage to assess a customer's risk profile, rather than relying as before on indirect indicators such as age, gender, address or creditworthiness.

⁸ LFF & PWC, Amazonisation is the Future of Financial Services, 2019

⁹ McKinsey, Digital ecosystems for insurers: Opportunities through the Internet of Things, 2019

On the other hand, as the world becomes ever more reliant on web-based services, cyber-insurance is becoming increasingly pivotal. Insurers that can effectively price the risk of such insurance will have a brand-new revenue line.

Many global insurers have their EU hubs in Luxembourg and are using technology to disrupt the traditional insurance business. InsurTech firms in Luxembourg offer ultra-customized policies, social insurance, and use new data streams from internet-enabled devices to dynamically price premiums according to observed patterns of behaviour.

MICROFINANCE MEETS FINTECH

Building on Luxembourg's long history in microfinance, there are a range of Luxembourg startups developing solutions to service the under or unbanked around the world.

In the microinsurance space, Luxembourg's position as the home of a major European satellite firm has encouraged one local insurtech to use satellite Earth Observation data in combination with blockchain technology to provide a decentralised, mutuality-based insurance product for smallholder farmers.

There are also companies working to make access to financial services and cross-border FX transfers in developing markets more affordable, building on Luxembourg's strengths as a payments hub.

The Luxembourg House of Fintech (The LHoFT) also runs an annual programme entitled CATAPULT: Inclusion Africa, which targets companies focused on financial inclusion in Africa. The project aims to build bridges between Africa and Europe, and is closely aligned with the sustainability goals of Luxembourg's financial centre. The InFiNe.lu Inclusive Finance Network also provides the framework and funding for an annual "European Microfinance Award", with a € 100,000 award to the best inclusive finance solutions, which often have a large technology component.¹⁰

FUNDTECH

Asset Management is an industry undergoing a radical transformation. Rising compliance costs, coupled with reductions in margin and management fees mean that many asset managers need to rethink their operating models. The 2008 financial crisis has led to increased focus on transparency and investor protection, priorities underscored in the EU's MIFID II legislation.

Technology offers the investment fund industry both solutions and new challenges. In the retail fund sector, the

availability of data and indices has led to strong growth in passive investment strategies and index-tracking exchange traded funds (ETFs). Managers are facing extreme fee pressure as competition heats up in Europe, with some players in the industry slashing fees to zero or introducing ETF platforms with zero transaction charges. Active managers face additional pressures to justify their higher fees when their performance is at best no different (or often worse than) passive approaches.

¹⁰ <http://www.catapult.lu/>

One likely consequence of these trends for mass market funds is the leveraging of technology to achieve automation and scale. Robo-advisory and other automated investment advice technologies have attracted significant attention, but equally important will be a shift in the way in which funds are distributed, with possibly a more “direct-to-consumer model” in contrast to the current intermediation model.

We should, however, also note that there are interesting opportunities for niche services providing specialised and bespoke FundTech products to specific groups of individuals with more precise needs. Here, expert insight into specific products or the needs of certain client segments may prove a decisive advantage.

“Fintech allows you to “mass customise” investment management, thereby opening the benefits of investment to individuals that would previously not have had recourse to professional support in this domain. When setting up our company, we chose to base ourselves in Luxembourg because it's the ideal location if you want an EU-wide footprint, providing both a great talent pool that is very international, as well as a skilled ecosystem of service providers. Luxembourg's regulator is also highly experienced in supervising cross-border financial services and open to innovation.”

Gaëlle Haag,
CEO and Co-founder, Startalers

STARTALERS

Startalers provides investment management solutions tailored towards women who want to invest sustainably, providing them with tools to help them make the best decisions for their financial future, and advice on how to obtain their objectives by investing in accordance with their values.

On the institutional asset management side, persistently low interest rates have spurred growth in alternative investment funds. Here too, technology may prove to be a way of unlocking new value streams, either through new asset classes (unlocked through tokenisation) or new data-driven investment approaches.

For the asset management industry as a whole, technology also presents an opportunity in terms of cost efficiency. Implementing solutions automating customer onboarding, KYC checks, prospectus production and a wide variety of other operational processes is

one important way for asset managers to ensure sufficient margins in an increasingly competitive environment.

Luxembourg has been a global funds industry centre since the 1980s, so it is no surprise that it is a place where technology and financial expertise come together. A large number of FundTechs have set up shop in the Grand Duchy, either to provide tools to support the industry, or to tap into Luxembourg's expertise in asset management to improve their own products.

"SEQVOIA is based in Luxembourg, a country that brings together all major players in the fund industry, a multitude of service providers, and an array of government-backed organisations working to develop the local scene – all but two hours from the major European financial centers! This unique environment allows SEQVOIA to keep its finger on the pulse of the market, validate ideas with the industry and implement solutions in line with client needs."

Susanne Schartz,
COO, Seqvoia

ALTERNATIVE LENDING

Alternative funding methods have proliferated since the 2008 financial crisis as access to bank credit has tightened. Crowdfunding platforms have formed part of this solution. Projects in need of capital can draw funds in the form of small contributions from large numbers of individuals, instead of one large contribution from a single financial institution. Contributions can come in the form of donations or investments on which cash providers expect to generate a return.

In Europe, crowdfunding is regulated via the new European Crowdfunding Service Providers Regulation (ECSPR), which came into force on 10 November 2021. This provides the possibility for crowdfunding providers to leverage the possibility to passport their activities across the European Union based on a regulated entity licensed in one member state.

TYPES OF CROWDFUNDING¹¹

Peer-to-peer lending

Cash is lent to a company by a wide range of people, on the understanding that the money will be repaid with interest. (Similar to a bank loan)

Equity crowdfunding

The company provides shares in return for investment (similar to some venture capital investments)

Rewards-based crowdfunding

The company receives cash from individuals in return for a non-financial return at some point in the future – such as access to a particular good or service provided by the company

Donation-based crowdfunding

Company receives charitable donations from individuals

Profit-sharing / revenue-sharing

Companies receive investments from individuals in return for a future share of the income from the project or asset

Debt-securities crowdfunding

Individuals invest in a debt security issued by the company, such as a bond

While crowdfunding platforms provide channels to target investment on a peer-to-peer basis, there has been significant growth of interest in looking at ways such platforms can also work with institutional investors. This increases both the firepower of such investment platforms, while providing potentially attractive returns for institutional investors at a time of persistently low interest rates.

Institutional investment in crowdfunding products frequently takes place via a

securitisation process rather than by direct investment on the platform (which may not be possible due to regulation or the internal investment policies of the investors.) Several leading companies in the field rely on Luxembourg securitisation vehicles, building on the Grand Duchy's established expertise in this field. Luxembourg also harnesses the expertise of its alternative fund industry to provide innovative offerings in the loan funds sector, which as of end-2021 had € 181.7bn in assets under management.

“We chose Luxembourg for the first step in our international expansion – the ecosystem, infrastructure and political environment are particularly favourable & business friendly. Luxembourg is ideally positioned with all the main actors in easy reach. The country is certainly open for business.”

Oliver Schimek,
CEO & Founder, CrossLend

CROSSLEND

CrossLend provides a technology-driven platform, connecting loan originators and institutional investors across borders and asset classes.

¹¹ Sourced from European Commission

CYBERSECURITY AND AUTHENTICATION

As critical services become increasingly connected and web based, so opportunities for cybercrime increase. As a result, financial institutions are increasingly including cyber security within their broader risk management frameworks, highlighting the business-critical nature of digital systems.

Incidents are increasingly reported to regulators, as is required under a number of European and national regulations.¹² As part of the European Commission's Fintech action plan, work is also underway to create a more unified cyber and operational resilience framework throughout the EU, in the form of the upcoming Digital Operational Resilience Act (DORA).

Luxembourg has a long track record in developing and deploying security and authentication solutions. Luxembourg's interdisciplinary centre for security, reliability and trust (SnT) is a centre of excellence which partners with leading financial companies on research and development of innovative solutions.

In 2017 the Luxembourg government created the C3 cybersecurity competence centre, providing observation, training and testing of cybersecurity services, including Room #42, a cyberattack simulation environment.

On the authentication side, Luxembourg is also home to companies providing digital identity services along with data security services, both for local and international companies and citizens.

"As a Fintech company, Luxembourg offers a great ecosystem where you can develop yourself. Our products and services are easy to be offered to clients anywhere in Europe, and the strategic position as well as the IT infrastructure of the Grand Duchy plays an important role in this. Moreover, we receive incomparable support from the government and from Luxinnovation, two factors which make the country the ideal birthplace for innovative enterprises and startups: Luxembourg has all the ingredients to stay a major digital player in Europe."

Jean-Pierre Schmit,
CEO & Founder, Jemmic

JEMMIC

Jemmic is a Fintech company serving banks and financial institutions: it enables customers to accelerate their digital transformation and to implement it in a secure and agile way. Over thirty banks with a million online users rely on Jemmic to securely authenticate their customers and offer them an integrated customer portal.

¹² For example the NIS Directive, GDPR, the eIDAS regulation, PSD2 all have provisions for some form of incident reporting. Significant financial institutions and market infrastructures also have reporting provisions either to the ECB or their national central banks.

REGULATION

05

REGULATION

WHY YOU NEED A LICENCE

In the EU, as soon as a Fintech company offers financial services, has anything to do with financial flows or accesses client data, it will need a licence.

For a Fintech company, being well regulated significantly enhances its standing with its counterparts, and even provides protection for the company itself.

GATEWAY TO THE EU

Beyond serving the local financial industry, Luxembourg is an outstanding launch pad for Fintech companies. With a single licence, they can leverage the European Passport and do business in all the European member states.

Luxembourg's central location and multilingual society also make it an ideal place for companies looking for a

European base to develop their business across the EU. This can be particularly useful for more mature companies, which have developed their products or services in another, often non-European market, and are seeking to broaden their client base. The European Union, with its 450 million consumers, offers a stable market – and Luxembourg, in its role as an EU gateway, is the perfect entry point.

"The passporting of the licence is relatively straightforward while having cross-border regulatory arrangements is not always easy. However, the regulator is always open for discussion which is amazing to me. We have a very interactive dialogue – even when we propose something very new, they don't push it back. Rather, they look into it and start to discuss how to make things happen rather than rejecting it. The attitude is very positive, and that is helping us to expand our services."

Toshihiko Otsuka,
CEO, Rakuten Europe Bank

RAKUTEN

Rakuten is a Japanese e-commerce conglomerate and online financial services giant which chose Luxembourg to establish its pan-European bank.

WHAT IS FINANCIAL SERVICES PASSPORTING?

All member states of the European Union are part of the European Single Market – an economic area created by the integration of the markets of the EU member states (27) and the European Economic Area (+5). Goods and services circulate freely in this market, and businesses established inside it have far-reaching rights to sell their products and services in any part of the Single Market.

For over twenty years the scope of the EU single market has increasingly extended into trade in financial services, with countries in the European Union opening their national markets to the provision of financial services directly from other EU member states.

Once a financial services firm is established and authorised in one EU country, it can apply for the right to provide certain defined services throughout the EU, with this authorisation being known as a financial services ‘passport’. These passports are not available to ‘third country’ firms, i.e. firms incorporated outside the EU. Non-EU firms face significant regulatory barriers to providing cross-border banking and investment services to customers in many EU member states.

Luxembourg’s reputation for excellence in cross-border financial services provision makes it the perfect place for Fintech startups and scaleups to locate a European hub.

Luxembourg’s main financial services regulator – the *Commission de Surveillance du Secteur Financier* (CSSF) – is unmatched in its long experience of authorising and regulating financial institutions, providing Fintechs with a robust and stable regulatory environment

in which to develop cross-border products and services throughout the EU. Communication with the regulator, as well as licensing applications and official documentation can be undertaken in three languages, including English.

Cross-border expertise also extends to the Luxembourg legal sector. The courts and lawyers are highly experienced in dealing with contracts governed by different legal systems. Company statutes and articles of incorporation can also be submitted in English.

“Ever since we got to Luxembourg we felt supported and welcomed by an ecosystem that has given us everything we needed to work in the most efficient way. We have been here for some years now and today we can sense how the proximity to the European institution here can really be an asset to our business.”

Samuele Pinta,
co-founder and CFO

A TECH-FRIENDLY LEGAL FRAMEWORK

Luxembourg is committed to fostering innovation by building on its regulatory expertise and ensuring that technology-based financial services are efficiently regulated. The government and regulatory bodies closely study emerging technology models and are adept at applying traditional legal principles in combination with the latest EU directives.

Luxembourg's legal framework is forward-looking and pragmatic. It provides legal security and predictability, while at the same time avoiding unnecessary administrative burdens. It is also especially designed to cater to the digital economy. For instance, in May 2017 Luxembourg was the first country to pass cloud-friendly legislation to protect the best interests of both providers and clients. The Luxembourg law guarantees that data owners can easily recover data in the event that a Luxembourg-based cloud provider goes bankrupt. The law allows for the customer data to be kept separate from other files in the cloud providers' systems.

The Grand Duchy was the first EU country to establish an operational legal framework for electronic archiving, in 2015. The legislation confirms the legal value of digital documents and, under certain conditions, provides substantial guarantees of their compliance with the original. This makes Luxembourg a unique place for financial institutions in need of operating most of their business digitally (i.e. without using paper).

Luxembourg passed a new law in 2019, permitting the use of distributed ledger technology for the registration of securities. The new law provides greater transparency and legal certainty on the use of distributed ledgers and blockchain technology by deeming it equivalent to other secured electronic recording mechanisms for the transmission of securities. In 2020 Luxembourg started work building on this foundation to expand the legal basis for using new technologies such as DLT in the issuance

of securities, and the Grand Duchy also set up a new regime for the registration and supervision of Virtual Asset Service Providers (VASPs) for the purposes of AML and CFT supervision.

The CSSF has an established and solid reputation for competence, as well as openness to innovation, and has adopted a tailored and responsive approach to Fintech regulation. In 2021 The CSSF set up a dedicated innovation hub consisting of a dedicated point of contact for any person wishing to present an innovative project or to exchange views on the major challenges faced in relation to financial innovation in Luxembourg.

As an example, of this dialogue in action, In November and December 2021, the CSSF published guidance on how asset managers and credit institutions can interact with virtual assets, while in January 2022 it released a whitepaper with recommendations for the usage of DLT in the financial services sector. Moreover, in March 2018 the CSSF published a position paper on robo-advisory, showing how this Fintech approach to asset management meshes with existing regulation. When providing solely investment advice, robo-advisors should register as investment advisers, in the same way as non-automated financial advisors. Where robo-advisors provide portfolio management they should register with the CSSF in the same way as other portfolio managers. Other services, such as brokerage or other forms of intermediation could also be covered by other existing authorisations.¹³

The CSSF identifies and appraises potential risks and assesses the potential benefits of new innovations. It also reviews whether there are regulatory barriers to business models that can be addressed within existing regulatory requirements. The CSSF also ensures that all relevant legal texts and filings are available in English.

¹³ CSSF's position paper on Robo-advice, 27 March 2018

“Our role is to observe and to listen to the financial sector’s needs, and we will need to have very practical communication around the evolution of technology which its members envisage.”

Marco Zwick,
Director, CSSF

FINTECH AS A SERVICE

Luxembourg’s established financial ecosystem is a key market for those B2B Fintechs which provide specific technology services to licensed financial institutions rather than being licensed as financial institutions themselves. Such relationships are based on a strong foundation of trust between the provider and the financial institution and often require careful and painstaking due diligence work, in coordination with the procurement divisions of large-scale financial institutions.

In order to help streamline this process, in January 2019 the Luxembourg House of Financial Technology and some of its members established the FIN5LAB, which offers due diligence and integration services. Fintechs or financial institutions can choose from a variety of due diligence checks depending on their needs. The options vary from a due diligence questionnaire to full-scale testing on the

connectivity, robustness, scalability and security of the Fintech solution connected to the FIN5LAB environment. For integration, the Fintechs connect to a core banking sandbox environment designed by leading banking software company Temenos.

Luxembourg also offers a special regulated status for technology service providers working in the financial services industry, the “Professional of the Financial Sector” (PFS), which allows them to supply a variety of support services to regulated financial services providers, including communications services and IT systems.

This approach ensures a high level of data security and reduces operational risks for financial institutions when they entrust some of their operational processes to third party service providers.

ECOSYSTEM

06

```

mirror_mod = m

# set mirror object
mirror_mod.mir

if _operation == "
    mirror_mod.use
    mirror_mod.use
    mirror_mod.use
elif _operation ==
    mirror_mod.use
    mirror_mod.use
    mirror_mod.use
elif _operation ==
    mirror_mod.use
    mirror_mod.use
    mirror_mod.use

#selection
mirror_ob.select
modifier_ob.select
bpy.context.scene
print("Selected")
#mirror_ob.se
#one = bpy.conte
#bpy.data.ob
except:
    print("Error")

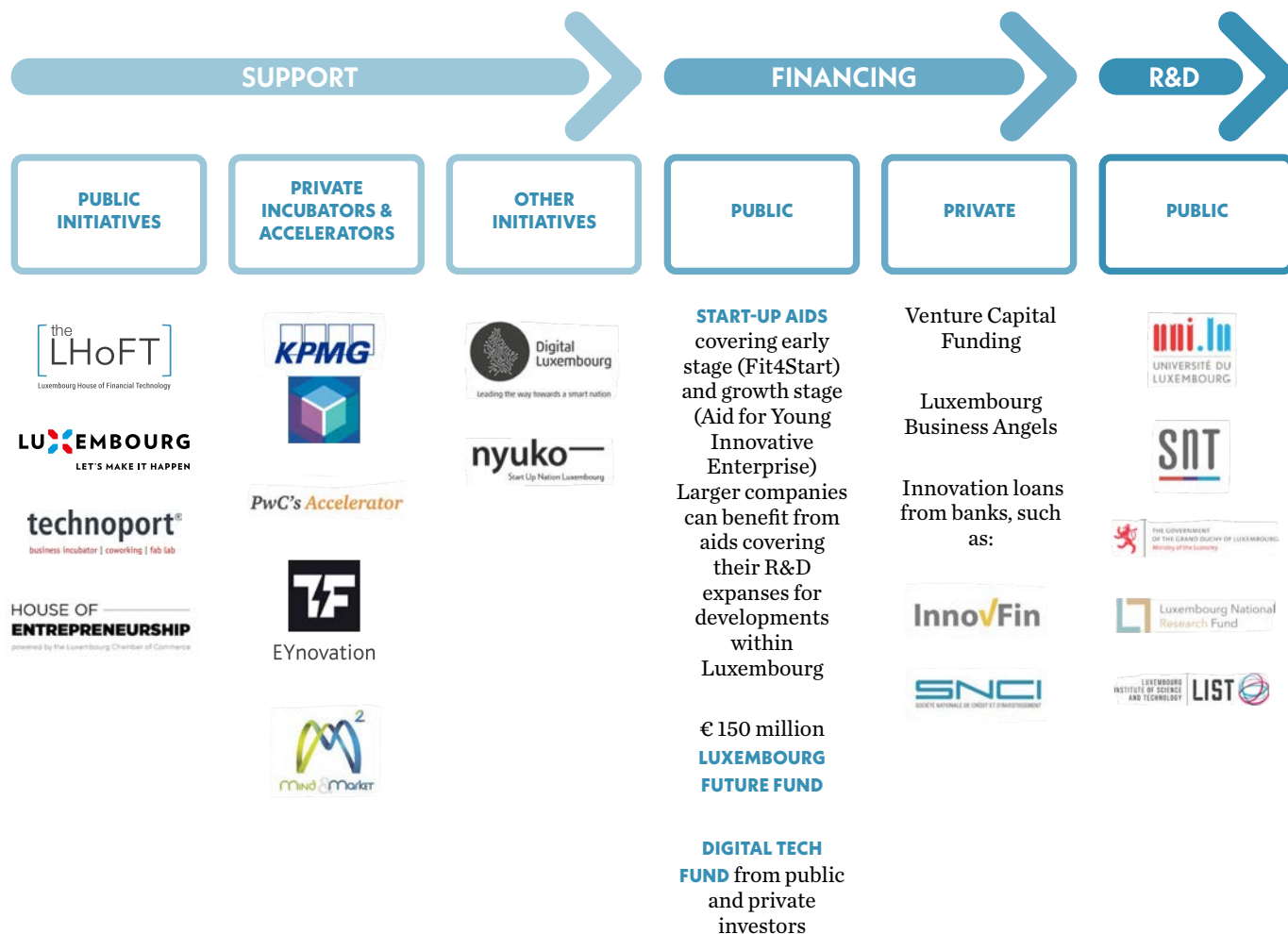
#----- OPERAT
# Mirror Tool

class MirrorX(bpy.types.Operator):
    """This adds an X mirror to
    bl_idname = "object.mirror
    bl_label = "Mirror X"

    @classmethod
    def poll(cls, context):
        return context.active_

```

ECOSYSTEM



A BROAD ECOSYSTEM TO SUPPORT FINTECH DEVELOPMENT

In Luxembourg, Fintech start-ups can rely on a strong network of private and public incubators and accelerators, as well as on a winning combination of private and public funding sources, and a variety of events, awards, and networking opportunities.

INCUBATION AND ACCELERATION

The Luxembourg House of Financial Technology (LHoFT)

The LHoFT Foundation is a public-private sector initiative which aims at driving forward technological innovation to the wider benefit of Luxembourg's financial services industry.

LHoFT hosts Fintech firms in its co-working facility and supports their growth. The foundation partners with large corporations from the financial services and technology industries to help them meet their innovation goals as well as to access the right people and resources.

The foundation's wider remit is to connect the domestic and international Fintech communities in order to stimulate the development of solutions which will shape the world of tomorrow. Senior executives from 13 leading private sector institutions sit on its board as leadership circle partners, alongside representatives from the Luxembourg

Government, leaders of the Luxembourg Chamber of Commerce, Luxembourg for Finance and PROFIL, the Luxembourg Financial Industry Federation.

The Luxembourg House of Financial Technology is much more than just an incubator; its role is to build and nurture Luxembourg's Fintech ecosystem. LHoFT aims to extend the ecosystem worldwide by linking up with other leading Fintech hubs around the world and by bringing together and collaborating with domestic and international stakeholders on industry-wide projects, working groups and initiatives.

The LHoFT provides a soft-landing platform with individually tailored support for Fintech firms setting up in Luxembourg and seeking access to the European market. The goal is to facilitate their launch, be it by organising meetings with key ecosystem stakeholders, training and education, or even helping with house hunting if required.

Incubators and acceleration programmes

Luxembourg hosts several other incubator and accelerator initiatives to support innovative companies in Fintech and other tech-related sectors:

- › Luxembourg House of Start-ups (HoST) is a start-up hub located in the centre of the capital and is run jointly by the City of Luxembourg and the Chamber of Commerce. Housed in a 4,200 m² facility, HoST hosts the Luxembourg City Incubator, offering accommodation to start-ups, and Check Point, which provides access for startups to experts in the fields of law, accounting, web design and marketing. LHoFT's offices are also located in the same building.
- › Technoport is a leading international incubator, offering business incubation, co-working and even a Digital Experience Studio. The incubator supports companies launching and international businesses seeking a first foothold in Luxembourg. Technoport offers various incubation programs, comprising a full range of services, and has three locations in Luxembourg: in Belval, Luxembourg's city of science; in Foetz, where it also offers industrial space and workshops, and in Differdange's 1535° Creative Hub, where it operates Fab Lab, an open prototyping platform for digital manufacture.
- › The University of Luxembourg operates its own incubator on its Belval campus in support of its entrepreneurship programme for students, alumni and staff.
- › The House of Entrepreneurship is Luxembourg's one-stop shop for company creation, providing assistance with business permits, tax & legal issues, as well as public funding. The House of Entrepreneurship is an initiative set up by the Luxembourg Chamber of Commerce, in collaboration with the Ministry of Economy. The Nyuko organisation is also hosted at the House of Entrepreneurship, where it provides entrepreneurial support and free-of-charge development services for new business ideas.
- › Luxembourg-based start-ups with substantial market traction and products capable of scaling on the US market can also benefit from the international programme of Silicon Valley's Plug & Play Tech Center. The programme provides intensive training and access to international investors, as part of Silicon Valley's most successful accelerator programme. The programme is run by the Ministry of Economy and Luxinnovation.

Various private initiatives also offer acceleration and incubation services

Le Village by CA Accelerator backed by Crédit Agricole, and part of a wider network across Europe.

LEPLATEAULUX Innovation lab of Société Générale Luxembourg, providing selected external startups with workspace and collaboration with the bank

PWC ACCELERATOR AND EXPERIENCE CENTRE Part of a network of over 30 experience centres worldwide

THE KHUBE Entrepreneurship and networking facility set up by KPMG Luxembourg

EYNOVATION Acceleration services programme provided by EY

DELOITTE BOOST Acceleration programme provided by Deloitte

TOMORROW STREET Innovation centre set up jointly by Technoport and Vodafone

THE FOUNDRY Co-working space and access to professional services organised by Mason Bower

INNOHUB Soft-landing platform and accelerator set up by a network of partners to support the development of national and international scale-ups

EVENTS, AWARDS AND COMMUNITY

Conferences, awards and competitions

ICT Spring

ICT Spring is a Global Tech Conference hosting an array of International Professionals. This two-day annual event is held in Luxembourg City and offers participants an excellent opportunity to deepen their knowledge of the fast-growing Fintech Industry, and gain insights into the impact of space technologies on terrestrial businesses, through exhibitions and demonstrations of the latest trends in tech and innovation. ICT Spring is also the perfect place to network with peers and meet potential future business partners.

Arch Summit

Set in Luxembourg City, Arch Summit is the premier event for connecting tech startups with corporate decision-makers. Arch brings together innovators and influencers in a dynamic two-day programme of startup pitches, tailored meetings, keynote speeches, tech roundtables, and exhibitions on the latest developments in technology.

Luxembourg Fintech awards

Luxembourg's national Fintech awards aim to bring the best of financial technology to Europe's leading financial centre.

Prizes include € 50,000; four months of hosting at the Technoport; 10 free consulting hours from KPMG; and a free LHoFT membership, including six months of hosting at the LHoFT Fintech hub.

Pitch your startup

Pitch Your Startup (PYSU) is an international startup competition that aims to attract the best and brightest startups from around the world to Luxembourg. The winner of the competition can receive € 50,000, and there are a range of in-kind prizes.

CATAPULT: Kickstarter

Kickstarter is an acceleration programme aimed at helping early stage Fintech entrepreneurs develop their business model. The programme features guidance and support from expert mentors, plus the opportunity to pitch to an elite group of judges for subsidies of € 50,000.

CATAPULT: Inclusion Africa

Developed by the LHoFT Foundation, the program targets those companies focused on financial inclusion in Africa, seeking to build bridges between the continent and Europe. The programme highlights their initiatives and is very much aligned with the sustainability goals of Luxembourg's financial centre.

CATAPULT: Inclusion Africa leverages Luxembourg's Inclusive Finance and Fintech ecosystem to support 13 selected firms in developing their businesses and achieving their inclusion goals.

NadiFin

The NadiFin Acceleration programme focuses exclusively on cutting-edge Fintech startups that are using AI/ML, Big Data Analytics, Blockchain and other "deeptech" tools to create seamless solutions and businesses for the European financial services market.

The NadiFin programme engages a broad network of investors and strategic partners to facilitate real-world progress outside the classroom. The cohort competes in a trade-marked peer-voting startup accelerator curriculum, which could potentially lead to a € 100,000 investment.

Techstars Startup Weekend

Techstars Startup Weekend is a programme organised annually in Luxembourg as part of a worldwide network of such meetups. During the weekend, participants come together to form teams, turn ideas into prototypes and receive feedback from experienced entrepreneurs.

Game of Code

An annual hackathon, where teams compete to develop a product in 24 hours and face a variety of Fintech and digital challenges.

Luxembourg Acceleration Bootcamp

A week-long total immersion acceleration programme organised by the Luxembourg House of Startups to stimulate the development of new European companies. It is also a good way of forging links with leading corporations, institutions and investors.

Luxembourg Cybersecurity Week

A week-long campaign held in October, which encompasses a wide variety of events and partners in Luxembourg focused on cybersecurity. It is held under the aegis of European Cybersecurity Month.

Community and networking

Fintech Fridays

A monthly Fintech networking event organised by the LHoFT, bringing together Fintech entrepreneurs, executives, VCs, Fintech enthusiasts and business angels.

Startuppers Night

The evening offers the entire Luxembourgish startup community the chance to celebrate their ecosystem in a completely different environment. While most events are centred around pitches and round tables, Startuppers Night takes a different approach. The idea is to get to know each other, relax and have fun.

Lëtzblock

LëtzbBlock is a non-profit association created to promote the thriving Luxembourg Blockchain ecosystem. Giving a voice to blockchain in Luxembourg, we connect, educate, inform, and inspire through events, working groups, advocacy and more.

CLUSIL (Club de la Sécurité des Systèmes d'Information – Luxembourg)

Association for information security professionals with about 200 members from all economic sectors in Luxembourg and the “Greater Region”.

LOIC

The Luxembourg Open Innovation Club is an initiative dedicated to the development of business relations between large accounts, intermediate-sized enterprises and innovative startups through open innovation.

FINANCING

07

FINANCING

A major factor in the success of any Fintech company is access to funding to further its development. Luxembourg offers both public and private financing. In addition, Luxembourg's financial centre is also a great place to meet potential clients.

PUBLIC FUNDING SCHEMES

Several funding schemes co-financing RD&I activities within Luxembourg-based companies are available as subsidies from the Ministry of the Economy. Luxinnovation, the national agency for innovation and research, advises and supports companies through the process of applying for public funds. In addition, the agency also acts as a national contact point for European funding programs, such as Horizon 2020.

Examples of funding schemes include:

- › Aid for small innovative enterprises enables start-ups to benefit from a grant of up to € 800,000 under certain conditions.
- › The aid for process and organisational innovation supports companies conducting projects in this field. For SMEs, project-related costs such as wages can be co-financed by up to 50%.
- › Aid for research and development (R&D) projects or programmes supports companies by co-financing costs related to R&D projects carried out in Luxembourg. The scope of the aid varies with the size of the company and the type of research. Companies collaborating with research institutions can receive a larger amount of aid.

Fit4Start

An early-stage funding and acceleration programme geared towards innovative early-stage start-ups active in ICT. The program offers 16-week mentoring support on the lean start-up methodology, free access to co-working space in an incubator, as well as € 50,000 funding. For those companies which successfully graduate from the programme, the Ministry of Economy grants an additional € 100,000 on condition that a € 50,000 funding round is secured.

The Luxembourg National Research Fund (FNR)

The National Research Fund (FNR), as the main funder of research activities in Luxembourg, helps bring research and industry together, through facilitating research and development partnerships. Such collaborations are a win-win for both sides: businesses gain access to creative minds, while researchers get the chance to take their research to the next level and

see it make an impact. The Industrial Fellowships (PhD and Postdoc grants to researchers) programme and the BRIDGES programme (project-based funding) foster cooperation between Luxembourg-based companies active in R&D and public research institutions in Luxembourg and/or abroad.

Luxembourg Export Credit Agency (ODL)

The ODL offers various support schemes for the international development of Luxembourg companies. This includes grants to attend trade fairs, design and translation of promotional support, related advertising costs, as well as the opening of representation offices outside the EU, as well as other development costs.

PUBLIC FINANCING

Luxembourg Future Fund

This EUR 150-million fund is a joint initiative between the European Investment Fund (EIF) and the Luxembourg government through its National Credit and Investment Company (SNCI). It aims to invest in innovative SMEs planning to launch in Luxembourg. Three sub-funds can invest in Venture Capital funds, co-invest with VC funds, or co-invest with Business Angels or Family Offices.

Digital Tech Fund

Founded by the Ministry of Economy and backed by high-profile private and public investors, the € 20m Digital Tech Fund provides seed financing to entrepreneurs running innovative start-up companies active in the field of Digital Technologies. The fund's aim is to foster long-term innovation and to support the technology start-up ecosystem in Luxembourg.

"The Digital Tech Fund is a public-private partnership early stage venture capital fund. The backers include the Ministries of Finance & Economy, as well as several of the most influential players in banking and technology here in Luxembourg. It's a great way for us to meaningfully support local innovation and teams expanding the digital transformation in the region. It's a natural parallel, as we manage our global portfolio, which relies on the UN Sustainable Development Goals, from right here in the Grand Duchy, as well."

Expon Capital Team

PRIVATE FINANCING

InnovFin – EU Finance for Innovators

InnovFin is an initiative by the European Investment Bank, in cooperation with the European Commission under Horizon 2020. The program provides loans and guarantees either directly through the EIB group or indirectly via banks for SMEs to large corporates. In this way it aims to cover the whole of the research and innovation value chain.

SNCI

The Luxembourg state investment bank SNCI offers several loan schemes, including a start-up loan as well as a loan for “Innovative enterprises”. The latter is granted to companies operating in an innovative technological industrial field or in an innovative technological, commercial, and/or organizational area. In specific cases, SNCI also makes equity investments.

Banking support

Luxembourg is a centre for corporate banking, and this also extends to financing and banking services for startups. Many corporate banks in Luxembourg offer special services for startups and innovative companies, some offered in coordination with the wider InnovFin programme. Several banks also run their own innovation hubs and accelerators in the Grand Duchy.

“#LePlateauLUX, our open-innovation lab is an opportunity to strengthen our links with the local ecosystem and to contribute to our innovation strategy: the expertise and value that selected startups add to our projects enable us to accelerate our transformation. In addition, thanks to seminars, roundtables and conferences hosted by #LePlateauLUX, we are able to expose our staff to new technologies, new ideas and new ways of working.”

Bertrand Kauffmann,

Digital Transformation Leader, Société Générale Luxembourg

Investment funds hub

Out of the top 100 asset managers in Europe, 98 have funds domiciled in Luxembourg, and the world's 19 largest private equity firms do business from the Grand Duchy. Asset managers in Luxembourg invest in companies of all sizes, ranging from seed and early stage companies all the way through to listed giants.

“Luxembourg has been the home base of Mangrove for the last 20 years and more than ever this turns out to be a wise choice. We are following with great interest the numerous fintech initiatives launched here over the past years. A great symbiosis between the historic strengths of Luxembourg’s financial center and the world of new technologies.”

Hans-Juergen Schmitz,
Managing Partner Mangrove Capital Partners

Following the UK’s vote to leave the EU in 2016, many financial institutions decided to relocate activities and resources to Luxembourg, either by establishing a new entity in the country or, in many cases, expanding existing operations in the Grand Duchy. In the investment funds sector, several companies have decided to move their investment advisory functions to Luxembourg, while some private equity firms have relocated their key deal-making functions here.

Business angels

Luxembourg is home to a local Business Angels Network, which is a member of the European EBAN association. The association’s members are highly active in early stage start-up investment, both individually and through co-investment. They invest primarily in seed and series A funding in a wide variety of sectors, including Fintech.

INFRASTRUCTURE

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INFRASTRUCTURE

LEADING CONNECTIVITY

Enterprise connectivity and ICT infrastructure are crucial to modern digital financial operations and secure data storage is also a key imperative.

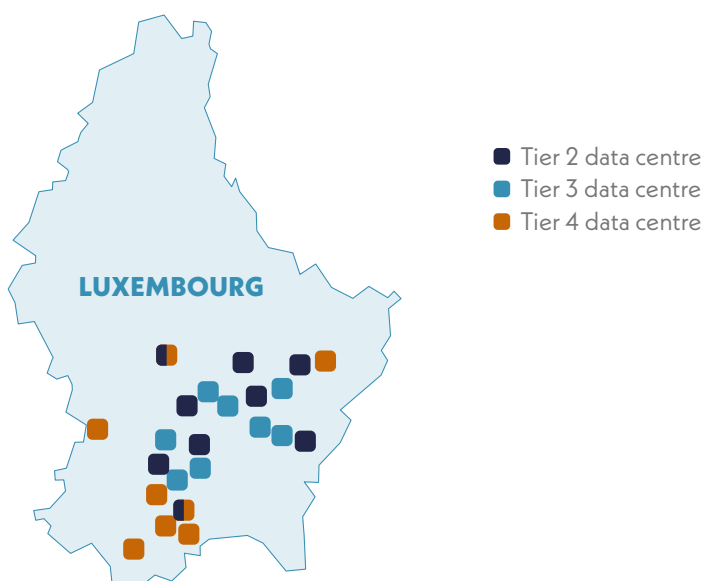
Luxembourg offers world class IT infrastructure and connectivity. Luxembourg is almost fully covered by fast fixed broadband networks and also has very good coverage of very high-capacity networks (VHCNs), with 72.1% coverage of fibre to premises and 88.9% of Docsis 3.1.¹⁴

Numerous global leaders in the IT, e-commerce, Telecom, and satellite industries serve European and global markets from Luxembourg. All of them rely on Luxembourg's state-of-the-art infrastructure, which boasts the highest density of Tier 4 data centres in Europe. Luxembourg also ranks number one globally for bandwidth.

SECURE DATA CENTRES

Luxembourg is home to around a quarter of European Tier 4 data centres, providing the ultimate in security, redundancy and reliability. Together with the available Tier 1-3 data centres, businesses can choose

from a range of data centres perfectly suited to their specific needs, a number of them running on 100% green energy. Data colocation providers are also abundant.



¹⁴ European Commission, Digital Economy and Society Index (DESI), 2021

HOST COUNTRY TO THE FIRST E-EMBASSY IN THE WORLD

The government of Estonia chose Luxembourg to open its e-embassy. Operational as of 2018, it is the first of its kind worldwide. Based in a high-security data centre, the e-embassy stores copies of Estonia's most important and confidential data and it ensures continuity in the event of a major cyber-attack or natural disaster. The e-embassy is governed by the same sovereign territory principles as those embodied in the Vienna Convention for physical embassies.

Other international institutions, such as NATO and the European Patent Office, also rely on Luxembourg to store critical data.

ULTRA-LOW LATENCY HUB

Centrally located, Luxembourg has an ideal geographical situation to provide ultra-fast data connections to all other major European financial centres. Luxembourg is connected with major European cities and financial centres via

27 ultra-low latency fibre routes, with an average round-trip time of around five milliseconds. Over 30 carriers offer a wide range of telecommunication solutions leveraging this infrastructure.

HIGH-PERFORMANCE COMPUTING (HPC)

Luxembourg is at the centre of the European High-Performance Computing project. As part of the European Commission's Horizon 2020 program, Luxembourg launched a world-class supercomputer in 2021. The supercomputer, named MeluXina, is a BullSequana XH2000 with a computing capacity of 18 petaflops per second, and is able to rapidly perform complex calculation in areas like **modelling and simulation, data analytics, machine learning and artificial intelligence**. HPC is a unique tool that helps generate business value. With the help of HPC, data are quickly interpreted, evaluated and visually projected in order to show patterns and guide researchers and engineers to better products, models or processes.

Luxembourg is the headquarters of the European High Performance Computing Joint Undertaking (EuroHPC JU), which is a joint initiative between the EU, European countries, and private partners to develop a world class supercomputing ecosystem in Europe.

The European Commission is on record as saying that it regards the HPC project as equally significant for the EU's industrial future as the foundation of Airbus in 1970. The EC believes it will significantly enhance Europe's competitiveness vis-à-vis China and the US.



COLLABORATION

09

COLLABORATION

RESEARCH AND DEVELOPMENT

The University of Luxembourg is ranked first worldwide for its international outlook,¹⁵ and plays a strong role in attracting highly skilled talent to the country. The institution excels in both fundamental and applied research, with both its faculties and research centres engaging in private sector partnerships that help drive innovation forward in the country. Companies who participate in joint projects with the University do so first and foremost to increase their competitive edge in an economy being rapidly changed by technology. Other benefits include being able to access public funding available for research purposes and collaborating with academic experts and PHD candidates who are passionate about working on market-driven challenges. These projects commonly wrap up with the private-sector partner employing the PhD candidate, providing an additional talent sourcing channel and allowing for a smooth knowledge transfer into the local economy.

The Interdisciplinary Centre for Security, Reliability and Trust (SnT) at the University of Luxembourg is particularly active in the financial services domain, with deep expertise in Fintech and Regtech related technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and Distributed Ledger Technologies (DLT). SnT's team of 320 researchers and staff have a strong history of private sector partnerships, collaborating with over 45 partners from Luxembourg and abroad, including many financial sector actors. In 2019 SnT initiated a partnership with the Luxembourg financial regulator, the CSSF. This project is set to significantly streamline the process to verify regulatory compliance.

“Working on concrete projects with companies ensures our research has an impact beyond the academic world, which is very rewarding. As we look towards the future, we will continue to build our momentum in Fintech while diversifying into the service industry; pursuing more partnerships with the insurance sector and regulatory bodies.”

Björn Ottersten,
Director of SnT

¹⁵ Times Higher Education World University Ranking 2020

Besides the University, the Luxembourg Institute of Science and Technology (LIST) is a mission-driven Research and Technology organisation. Specifically, to the financial sector, the centre has formed a team covering business analytics in areas such as regulatory compliance technologies as well as governance and process quality improvement.

Collaboration between research and industry players is a two-way street in Luxembourg, as is evident by a number of research Chairs in a variety of fields of financial services, including the Clearstream Chair in Capital Markets and Post Trade, the ADA Chair in Financial Law (Inclusive Finance), and SnT's Paypal-FNR PEARL Chair in Fintech.

INDUSTRY COLLABORATION

In addition to official collaboration on public research, the highly networked nature of the Luxembourg financial centre also lends itself to collaboration and partnership in the Fintech space.

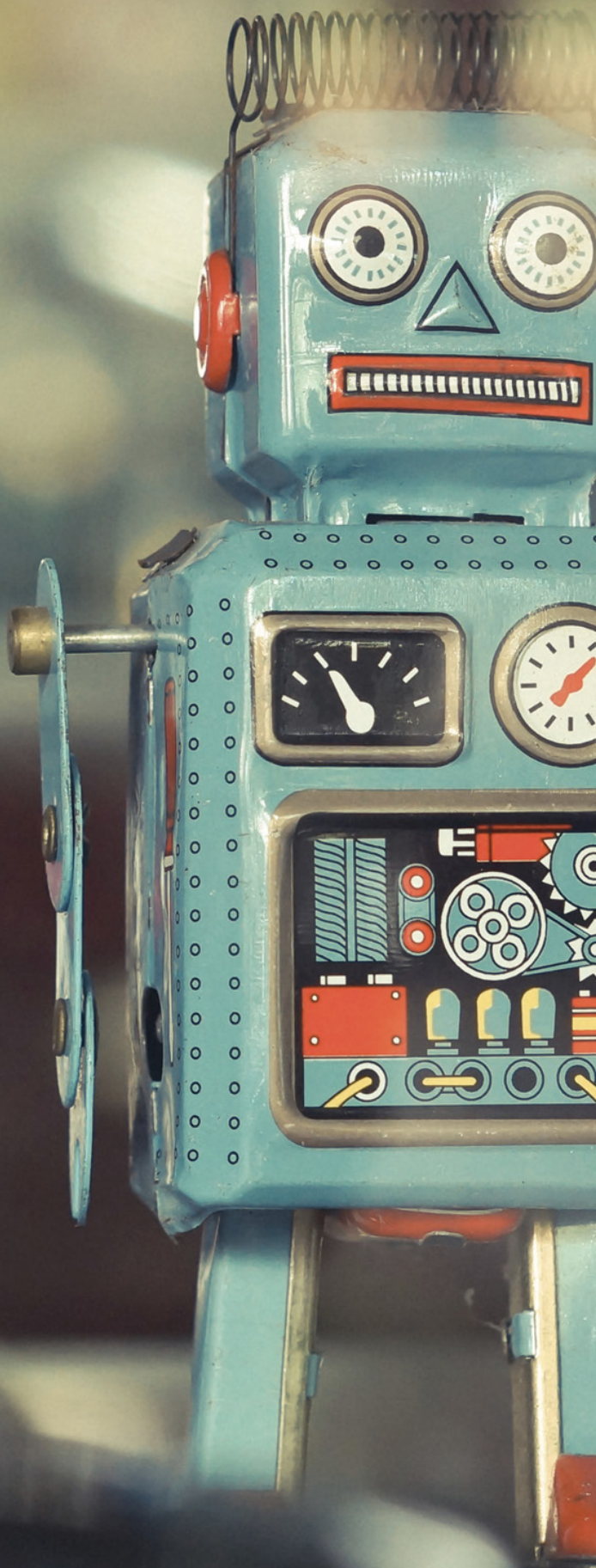
In May 2018, several Luxembourg retail banks grouped together to form LUXHUB. The initiative aims at simplifying and accelerating compliance with PSD2 (EU Payments Services Directive II) and interconnecting the banks and third-party provider (TPPs) ecosystem. LUXHUB is open to any bank with EU-wide ambitions impacted by PSD2. In 2019 LUXHUB was ranked in the top three open banking platforms in Europe.

HQLAx is a Fintech innovation firm set up in 2018 specialising in delivering liquidity management and collateral management solutions for institutional clients in the global securities lending and repo markets. In December 2019, HQLAx announced the first live transactions on its platform.

A collaborative approach is also taken towards helping Fintechs overcome some of the difficulties involved in working with large incumbent multinational players, particularly during the onboarding process. In January 2019 for example, the LHoFT, together with its partners, launched FIN5LAB – a platform to speed up Fintech procurement processes. For further information on this project please see the Regulation chapter in this brochure.

TALENT

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TALENT SOURCING AND DEVELOPMENT

Luxembourg's labour market is another attraction for Fintech startups. Situated between France to the west, Belgium to the north and Germany to the east, Luxembourg has nearly five million potential workers living within a one-hour commute. EU freedom of movement also means they are entitled to cross borders to work in the Grand Duchy. As such, Luxembourg can draw on a deep pool of potential employees from the surrounding regions. This is in addition to the international expat community that feels so at home in Luxembourg. Indeed, the country ranks first worldwide for attracting talent and sixth for retaining it.¹⁶

Fintech is also being applied to the recruitment process in Luxembourg, with digital platform MoBerries actively working with the financial industry to access over 60,000 candidates from all over the world. The platform can integrate directly with any existing applicant tracking system, providing an easy way to upload job specifications and quickly match them with candidates in the system.

Luxembourg's cosmopolitan character makes it the most multilingual country in Europe, with the average resident proficient in over three languages¹⁷. English is widely spoken – and Luxembourg ranks 11th worldwide for proficiency in the language¹⁸. Not surprisingly, 48% of Luxembourg's population are foreign, representing 170 nationalities.

The country also emphasizes life-long-learning with specific courses. The House of Training, in collaboration with the banking association ABBL, developed a range of courses on digital banking and Fintech innovation, covering such topics as digital banking transformation, distributed ledger technology, data analytics, and social engineering (cybersecurity).

Luxembourg ranks first in the world in terms of the ICT skills¹⁹ of its workforce and employee productivity is the second highest in the EU.²⁰

¹⁶ The Global Talent Competitiveness Index 2021, INSEAD

¹⁷ Eurobarometer

¹⁸ EF English Proficiency Index 2020

¹⁹ Networked Readiness Index, 2021

²⁰ Eurostat Productivity Index 2020

“Luxembourg appeared an obvious choice due to its central geographical location, with less than an hour's flight from Pictet's headquarters in Geneva. The country also offers a large talent pool composed of experts in IT and finance, from Luxembourg and beyond. This is further enhanced by the government's proactive policy of granting European work visas to ease access for international talent.”

Vincent Eggen,
Managing Director, Pictet Technologies

A GREAT PLACE TO LIVE AND WORK

One of the reasons why Luxembourg scores so highly for talent attraction and retention is that it offers an excellent quality of life alongside opportunities for business growth. Luxembourg City is ranked the safest city in the world, with a cost of living which is significantly lower than competing locations like central London, Paris or Zurich. As of March 1, 2020, free public transport was also introduced across the country, further enhancing Luxembourg's affordability.

Luxembourg also has excellent connectivity to other European locations. Its airport is 10 minutes from the city

centre and offers regular commuting-distance flights to all major European hubs. Luxembourg is part of the visa-free Schengen travel zone, allowing travel to 26 EU countries without the need for border checks. EU Blue Card work permits for qualifying non-EU nationals are also available.

Luxembourg is a family-friendly environment with a good selection of private, state and international schools, offering education in multiple languages, including English, and a range of qualifications, from A-Levels, to the European and International baccalaureate.

LUXEMBOURG'S GOT TALENT!

Luxembourg has access to a large, highly skilled and multilingual talent pool



A DEEP TALENT POOL

+11 million inhabitants Luxembourg lies at the heart of Europe's largest cross-border region

5 million people live within a 1 hour commute to Luxembourg City

+135,000 students **6 universities** within a 100km radius, cooperating closely as part of the **University of the Greater Region**



ATTRACTING TALENT FROM ACROSS THE WORLD

First globally for **job security**¹

Visa-free Part of the Schengen **visa-free** travel zone
Availability of **EU Blue Card** work permits

Multicultural **47.4%** of the population is **foreign**
More than **180 different nationalities**

1st in the world for **attracting talent**²



MULTICULTURAL

+170 More than **170** different **nationalities**

Highly ranked for **attracting** and **retaining talent**

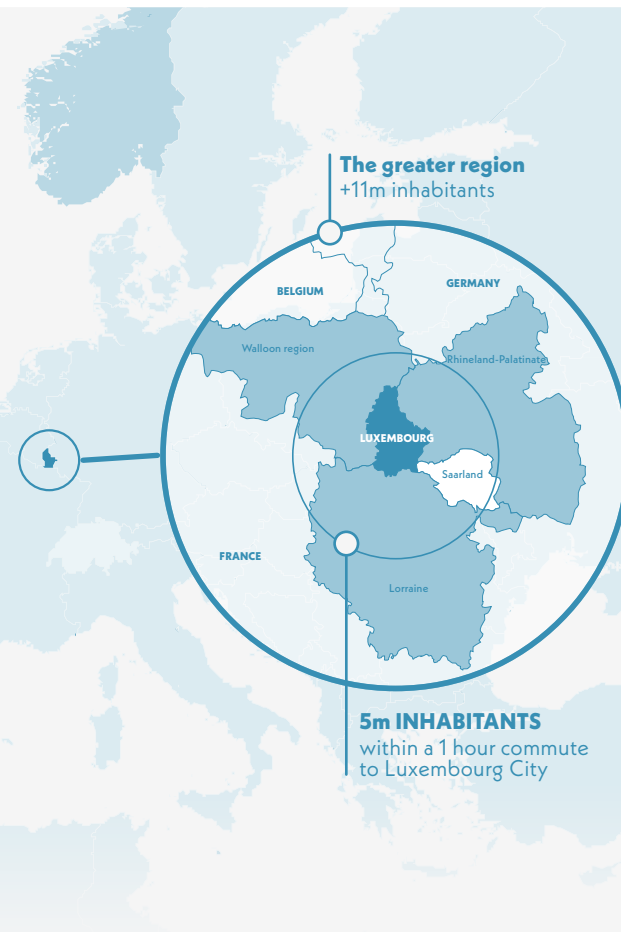


A MULTILINGUAL, HIGHLY SKILLED WORKFORCE

One of **One of the Eurozone's leading financial centres**³

3.6 Most **multilingual** country in Europe: Luxembourg's population speaks an average of **3.6 languages**⁴

11th Fluent in English: **11th** in the World for **English proficiency**⁵



Sources: ¹ Expat Insider 2021, ² INSEAD Global Talent Competitiveness Index 2021, ³ GFCI, ⁴ Eurobarometer & European Commission, ⁵ EF EPI English Proficiency Index 2020

USEFUL CONTACTS

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USEFUL CONTACTS

PUBLIC SECTOR

Luxembourg Government

www.gouvernement.lu

Digital Luxembourg

<https://digital-luxembourg.public.lu/>

Ministry of Finance

www.mf.public.lu

Ministry of Economy (Invest in Luxembourg)

www.investinluxembourg.lu

Luxembourg for Finance

www.luxembourgforfinance.com

Luxinnovation (National Innovation Agency)

www.luxinnovation.lu

Luxembourg Chamber of Commerce

www.cc.lu

REGULATORS

Luxembourg Financial Services Regulator (CSSF)

www.cssf.lu

Luxembourg Insurance Regulator (CAA)

www.caa.lu

INDUSTRY ASSOCIATIONS

The Luxembourg Bankers' Association (ABBL)

www.abbl.lu

Association of the Luxembourg Fund Industry (ALFI)

www.alfi.lu

Luxembourg Private Equity and Venture Capital Association (LPEA)

www.lpea.lu

Luxembourg Insurance and Reinsurance Association (ACA)

www.aca.lu

Emerging Payments Association EU (EPA EU)

www.emergingpayments.eu/

FEDIL Luxembourg Business Federation

www.fedil.lu

FUNDING

Luxembourg Future Fund

www.eif.org/what_we_do/resources/lff/index.htm

National Credit and Investment Company (SNCI)

www.snci.lu/en

Digital Tech Fund

www.exponcapital.com

Luxembourg Business Angel Network (LBAN)

www.lban.lu

InnovFin – EU Finance for Innovators

www.eib.org/products/blending/innovfin/index.htm

Fit4start

<https://fit4start.luxinnovation.lu>

Luxembourg Export Credit Agency (ODL)

www.odl.lu

ECOSYSTEM PROVIDERS

Luxembourg House of Financial Technology (the LHoFT Foundation)

www.lhoft.com

Luxembourg House of Start-ups (HoST)

www.host.lu

Technoport

www.technoport.lu

INFORMATION SERVICES

ABBL Fintech Overview

www.fintechmap.lu

The Intellectual Property Institute Luxembourg (IPIL)

www.ipil.lu

Luxembourg Portal for Innovation and Research

www.innovation.public.lu

Luxembourg Business Portal

www.guichet.public.lu/entreprises/en

Nyuko

www.nyuko.lu

House of Entrepreneurship

www.houseofentrepreneurship.lu

LEARNING AND DEVELOPMENT

House of Training

www.houseoftraining.lu

The University of Luxembourg

www.uni.lu

Interdisciplinary Centre for Security, Reliability and Trust (SnT)

www.en.uni.lu/snt

Luxembourg Institute of Science and Technology (LIST)

www.list.lu

National Research Fund

www.fnr.lu

LIFE IN LUXEMBOURG

Just Arrived

www.justarrived.lu

Guichet

<https://guichet.public.lu>

Caisse Nationale de Santé (CNS)

www.cns.lu

Doctena

<https://en.doctena.lu/>

AtHome

www.athome.lu/en/

Movetolux

<https://movetolux.com>

ABOUT LUXEMBOURG FOR FINANCE

Luxembourg for Finance (LFF) is the Agency for the Development of the Financial Centre. It is a public-private partnership between the Luxembourg Government and the Luxembourg Financial Industry Federation (PROFIL). Founded in 2008, its objective is to develop Luxembourg's financial services industry and identify new business opportunities.

LFF connects international investors to the range of financial services provided in Luxembourg, such as investment funds, wealth management, capital market operations or advisory services. In addition to being the first port of call for foreign journalists, LFF cooperates with the various professional associations and monitors global trends in finance, providing the necessary material on products and services available in Luxembourg. Furthermore, LFF manages multiple communication channels, organises seminars in international business locations, and takes part in selected world-class trade fairs and congresses.

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