Investment barriers in the European Union 2023

A report by the European Investment Bank Group

European Investment Bank | Group

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European Investment Bank
98-100, boulevard Konrad Adenauer
L-2950 Luxembourg
+352 4379-1
info@eib.org
www.eib.org
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Foreword

Investment is crucial to the EU economy as it fosters economic growth, job creation and innovation. Investment enhances productivity, infrastructure development and overall competitiveness, contributing to the long-term stability and prosperity of the region. A business-friendly environment provides vital support to the European economy, which is currently facing various deep structural challenges, macroeconomic shocks and fierce global competition, as well as the challenges associated with climate and digital transitions, energy security and social and economic cohesion.

Several barriers hinder investment and economic growth in the European Union, including regulatory complexity, bureaucratic hurdles and differing national policies. Investment barriers diminish the economy's productive capacity and suppress long-term economic growth and employment. For example, regulatory uncertainty creates risks about the potential revenue of projects, which in turn reduces their viability and therefore investment, private sector interest and innovation. Fragmented markets diminish producers' incentives to invest by reducing the potential size of the end-market. This makes large investments in research and development or new production capacity even more uncertain and risky. Weak planning and project preparation capacity among promoters in the public sector reduces the efficiency of government investment. This undermines the scope of the public sector to enhance future economic prospects. Without adequate access to finance, companies — especially those that are small or medium businesses – cannot roll out the investment necessary to fulfil their potential to innovate and grow. In turn, this limits the creation of new jobs.

Addressing investment barriers is essential to stimulate financial support and to enhance sustained economic development in the European Union. Many stakeholders in the European Union, most notably the European Commission, but also individual Member States, are committed to removing obstacles to investment. The European Investment Bank Group, with 65 years of project experience and market knowledge across many countries and economic sectors, has first-hand experience of barriers that hamper the implementation of investment projects on the ground. The European Investment Bank's analysis of project-level investment barriers is aggregated at the economic sector level and constitutes part of project due diligence and the continuous monitoring of the investment environment in which the Bank operates. This experience is directly relevant to EU initiatives that aim to improve the investment environment.

This project experience is further complemented by information gathered through various European Investment Bank Group investment surveys, collecting data on investment barriers from the perspective of EU and US companies. The annual European Investment Bank Group Survey on Investment and Investment Finance (EIBIS) is an EU-wide survey that gathers qualitative and quantitative information on investment activities by small and medium businesses and larger corporates, including their financing requirements and the difficulties they face. Such survey data provide a wealth of unique firm-level information about investment decisions and related financing choices. The European Investment Bank Municipality Survey, covering 744 municipalities across the European Union, gathers data on past and planned investments, as well as the obstacles municipalities face and their progress on digital and green transitions.

The European Investment Fund focuses on small and medium businesses and collects complementary information about investment barriers from the perspective of finance practitioners. The fund regularly performs general and specific market research (for example, by-products, countries or investment theme), undertaking a range of equity and private debt surveys among financial intermediaries. The fund also cooperates with the European Microfinance Network on a survey of microfinance providers. These surveys are powerful information tools. The 2023 European Investment Fund Venture Capital Survey, for example, received 472 responses from venture capital general partners and therefore offers a very representative picture of the market regarding sentiment, challenges and barriers and selected topics of high policy relevance. For example, the topics this year are scale-up financing, European strategic autonomy and the role of people, particularly their skills, and diversity.

Understanding what is happening on the ground and the barriers faced by projects, companies, and finance practitioners when investment projects are designed and implemented is the first step in creating and offering appropriate policy support measures. The European Investment Bank Group continues to build and share knowledge and information about investment barriers and is ready to support policy measures that tackle such obstacles across sectors and EU Member States.

Teresa Czerwińska
Vice-President
European Investment Bank

Executive summary

This report describes and examines barriers and bottlenecks to investment in EU Member States as encountered and observed by the European Investment Bank (EIB) and the European Investment Fund (EIF). In addition, the report includes complementary findings from EIB Group surveys of EU corporates and finance practitioners, with some illustrative case studies.

Economic context

The European economy entered a soft-landing phase in the second half of 2023, with downside risks going forward. Slowing economic growth, high uncertainty and tight monetary policy pose a threat to firms' investment plans. Simultaneously, the competitiveness of EU firms is increasingly being challenged by structural factors, and investment needs related to digitalisation and climate change are becoming more urgent. Preserving investment for the digital and green transformation and competitiveness of the EU corporate sector during times of tightening fiscal space requires effective and targeted incentives and catalytic public investment.

Summary – Part 1: Investment barriers encountered in EIB operations

At the project level, this year's report highlights barriers related to climate investments by examining the forestry sector, commercial power purchase agreements (PPAs) and climate-resilient roads. The report also explores a critical issue in the health sector, namely that of antimicrobial resistance. Finally, investment barriers are examined in the context of cross-border projects — investments much needed to ensure efficient functioning of the EU single market.

Forestry

Investments in the forestry sector have the potential to contribute positively to various crucial issues in the sector, such as mitigating climate change, developing the wood-based bioeconomy and protecting biodiversity. However, a lack of coordination between the various policies and strategies affecting the forestry sector can lead to inertia, or even an inability to act. In addition, many wood-processing companies consume a lot of energy and are therefore sensitive to regulations that affect energy prices. The lack of adequate insurance mechanisms is a growing barrier to investment in the forestry sector given the risks associated between increasing forest stocks and more frequent extreme climate-related events, such as forest fires. In addition, forestry sectors across the European Union are highly fragmented in general, with many small and medium businesses and microenterprises, which results in relatively high unit costs. Combined with the high volatility of timber prices, these factors make investment risky and uncertain. Constraints on public sector developers can also increase the costs and risks incurred by private investors when investing in projects involving the public sector. Moreover, while environmental, climatic and commercial contexts have become more complex, the budgetary capacities of the public forestry sector have not increased to the same extent. Finally, assessing the expected benefits of a forestry investment and its degree of risk can be challenging for external financiers (particularly when small companies, startups or innovation investments are involved) if there is not enough information available. This is often the case in the forestry sector, where information on forest resources (species, qualities, dimensions) is often insufficient and/or difficult to access. This makes it difficult for investors in value chain activities to make informed decisions.

Commercial power purchase agreement markets

Technological advances and the steep decline in the cost of renewable energy projects over the last two decades has allowed some markets to develop and operate competitive renewable energy without the need for public financial support. Concurrently, more corporates are seeking to "decarbonise" their operations and are looking for credible proof of such decarbonisation to show their customers and shareholders. Long-term PPAs between a renewable energy project and an offtaker have become an increasingly popular tool to demonstrate the "greening" of corporate power consumption. Policymakers have shown a strong interest in commercial PPAs as they view these agreements as a fiscally attractive way to support the renewable energy sector (instead of public support schemes) and increase market efficiency. Commercial PPAs are a vital tool to de-risk projects (or project portfolios) and are therefore often central to investment decisions. However, the commercial PPA market remains confined to a relatively small number of corporate buyers because of its complexities and the counterparty risk requirements involved. The demand for corporate PPAs from offtakers remains constrained by investment barriers such as a lack of regulation, concerns about creditworthiness, difficulties in managing exposure to power price risks, and the challenges arising from the longer-term nature of commercial PPA contracts.

Resilient roads

Climate change has brought new challenges to preserving the operational resilience of transport systems under stress from the impacts of climate change. While investment is needed to adapt transport infrastructures to the impacts of climate change, additional approaches are needed to anticipate, absorb, accommodate or recover from these impacts. However, there are numerous barriers hindering the necessary investment in climate change resilience. These include the fast-evolving and incipient regulatory environment, its complexity and its lack of legal clarity. The market for road adaptation and resilience is considerable but is currently experiencing fragmentation and a limited and immature supply of specialised services. There is also an absence of broadly accepted methodological standards for resilience solutions. Public project promoters face considerable budget constraints and lack the necessary expertise and strategic policy guidance. In addition, investments in resilience appear to have limited eligibility under national investment budgets. Designing resilience programmes so that they can be classified as fiscal investments, rather than just maintenance, is a prerequisite for facilitating investment in resilience in EU Member States. Enabling and supporting promoters to take advantage of the various EU funds and schemes for investments in resilience would be instrumental in incentivising such investment in the Member States.

Antimicrobial resistance

Antimicrobial resistance directly impacts human and animal health and carries a heavy economic burden because of the treatment costs and reduced productivity caused by sickness. Antimicrobial resistance threatens health advancements made by modern medicine, as routine medical procedures may become impossible to perform due to the risk of untreatable, life-threatening infections. Furthermore, investments to address the problem face numerous barriers. First, the uptake of new antibacterial treatments is slow because new products are reserved for drug-resistant infections to preserve their effectiveness. Consequently, the traditional reimbursement model that underpins the commercial value of assets — where revenues are linked to sales volumes — undervalues advances in the field compared with the benefits they bring to society. This generates a negative incentive for developers and suppliers of novel antimicrobial resistance products that reaches across the value chain, lowering the appeal of research, development and innovation activities in the sector. In addition, differing healthcare systems and budgets across the Member States fragments and complicates the market for companies considering investment. The issues in the field of antimicrobial resistance are often insurmountable for small and medium businesses and mid-cap firms, for which the commercial risk translates into financial risk as it directly increases their cost of capital and ability to attract investors.

Cross-border projects

Cross-border infrastructure projects are central to the completion of the EU single market because they enhance connectivity and reinforce economic and social cohesion. However, cross-border infrastructure projects still face many investment barriers and challenges. Common barriers derive from the inherent nature of cross-border projects, that is, they involve two or more countries and often span difficult terrain. These barriers lead to common consequences such as longer lead times and/or cost overruns compared with typical infrastructure projects that take place within a single country. They may also lead to a lower and more dispersed economic interest linked to an asymmetric distribution of costs and benefits, which can make them a lower priority for one or more of the national governments involved.

Summary – Part 2: EIB Group survey-based evidence

The second part of the report summarises survey findings on investment and financing barriers at the company level. The survey results are complemented by several illustrative case studies. The survey evidence presented covers the view of EU corporates as well as some insights from municipalities and finance practitioners. The findings are drawn from the 2023 edition of the EIB Group Survey on Investment and Investment Finance (EIBIS) and the 2022 edition of the EIB Municipality Survey. In further detailing the financing conditions facing small and medium businesses and emphasising the critical issue of inadequate employee skills as a significant barrier to investment, this section then reports on the EIF SME Access to Finance Index (ESAF) and various EIF surveys of finance practitioners: EIF Venture Capital Survey, EIF Private Equity Mid-Market Survey and a survey on European microfinance providers.

The case studies of skills and education in small and medium businesses illustrate how EIF funding can help overcome investment barriers and exemplify how the EIF addresses a specific thematic priority: supporting skills and education. Investments in skills contribute to growth, competitiveness and social convergence, as well as addressing challenges related to digital transformation in the labour market and the shift to a carbon-free economy and society.

Non-financial corporates and small and medium businesses

This year, high uncertainty and monetary policy tightening have had a major impact on the investment outlook and the barriers to investment encountered by businesses. The 2023 EIB Group Survey on Investment and Investment Finance shows that a growing percentage of firms, particularly small and medium businesses, are reporting financial constraints in both the European Union and the United States. Among longer-term barriers to investment, those most frequently cited by firms were high uncertainty, a shortage of skilled staff, and — particularly in the European Union — high energy costs. Meanwhile, green and digital transitions are continuing on the ground. EU firms have stepped-up investment in advanced digital technologies but still need to maximise the returns from their investments. In addition, the climate emergency is becoming increasingly pressing. While EU firms are investing more in energy efficiency, their investment in adaptation remains too low and the firms face long-term challenges to their global competitiveness stemming from persistently higher energy costs versus those of key global competitors (namely, the United States).

The European Union has proven relatively resilient to the recent sequence of shocks that have hit its economy, including the COVID-19 pandemic and geopolitical turmoil. However, persistent inflation and rising interest rates are adding to the financing challenges faced by small and medium firms in the European Union. Tight financial conditions could prove to be a significant constraint for the ongoing post-pandemic recovery process, as economic growth has been sluggish of late.

Higher interest rates have significantly increased funding costs for small and medium businesses, potentially leading to a deterioration of existing debt portfolios. In addition, higher interest rates are creating a challenging environment for private equity and venture capital, raising concerns about a potential reduction in the supply of risk finance for innovative small and medium businesses.

The short-term risks to growth are on the downside, as Russia's aggression against Ukraine continues and inflation is set to remain above the target of the European Central Bank (ECB) in the near future. In the medium term, climate risk and mounting mitigation and adaptation investment needs may prove to be an additional risk factor that could crowd out other productive investments. This leaves a vital role for policymakers in ensuring a continuous flow of financing to Europe's most innovative and most vulnerable small and medium businesses, in the face of rising capital expenditures and elevated capital costs.

The EIF SME Access to Finance Index shows that the COVID-19 pandemic negatively impacted the sentiment of small and medium business owners and that businesses of this size remain more likely to be financially constrained compared with large firms. The index also shows that the COVID-19 impact was particularly heavy for small and medium businesses in South-Eastern Europe, where business sentiment was markedly more pessimistic than in the rest of the European Union.

Financial market practitioners

Private equity or venture capital remains an essential source for startup, young and high-growth companies to create value, often through innovation. Preliminary results from the most recent EIF Venture Capital Survey show that fund managers are particularly concerned about fundraising and the exit environment. At the level of their portfolio companies, recruiting high-quality professionals with appropriate skills remains very challenging. Within the management teams of portfolio companies, skills gaps are observed in leadership/people management, selling/pitching and strategic planning. Fund managers that can provide professional advice and access to networks can help bridge such gaps.

Microfinance has evolved to encompass microenterprises and self-employed individuals. Inclusive finance extends these services to vulnerable groups and social enterprises, promoting entrepreneurship and social inclusion. Microenterprises face financing and skill-related challenges, particularly during crises like the COVID-19 pandemic. Microfinance institutions struggle with clients' digital capabilities, which was especially evident during social distancing measures in the COVID-19 pandemic. Embracing digitalisation can improve communication and outreach for microfinance institutions. Moreover, clients often need coaching and mentoring in other areas. Some microfinance institutions offer non-financial services, with a focus on green practices.

Part 1: Investment barriers identified in EIB operations

Introduction

Investment barriers in the European Union 2023: A report by the EIB Group focuses on investment barriers faced by projects in the sectors of forestry, commercial PPA markets, resilient roads, antimicrobial resistance and cross-border projects. The taxonomy of investment barriers used in this report was developed and published by the EIB in 2016.[1] Reporting is presented at sub-sector level (for example, renewable energy), as project-level reporting would be unrepresentative and would render comparisons between projects difficult. Furthermore, the selection of EIB projects each year may not be sufficiently representative of the sectors and/or Member States where investment barriers are a major issue. Knowledge of many projects in a sub-sector is required to collect enough evidence of investment barriers. This normally requires a sample over several years of projects.

Reporting on investment barriers at a sub-sector level entails several caveats:

- The concept of investment barriers is commonly used but not well-anchored in economic theory. As indicated above, the sector examples are based on the taxonomy of investment barriers developed by the EIB.
- Most investment barriers are structural and sector specific. However, some financial market failures, especially those involving access to finance by small and medium businesses, may also have a cyclical element to them. In this context, meaningful annual reporting on investment barriers can be challenging.
- Investment barriers should not be confused with market failures. Market failures provide a public policy body with justification for intervention. In addition, market failures pertain to the real economy (for example, knowledge spillovers) or financial markets.2 Hence, for example, if there is no "x" for the investment barrier "access to finance" in the attached examples, this does not imply that the financial markets function free of market failures. Even if access to finance is not indicated as one of the investment barriers, there may still be market failures that justify public policy intervention.
- The EIB can only report on sectors and countries where it is active and familiar with the investment environment.
- The summary table, as presented in each example, is a visual tool and should be interpreted with caution. A "tick" in a table does not imply comparability between sectors and countries. Moreover, even within a sector and/or country, there are caveats that are explained in the text.

[1] The publication can be found at Breaking Down Investment Barriers at Ground Level (eib.org).

[2] As commonly understood in economics, market failures include public goods, externalities, imperfect competition and market power, incomplete markets and coordination failures, and incomplete and imperfect information.

Forestry

Summary

Investment Barriers	EU Level	Comment
Regulation		
Regulatory uncertainty	X	See main text and case studies 1, 2 and 3
Regulatory fragmentation	X	See main text and case studies 1 and 3
Administrative procedures	X	See main text and case study 1
Market size and structure		
Lack of EU-wide standards	X	See main text and case study 3
Fragmented market structure	X	See main text
Public sector promoter constraints		
Budgetary constraints	X	See main text and case study 4
Difficulties in coordinating funding resources		
Weak planning and project preparation capacity		
Access to finance		
Local and regional public infrastructure providers		
Smaller corporates and SMEs	X	See main text and case study 5

Introduction

The forestry sector encompasses all economic activities aimed at producing goods and services from forests. These include activities related to silviculture, forest management, harvesting of wood from forests, extraction of non-wood forest products, transport, processing of wood in forest industries[3] and downstream use of the resulting products.[4] The sector also includes the production, trade and use of forest ecosystem services such as carbon sequestration and the financial assets derived from them.[5]

The forestry sector plays a key role in climate change mitigation through its ability to sequester carbon in forest ecosystems and produce carbon-storing materials from harvested wood that can replace carbon-intensive products (for example, concrete, steel and plastics). The forestry sector also contributes to climate change adaptation, for example through protecting soil against harmful erosion and improving its water retention capacity. In addition, sustainable forest management[6] provides a wide range of ecosystem services, such as habitats for flora and fauna, amenity values for recreation, and numerous non-timber forest products. Agroforestry systems also contribute to food security.

The EU forestry sector (forestry and forest-based industries) generates gross added value of approximately €165 billion a year and employs over 3.6 million people. Moreover, this sector has significant untapped potential for sustainable economic growth and social development, especially in rural areas. In particular, if the world is to meet its targets on climate change, biodiversity and land degradation, investment in nature-based solutions must at least triple in real terms by 2030, and quadruple by 2050.[7] For the EU, this acceleration would be equivalent

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3 This concerns the Statistical Classification of Economic Activities in the European Community (NACE) section A (agriculture, forestry and fishing), division 02 (forestry and logging). This division includes the production of roundwood and the extraction and gathering of wild-growing non-wood forest products.

4 As per the NACE codes, the forest-based industries are part of section C (manufacturing), divisions 16 (manufacturing of wood and products of wood and cork), 17 (manufacturing of pulp, paper and paper products), 18 (printing and service activities related to printing) and 31 (manufacture of furniture). We also include here the manufacture of chemicals from wood (20.16 plastics in primary forms; 20.14 other organic chemicals; 20.6 man-made fibres; 20.53 essential oils), the manufacture of textile fibres (13.10) and the production of electricity from wood biomass (31.11).

5 The production of ecosystem services falls under NACE section A (agriculture, forestry and fishing). The management of the derived assets (for example, carbon or biodiversity credits) is categorised under section K (Financial and Insurance Activities), division 66 (Administration of financial markets).

6 Sustainable forest management includes specific actions for maintaining and enhancing environmental benefits, biodiversity and ecosystem services, and the sustainable production of renewable biomaterials.

7 State of Finance for Nature 2021 | UNEP - UN Environment Programme.

to an annual investment of at least €90 billion [8] per year by 2050 in afforestation, reforestation, forest management, agroforestry and peatland restoration.

However, barriers to investment can prevent this potential from being fully realised. The role of the EIB, as a public bank, is to help overcome these barriers. The following section describes the four types of barriers encountered in the forestry sector at the EU level and presents five case studies illustrating these barriers.

Investment barriers

1. Regulation

Sustainable forestry sector operations contribute to various crucial issues, such as climate change mitigation, development of the wood-based bioeconomy and protection of biodiversity. One consequence of this multifunctionality is that the sector appears at multiple decision-making levels through different authorities, as witnessed for example by the number and diversity of Directorates-General involved in the forestry sector at EU level.[9] This approach is mirrored at national and regional levels across Member States. These different levels of decision-making often rely on divergent, sometimes orthogonal, definitions of sustainability for the forest sector. For example, some authorities want to promote carbon sequestration in forests, whereas others want to develop the use of wood in industry by stimulating harvesting and processing. Furthermore, some want to promote the preservation of biodiversity, for example, by conserving old trees in forests or requiring continuous forest cover. The result is a rich regulatory arsenal, but one which is organised in silos. The lack of coordination between different policies and strategies can lead to inertia, or even to an inability to act. This is an illustration of the curse of dimensionality in a political context, where mechanisms and objectives find themselves drowned in too vast a space and uncoordinated at a higher level. When it comes to investment decisions, this regulatory multidimensionality creates uncertainty and risk for investors and discourages them from financing sustainable forestry projects. To reduce these uncertainties, long-term, mutually consistent EU and government commitments are needed.

At another level, regulations also directly impact input prices. Many wood-processing companies are energy-intensive and therefore sensitive to regulations affecting energy prices. Although mechanical and chemical forestry industries[10] produce much of their own energy from processed wood residues, the industries that have to purchase it incur costs up to two and a half times those in the United States. As energy prices are unlikely to fall significantly in the European Union, woodworking industries will only be able to save money by investing more in process and energy efficiencies and by producing renewable energy from wood resources.

Finally, wood is a low-density material and bulky to transport. Infrastructure and transport systems occasionally pose constraints, such as restrictions in EU Member States and variability between them regarding truck dimensions and weight limits, as well as non-integrated transport systems characterised by the poor quality of public roads in remote forest areas. This often leads to higher operational costs, impacting the competitiveness of certain EU forest-based businesses, especially small and medium ones.

2. Market size and structure

Market fragmentation can be defined as a market that is not well integrated. Several levels of fragmentation increase transaction costs and reduce the competitiveness of the forestry sector and related industries.

First, fragmentation of ownership (or land tenure rights) and the small size of forest holdings often lead to economic inefficiencies in forest management (higher transaction and operating costs), discourage investment in sustainable forestry practices, and pose greater management challenges linked to the provision of ecosystem services, voluntary certification or access to instruments such as payments for environmental services. Moreover, the long period between investment in the forest and income from tree harvesting means that small forest holdings cannot generate a recurrent annual income,[11] which discourages forest owners from investing. In addition, fragmentation impacts the cost of investment, as risks cannot be pooled, and access to investment, as each forest owner usually has to negotiate individually with banks. Small owners also find it more difficult to reduce the risks associated with their investments, due to higher insurance costs. More generally, the lack of

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8 $1 = €0.91 as of 31 July 2023.

9 These Directorates-General (DG) include, but are not limited to DG AGRI, DG CLIMA, DG ENV, DG GROW, DG ENER, DG EISMEA, DG INTPA and DG TRADE.

10 Such as the sawmilling or pulp and paper industries.

11 Forest product markets have a particular time horizon: the investor's time horizon is shorter than the moment when a new plantation starts generating income from logging. Therefore, by the time they wish to withdraw, the initial investor may not yet have a solid history of cash flow, but only a standing asset with uncertain revenue prospects.

adequate insurance mechanisms is a growing barrier to investment in the context of increasing forest stocks associated with more frequent extreme weather events.

Second, with the exception of the pulp and paper industry and parts of the wood-based panels and sawn timber sub-sectors, and despite the significant consolidation that has occurred in the last few decades, the EU's forestry industries are highly fragmented and comprise numerous small and medium businesses and microenterprises. This results in relatively high unit costs, as these companies cannot benefit from the economies of scale enjoyed by larger competitors outside of the EU, unless they group together into cooperatives or similar collaborative entities. These costs, combined with the high volatility of wood prices, makes investment risky and uncertain. In addition, vertical coordination between forest owners and other players in the value chain, notably timber traders and buyers, is generally insufficient. Except for recognised forestry cooperatives in the Nordic countries, forest owners do not participate in the value created in downstream sectors, which limits their income from timber sales and their ability to invest in sustainable forest management.

Furthermore, the predominance of informal information flows and business habits is a major obstacle to investment, reducing the level of competition in the market (through reducing the entry of new players into the market) and increasing the risks associated with information asymmetry.

3. Public sector promoter constraints

The forestry sector is unique in that it generates numerous positive environmental and climate externalities. In this respect, the benefits generated by investment projects are not only captured by the agents who bear the costs of their production. In such cases, government intervention is necessary to achieve socially desirable levels of investment with their corresponding outcomes. However, constraints on public sector promoters, owing to limited budgets or institutional capacities, are obstacles to investment. More specifically, these constraints can increase the costs and risks faced by private investors when investing in projects involving the public sector. In the future, these budgetary constraints will be exacerbated by the need to invest in climate risk management (forest fire risk in the case of Mediterranean countries, or windthrow risk in certain continental regions), which will absorb significant portions of the budget of government agencies, leaving them unable to invest in other necessary projects.

While the environmental, climatic and commercial contexts have become more complex, the budgetary capacities of the public forestry sector have not increased to the same extent. Today, forestry authorities have to deal with forest fires, extreme weather events, and pests and diseases, as well as reporting on criteria and indicators of these items. They must also deal with the problems of absentee forest owners, act as intermediaries, control and resolve conflicts around the multiple demands for forest use for hunting, recreation, and biodiversity conservation, and meet new demands for ecological maintenance and education, while developing new approaches to facilitate carbon sequestration and other payments for ecosystem services schemes. All this is happening under the watchful eye of the public, which is increasingly vocal about issues such as naturalness and tree felling. This places a burden on forestry authorities and adds complexity to the identification and definition of good investment projects.

In addition, there is insufficient public research and development (R&D) funding to develop promising forestry initiatives. National public R&D funding for new forestry techniques and supply chain infrastructure is essential to unlock the commercial and social potential of sustainable forestry. However, the problem does not stop at research funding, as moving new bio-based materials, such as textiles or bioplastics, from the research laboratory to the factory floor requires a costly increase in production capacity that new market entrants do not have the capacity to fund.

4. Access to finance

Assessing the expected benefits of a forestry investment and its degree of risk can be difficult for external financiers, particularly for certain types of investors (for example, small businesses and startups) and certain types of investments (for example, in the field of innovation) if there is not enough information available. This is often the case in the forestry sector, where information on forest resources (species, qualities, dimensions) is lacking and/or difficult to access and does not allow informed decisions to be made in value chains.

Barriers to financing in the forestry sector also stem from a lack of knowledge in identifying and structuring bankable projects, including commercially viable models for forest landscape restoration, as well as a poor understanding of how to generate returns and grow the business through feasible investments supported by public funds (repayable and non-repayable). This includes difficulties in monetising and integrating forest ecosystem services into business plans.

In addition, forestry investments are often overlooked by investors looking for quick and high returns. Investments in forestry initiatives can take 5–20 years to reach positive cash flow and typically only produce modest returns. Consequently, such investments do not have a reputation of being attractive financial opportunities, although some projects, such as agroforestry, can improve investment profitability through achieving positive cash flows from food crops sooner than those of purely forestry investments. One consequence of this is that forestry investment attracts investors who are less interested in optimising the management of the product of their land (timber in particular) than in speculating on the price of forest land.

Case study 1: Investment barriers in the European non-timber forest products sector

Demand for many non-timber forest products such as cork, resin, tannins and aromatic plants is expected to increase.[12] This demand is driven by the need to reduce dependence on non-renewable resources and move towards a sustainable, circular bioeconomy, by the renewed interest in natural ingredients for healthy eating and personal care, by the increasing demand for traditional products with a strong cultural heritage, and by the growing interest in experiential services in tourism or recreation, such as wild food gathering.

However, over the last century, Europe's ability to supply and sustain profitable value chains for non-timber forest products has declined, with Europe becoming increasingly dependent on imported equivalents or losing markets directly to fossil fuel-based substitutes. For example, despite increasing demand, EU cork production has halved from over 400 000 tonnes per year in 1963 to less than 180 000 tonnes per year in recent years. Limited supply is the biggest current constraint on the European cork industry, as one-third of traditionally managed cork oak forests have been abandoned. Similarly, due to declining profitability, EU pine resin production has fallen from 300 000 tonnes a year in the 1960s to less than 10 000 tonnes a year at the beginning of the 21st century. However, in recent years, the extremely limited supply of pine globally has enabled European production to recover to 20 000 tonnes per year. Europe is also a net importer of wild mushrooms and medicinal and aromatic plants.

Regulations surrounding access to resources can be a barrier to investment in non-timber forest products. Land ownership and land use rights may create obstacles for investors. Furthermore, non-timber forest products are often found at the border of different policy domains, in a "no man's land" as far as regulation and strategic political action are concerned. For instance, ad hoc policies separate game from livestock products, forest products from agricultural products, and so on. Consequently, certain products are included or excluded from a given policy or regulation, and this has created gaps and grey areas in strategic policies such as the farm-to-fork strategy, the Common Agriculture Policy and related rural development measures.

Compared with the timber industry, there is also a lack of knowledge and awareness about the opportunities and challenges of non-timber forest products. In addition, the fragmentation of processing enterprises and the absence of a well-developed value chain for most non-timber forest products can make it difficult to market and sell these products on national and international markets. Adding to the challenges is the fact that some non-timber forest products such as cork or mushrooms may require complex harvesting, transformation and transportation processes, resulting in higher production costs than traditional products when setting up specific infrastructure for their collection, storage and processing. These factors, combined with the relatively small and unstable nature of markets for non-timber forest products creates uncertainty and discourages investors.

For some non-timber forest products (for example, mushrooms, truffles, aromatics or wild berries), grey markets are a major constraint, as processing companies may find it difficult to determine the origin of the raw material. Legal requirements for harvesting (licences, permits, leases, technical specifications), as well as requirements and conditions for marketing harvested material, including traceability and taxation rights, are frequently unregulated. Furthermore, tax and labour regimes are generally not well adapted to primary production activities of non-timber forest products and to the seasonal and complementary nature of their harvesting income, hampering the integration of these activities into the formal economy and holding back investment.

In Spain, to alleviate some of these barriers, the national forestry law of 2003 clarified that mushrooms are "fruits of the Earth" and therefore the property of the owners, if they wish to declare and protect them as such. This

[12] For example, CGAR 2023-31: cork 5.8%, tannins 5.9%, mushrooms 8.2%.

enables private and public owners to determine who may harvest, in what quantities and under what circumstances (authorisation, communication). Based on this framework regulation, the Castilla y León region introduced a mushroom-picking permit system in 2003 to regulate the wild mycological resource in the region. The system was widely accepted on a voluntary basis and eventually officially recognised by Decree 31/2017. Over 700 000 ha of forest have been grouped into mushroom management units and approximately 100 000 picking permits are sold each year, at an average price of €6 per weekend. A further 5 000 permits have a commercial vocation, enabling pickers to sell their harvest on markets, while 25 local processing companies collectively manage the "*Setas de Castilla y León*" quality label. Forest owners — mainly municipalities — devote the bulk of permit revenues (approximately €750 000 per year) to maintenance, promotion and research, since the main aim of the system is to generate tourism rather than direct income.

Case study 2: The Finnish Forest Act 2014, an example of the consequences of removing certain regulatory barriers to forestry investment in Finland.

Before 2014, Finland had a strict forest management policy based on the obligation to follow an even-aged high forest management regime, followed by clear-cutting. These criteria were based on the idea that this process mimics the natural dynamics of the boreal ecosystem (natural regeneration after periodic fires) and aimed to maximise the volume of wood during a rotation cycle (typically 70 to 90 years). The policy was also justified by the state of degradation of the resource and the decline in productivity during the first five decades of the 20th century. However, subsequent research revealed that the ecological dynamics of boreal forests are more diverse than previously imagined. Consequently — and to give forest owners the opportunity to develop other types of management — a new Forest Act came into force in 2014.[13]

The new Forest Act eliminates all restrictions on tree age and diameter required for harvesting. In addition, there is no reference to the type of regeneration felling. Therefore, the act authorises selective felling, uneven-aged high forests and various other forms of management long practised elsewhere in Europe (for example, "*futaies jardinées*" in France or "*Plentern/Felmern*" in Germany). In particular, the Forest Act now allows thinning of the upper forest stand layers, that is, removing the largest, thickest trees in the stand rather than the smallest and weakest as was previously the case. This increases the profitability of thinning operations, in exchange for a reduction in the value of the forest after thinning, as the forest then requires a longer rotation period before final harvesting. It is estimated that this measure can increase forestry revenues by 70% to 80%. The measure has been very well received by industry and forest owner associations.

The new forestry policy also facilitates the expansion of legal forest stands, which were previously based on forest structure and historical interventions. This expansion, combined with abolishing the minimum age or size of trees for final harvesting, means larger stands can now be harvested, increasing economies of scale and reducing overall harvesting costs.

In addition, the period during which a new stand must be successfully regenerated has been extended, and soil preparation requirements have been relaxed to facilitate natural regeneration. It is no longer mandatory to reforest peatlands after clear-cutting an existing stand. This makes harvesting more attractive and may facilitate naturalisation of these peatlands. This measure could potentially concern 1.4 million ha. In the first year of application, some 10 000 ha of forests cultivated on peatlands were harvested, although it is unclear how many of these were allowed to regenerate naturally.

The new forestry law represents a revolution for Finnish forestry. Increasing tree age and species heterogeneity and promoting natural regeneration results in uneven-aged high forest structures that have a positive impact on biodiversity. Since 2014, an increasing proportion of landowners have switched to natural regeneration to avoid the costs of assisted regeneration. Forest owners motivated by an investment rationale rather than by a quality forest production rationale have also shown interest in natural regeneration, which leads to more uncertain results but enables diversification of forest asset portfolios. The strong response of forest owners in adopting new management practices that increase net income has contributed to the sharp increase in domestic felling in Finland in recent years, particularly over the past year as part of the country's efforts to replace wood imports from Russia.

[13] Finnish Forest Act (1093/1996; amendments up to 567/2014 included).

Case study 3: Barriers to investment in voluntary forest carbon projects in Europe

Forest carbon sequestration projects for the production of voluntary carbon credits have become a vital tool for climate change mitigation in recent years. According to McKinsey,[14] the voluntary carbon market is set to grow 15-fold by 2030 and 100-fold by 2050. The development of carbon sequestration projects in forests, if accompanied by the production of environmental co-benefits, represents an opportunity to achieve the EU's objectives for nature restoration (particularly on degraded land) and biodiversity, which often lack sustainable business models. However, for this to happen, the development of this market — and more generally of all the ecosystem services provided by forests — requires investment in sustainably managed forests. These investments face the same obstacles as wood production projects in forests, in particular long payback periods, fragmentation of ownership and the small size of forestry operations. Nevertheless, revenue from carbon sequestration can be a recurring source of income, unlike wood, and can therefore help reduce the costs of forest management. The long-term result would be better managed, more resilient forests that are less prone to fire.

Access to financing for carbon projects can be a barrier to investment. Financial institutions may lack the skills and tools to assess the risks and returns of these projects and structure investments appropriately. This is due partly to the complexity of the indicators that need to be considered and partly to the difficulty of finding and training appropriate personnel.

There is also considerable uncertainty about the regulations governing the use of voluntary carbon credits in carbon offset schemes, which may be subject to regulatory changes and uncertainties about their future value, deterring investors.

Another financial barrier to investment is the high initial costs and long implementation times of carbon projects, due to the effort required to design, develop and structure such projects. This results in unfavourable returns, as relatively high costs are incurred from the outset and the operational (and revenue-generating) phase of the project occurs much later.

Finally, forest carbon projects often have other characteristics that act as barriers to investment, such as being located in remote rural locations and relying on entrepreneurs or small and medium enterprises with limited track records. Furthermore, the risks (perceived or real) of negative social impacts and protests from local stakeholders are high for any project operating in the forest land sector, especially when it comes to single-species plantations, which may be the case in forest carbon projects.

Case study 4: Investment barriers in private forestry in Romania and the EIB's contribution

Private forestry in Romania is highly fragmented, with some 830 000 private forest owners possessing a total of approximately 1.5 million ha of forest. Most of these properties have the legal status of undivided common property of the local community, with no land registry, making ownership unprofitable and management very difficult. Consequently, most of these forests are poorly managed or not actively managed, which is exacerbated by the owners' lack of capacity and technical skills. Some 400 000 ha of privately-owned forest remain unmanaged, raising serious concerns about sub-optimal forest management and illegal logging activities.

In this context, the EIB has invested in a forestry project in Romania to enhance the current management regime of approximately 3 000 ha towards closer-to-nature forest management practices[15]. The project aims to address market failures regarding public goods and externalities, which have led to an undervaluation of forest products and services, and to extend the application of international best practices in forest management to a larger scale than the reference situation, thus demonstrating the socioeconomic and environmental benefits of sustainable forest management. In the context of the long-term rotation cycle of forests and the consequent need for long-term financing, the duration of the EIB loan exceeds the terms available on national financial markets and is better suited to the lifespan of forestry projects. EIB financing also acted as a market signal, helping to unlock additional financing from private and public investors in the field of sustainable forest management. Without EIB support, the project's environmental and climate benefits, as well as its contribution to a sustainable and circular forest bioeconomy, would not have been achieved to the same extent. Forestry assets remaining outside the investment reserve would have likely been managed according to companies' usual practices and standards, not

[14] Carbon credits: Scaling voluntary markets | McKinsey.
[15] ROMANIA FOREST REGENERATION-SLB (NCFF) (eib.org).

all of which are fully aligned with the most recent developments in EU forestry policy in terms of closer-to-nature forest management, enhanced ecosystem services and biodiversity conservation.

Case study 5: The EIB's contribution to overcoming barriers to investment in the research and development of new wood-based products for the bioeconomy.

R&D investment in new wood-derived chemicals faces significant regulatory uncertainty and increased competition from established products such as petrochemicals, which are widely used in many industrial sectors. Moreover, the R&D process can be lengthy, sometimes taking years, before developing a marketable product and research companies may find it difficult to transfer the results of their R&D work to industry, which can slow the adoption of new technologies.

To alleviate some of these barriers, the EIB is participating in an investment project that forms part of a large investment programme by Latvijas Finnieris, a plywood manufacturer based in Latvia. The first component of the project specifically includes the promoter's R&D activities in the fields of birch-derived chemicals (betulin from bark), research into resins and glues (a natural substitute for fossil-based resins), the development of composite plywood for industry and construction aimed at increasing functionality, and the development of wood-plastic composite covering materials (for example, for cladding and decking).

This project helps to remove the financial barrier to investment by lending over a period that exceeds the duration of loans available on national financial markets. The project also helps remove barriers to investment linked to market size by facilitating smaller economic players to gain or retain market share, thereby increasing competition and/or addressing financial constraints arising from information asymmetries due to the lack of track record for these companies and high selection costs for small investments. Finally, the R&D portion of the project also generates knowledge and wider benefits for society as a whole, making a broader contribution to reducing barriers to investment linked to the constraints of public promoters.

Commercial power purchase agreements

Summary

Investment Barriers	
Regulation	
Regulatory uncertainty	X
Regulatory fragmentation	
Administrative procedures	X
Market size and structure	
Fragmented market structure	X
Lack of EU-wide standards	X
Public sector promoter constraints	All barriers are related to private sector
Difficulties in coordinating among funding resources	N/A
Weak planning and project preparation capacity	N/A
Budgetary constraints	N/A
Access to finance	
Local and regional public infrastructure providers	N/A
Smaller corporates and SMEs	X

Introduction

Decreasing technology costs over the last two decades have allowed the development and operation of renewable energy projects solely based on market revenues, without the need for public financial support, in some markets. A significant number of onshore wind and solar photovoltaic projects are already developed without subsidies in certain European geographies, while for offshore wind, subsidy-free projects are increasing.

Simultaneously, a rising number of corporates are seeking to "decarbonise" their operations and are looking for credible proof of such decarbonisation to show their customers and shareholders. Long-term PPAs between renewable energy projects and offtakers are an increasingly popular tool to deliver evidence of the "greening" of a company's power consumption, by linking the sourcing of its electricity to the production of a specific renewable energy plant.

Policymakers are interested in commercial PPAs as they see them as a fiscally attractive way to support the renewable energy sector (instead of public support schemes) and increase market efficiency. Renewable energy projects based on commercial PPAs have also become an operational reality for the EIB as well as for commercial lenders.

Long-term commercial PPAs are agreements under which an electricity generator (that is, a project promoter) sells its electricity production to an energy utility or a corporate end user over an extended period of time (typically >10 years). Commercial PPAs can be concluded on a project level or a portfolio level and can be physical or financial in nature. Although such PPAs come in different forms and structures, a shared feature is that they hedge (a share of) the long-term market (price) risk of both parties. Commercial PPAs should be distinguished from government PPAs under which a government entity offers financial support to renewable energy projects (for example, contract-for-differences, feed-in tariff).

Commercial PPAs are an important tool for de-risking projects (or project portfolios), and are therefore often central to investment decisions. PPAs are typically a key requirement for non-recourse finance structures of unsubsidised renewable energy projects. The EIB has financed several non-recourse finance projects that were based on commercial PPAs.

The EIB has undertaken and published two market studies on the European PPA market.[16] [17] While PPAs have been used for decades by dispatchable generators (such as thermal and hydro), they are a relatively new phenomenon in the renewable energy sector.

The rise of commercial PPAs is linked to the improving economics of renewable energy projects over the last few years. However, the increasing number of active corporate end users in the market has also had a significant impact. From 2014 to 2020, the number of PPA transactions involving corporates increased by more than four times. Corporate end users regularly report that their motivation to enter into renewable energy PPAs stems from their intention to "green" their energy consumption. In this context, "additionality" — the ambition to trigger additional renewable energy investments — plays a crucial role. Such additionality provides the main reason — despite a potential commercial hedging rationale — for entering into a long-term PPA compared with shorter-term contracts or the purchase of "guarantees of origin.".[18]

The Renewable Energy Directive[19] establishes a framework for the promotion of renewable energies in the EU. It sets a binding renewable energy target of 32% in 2030.[20] As part of the EU Green Deal legislative package (Fit for 55), a revised directive[21] entered into force on 20 November 2023, increasing the binding renewable energy target to at least 42.5% by 2030 but aiming for 45%. Government support will continue to play a key role for the majority of renewable energy projects. However, further decreases in technology costs and an increasing demand among corporates for green electricity support the development of a sizeable market for commercial PPAs.

The commercial PPA market size depends on market fundamentals and project economics (renewable energy costs, electricity market prices), government support, merchant risk appetite and offtaker demand. All these parameters are highly uncertain:

- Demand for PPAs: Appetite among offtakers is estimated to be between 150 TWh and 290 TWh — depending on the industry's ambition to green their operations. The lower bound assumes limited additional demand from offtakers beyond large, listed organisations publicly committed to procuring renewables, whereas the upper bound assumes more participation by large energy users who have the appropriate footprint (size, energy consumption) to consider PPAs.
- Supply of PPAs: The requirement of generators for PPAs depends on the availability of government support and their merchant risk appetite. If both elements are strong, generators require approximately 140 TWh of renewable generation to be under commercial PPAs by 2030. This would likely be met by offtakers. If government support is relaxed, and generators have less merchant appetite, up to 480 TWh would require PPAs by 2030. In this case, the market would be constrained by corporate appetite for PPAs.

Addressing the obstacles of the commercial PPA market has also been recognised in the context of the EU's Renewable Energy Directive, and the guidance and recommendation on commercial PPAs[22] published as part of the REPowerEU plan. The REPowerEU plan states that Member States shall assess and remove regulatory and administrative barriers to long-term commercial PPAs and shall describe in their national energy and climate plans how they will facilitate more use of commercial PPAs. Furthermore, the REPowerEU communication includes specific recommendations to Member States to facilitate commercial PPAs, in particular for small and medium-size enterprises, by removing administrative or market barriers and designing support schemes that are compatible with, and enable, commercial PPA.

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16 A Market Study including an assessment of potential financial instrument to support renewable energy Commercial Power Purchase Agreements (https://advisory.eib.org/publications/attachments/commercial-power-purchase-agreements.pdf).

17 Developing potential financial instruments and advisory solutions to stimulate more investment in renewable energy generation by means of commercial power purchase agreements: (https://advisory.eib.org/publications/attachments/developing-potential-financial-instruments-and-advisory-solutions-to-stimulate-more-investment-in-renewable-energy-generation-by-means-of-commercial-power-purchase-agreements.pdf).

18 Guarantees of Origin (GO) are a tracking instrument labelling electricity from renewable sources to provide information to electricity customers on the source of their energy. GO are defined in the revised Renewable Energy Directive RED II (2018/2001).

19 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG

20 The target refers to the overall share of energy from renewable sources relative to gross final energy consumption.

21 https://eur-lex.europa.eu/eli/dir/2023/2413/oj

22 Guidance to Member States on good practices to speed up permit-granting procedures for renewable energy projects and on facilitating Power Purchase Agreements https://eur-lex.europa.eu/legal-ontent/EN/TXT/?uri=PI_COM:C(2022)3219.

Investment barriers

The commercial PPA market remains an instrument for a relatively small number of corporate buyers, due to the associated complexities and counterparty risk requirements. Demand for commercial PPAs from offtakers continues to be constrained by investment barriers like regulation to be implemented, the small number of offtakers creditworthy enough to be accepted as commercial PPA counterparts, difficulties in managing the power price risk exposures, and the challenges deriving from the longer-term nature of commercial PPA contracts.

1. Regulation

Regulatory barriers have been largely addressed by the European Union's Clean Energy for all Europeans package, which was completed in 2019 but still has to be completely transposed into national law by some Member States.[23] The EIB's experience relates mainly to projects with commercial PPAs in place or in negotiation.

- **Regulatory uncertainty**

Public support schemes should be designed in a way that is supportive and complementary to the development of renewable energy projects under commercial PPAs. Some support schemes were incompatible or competed with commercial PPAs, and/or had limited visibility on their future evolution.

Another barrier that was identified is the lack of predictability regarding the regulated component of electricity prices (grid tariffs and taxes), which reduces the attractiveness of PPAs as a long-term hedging tool for electricity price volatility (considering that these regulated components are a significant part of the electricity price).

- **Administrative procedures**

Reported barriers[24] included legal constraints preventing direct contracts between generators and offtakers, barriers to signing contracts with more than one supplier, and barriers to the transfer of guarantees of origin certificates to the offtaker. Regarding cross-border commercial PPAs, administrative barriers associated with guarantees of origin, where the rules for the issuance, use and cancellation of guarantees of origin are not entirely harmonised across all Member States, were also reported.

2. Market size and structure

- **Fragmented market structure**

Demand side

At present, commercial PPA markets are dominated by large corporate offtakers, such as Amazon, Microsoft, Google or BASF. Large electro-intensive industries are also a crucial segment for commercial renewable energy PPAs. To support the development of the commercial PPA market, and thus stimulate more investment in renewable energy production, it is important to facilitate the access of more stakeholders to such agreements, beyond the larger ones seen in the market today.

Limited price risk appetite among offtakers who see a risk of price declines and face stiff product market competition is a key barrier preventing sectors with tighter margins and intense competition such as heavy industry, infrastructure, and fast-moving consumer goods from contracting most of their demand on long-term commercial PPAs that exceed their natural business cycle. Moreover, the electricity demand of small and medium enterprises is often less predictable, making such businesses reluctant to engage in long-term contracts. The less predictable demand also makes it more difficult and costly to manage imbalances between the renewable project output and corporate demand. Some solutions for small and medium businesses could involve the aggregation of demand over multiple consumers. However, this adds additional costs and complexity to the negotiations of PPAs.

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[23] For example, the Electricity Market Directive requires that in all Member States generators and buyers can contract directly with each other, and that consumers can choose multiple supply contracts. Based on the Renewable Energy Directive, Member States need to provide long-term schedules regarding their public tenders and are required to identify any barriers to corporate PPAs in their National Energy and Climate Plans and put in place measures to facilitate their uptake. (Guidance to Member States on good practices to speed up permit-granting procedures for renewable energy projects and on facilitating Power Purchase Agreements, https://eur-lex.europa.eu/legal-ontent/EN/TXT/?uri=PI_COM:C(2022)3219).

[24] Guidance to Member States on good practices to speed up permit-granting procedures for renewable energy projects and on facilitating Power Purchase Agreements (https://eur-lex.europa.eu/legal-ontent/EN/TXT/?uri=PI_COM:C(2022)3219).

Supply side

Electricity generation of up to 86 TWh of PPAs is expected to come from offshore wind assets over the next decade, where long construction times and the scale of projects add additional barriers to corporates seeking PPAs that they can market as being "additional,", that is, enabling the project to proceed. Large renewable power projects, such as offshore wind farms, sometimes face the challenge of finding sufficient volumes of PPAs ahead of their final investment decisions.

In contrast, small renewable energy projects have limited visibility and limited technical and legal expertise required to negotiate commercial PPAs, and renewable energy communities and citizen energy communities are often too small to sign economically attractive PPAs with large offtakers.

- **Lack of EU-wide standards**

The availability of products to hedge volume, shape, basis, and physical risk, and further standardisation of PPA terms are features of a mature PPA market that less mature markets are lacking. Hedging products become expensive once extended beyond the typical two to three years of wholesale power liquidity in most markets, although evidence from Spain and Sweden, among others, suggests hedging becomes easier as volumes of PPA deals increase.

The complexity of negotiating PPAs acts as a soft barrier, which slows entry into the market by less sophisticated offtakers, who often lack awareness about renewable energy commercial PPAs. Utilities have begun to play a role in offering simplifying structures and acting as aggregators. A degree of standardisation could incentivise smaller corporates to consider commercial PPA solutions; such corporates often lack the technical and legal resources to negotiate a large commercial PPA directly with renewable energy promoters. It is expected that the market will continue to find ways of slowly reducing complexity through platforms and standardisation of terms. In particular, the allocation of risks between producers and offtakers are known take various forms, whereas the long-term track records and appropriateness of the chosen mechanisms are yet to unfold (for example, commercial PPAs with a pay-as-produced structure versus commercial PPAs with pre-defined fixed delivery volumes).

Cross-border commercial PPAs face additional barriers, such as economic risk linked to having supply and demand in different markets (different price developments and tax regimes) and the need to manage cross-border transmission price risk.

3. Access to finance

- **Smaller corporates and small and medium businesses**

The barriers facing the commercial PPA market differ across the EU Member States. However, since commercial PPAs are a way to reduce the investment risk for promoters of renewable energy projects, missing or inadequate credit ratings among potential offtakers is one of the most common constraining factors. Credit worthiness is a major barrier across most sectors, particularly in heavy industry and manufacturing, and in less developed European economies, where many organisations have an appropriate energy footprint for PPAs but are not rated by any major credit rating agency. The limited balance sheet capacity of smaller project promoters to take on long-term debt, merchant risk and the offtaker's credit risk, reduces the capacity of promoters to invest in new renewable energy projects. To finance renewable energy projects backed by commercial PPAs, senior debt providers require a strong credit rating to ensure that the offtakers will be able to meet their long-term obligations and, in turn, consider the project bankable.

The removal of this risk has been demonstrably effective in Norway through the power purchase guarantee scheme provided by the Norwegian Export Credit Guarantee Agency, and more recently in Spain with the support of the Spanish Reserve Fund for Guarantees of Electro-intensive Entities.

Consequently, addressing this access to finance risk, which currently constrains the supply and demand sides, should foster the development of commercial PPA markets, especially for smaller renewable energy project promoters and offtakers.

Conclusions

Some of the investment barriers to commercial PPAs could be addressed through developing dedicated financing and advisory mechanisms to support renewable energy purchase agreements. This could include mechanisms to facilitate better access to renewable energy purchase agreements for new offtakers such as small and medium businesses.

As outlined in a market study by the EIB,[25] two financial instruments could be envisaged to address the credit risk of offtakers and the residual merchant risk for generators:

- An offtaker guarantee instrument to support the demand for commercial PPAs by providing credit risk protection against potential default by offtakers under a commercial PPA. The offtaker would then benefit from a level of long-term power price predictability that commercial PPAs offer. The guarantee would secure a part of the offtaker's payment obligations under the agreement. Such an instrument could benefit stand-alone larger corporate offtakers that are not considered sufficiently credit worthy by project funders, or numerous small offtakers (consortia of offtakers) on an aggregated portfolio basis.
- A subordinated debt instrument that aims to support renewable energy promoters, especially in cases of exposure to merchant tail risk, following the maturity of initial short/medium-term commercial PPAs put in place to secure the financing. This instrument would be conditional on at least having a commercial PPA in place for an initial period and for a minimum volume and would be secured by a pledge on a given volume of energy to be delivered by the generator and a waterfall payment.

These "de-risking" instruments could also benefit from advisory support to further stimulate the market demand for commercial PPAs, especially targeting smaller corporate offtakers. For example, an advisory platform, partly online and with open access, could raise awareness, share best practices, build the capacity of relevant stakeholders and propose standardised approaches to or contracts for the use of commercial PPAs.

Such de-risking instruments, and related advisory support packages, should primarily target mid-sized renewable energy projects, with the aim of promoting the use of commercial PPAs among smaller corporates (or larger corporates with inadequate credit ratings).

Member States could initiate such guarantees to support local banks in their efforts to back commercial PPAs for renewable energy projects.

[25] Developing potential financial instruments and advisory solutions to stimulate more investment in renewable energy generation by means of commercial power purchase agreements (https://advisory.eib.org/publications/attachments/developing-potential-financial-instruments-and-advisory-solutions-to-stimulate-more-investment-in-renewable-energy-generation-by-means-of-commercial-power-purchase-agreements.pdf).

Resilient roads

Summary

Investment Barriers	All EU Member States	Comments
Regulation		
Regulatory uncertainty	X	See below
Regulatory fragmentation	X	See below
Administrative procedures		
Market size and structure		
Lack of EU-wide standards	X	See below
Fragmented market structure	X	See below
Public sector promoter constraints		
Budgetary constraints	X	See below
Difficulties in coordinating among funding resources		
Weak planning and project preparation capacity	X	See below
Access to finance		
Local and regional public infrastructure providers	X	See below
Smaller corporates and SMEs		

Introduction

The economic, social and environmental benefits of transport infrastructure and services are well recognised. Europe is highly dependent on a functional transport infrastructure and any unforeseen disruptions can have serious adverse impacts.

Climate change has brought new challenges to preserving the operational ability of transport systems and a wider perspective on resilience is needed. While the adaptation of transport infrastructure to climate change and its expected effects is a prerequisite for greater resilience, additional approaches are needed to anticipate, absorb, accommodate or recover from the effects of hazardous events induced by a changing climate.

Among all transport systems, the challenges of climate change for the road sector are particularly stark. This is due to the extent of the road network, very high traffic volumes and persistent underinvestment in the maintenance of existing road assets.

The backbone of the EU transport system, the EU motorway network, stretches over 74 500 km. Roads carry more than three-quarters of inland goods and passengers in the European Union (Eurostat[26]). There has been a persistent gap between the need for road infrastructure and the amount invested in it.. In addition, road investment in the European Union has not recovered from the 2008 financial crisis, according to Organisation for Economic Co-operation and Development (OECD) data.

Road networks offer unparalleled flexibility in the event of transport disruptions and are the “mode of last resort” and offer “last mile” access when every other transport solution fails. Roads can make the difference between isolation and access to economic and social opportunities.

Climate change can severely impact road systems, leading to delays, disruptions and permanent damage. Failures in key network sections may result in the blockage of large parts of the transport network, with subsequent cascading negative effects. Road infrastructure managers face more frequent and severe damage to road infrastructure and operations than they did in the previous century. Their main response so far has been to integrate climate change considerations into the design of new, upgraded and rehabilitated assets at the **project level**. However, at the **network level**, targeted systematic responses in the form of resilience enhancement

[26] Directorate-General for Mobility and Transport (European Commission), EU transport in figures. Statistical pocketbook 2021, 2021.

programmes are rare. Spending on adaptation remains symbolic and lags well behind spending on climate mitigation in the European Union.

Adaptation in the transport sector is a priority for the EIB Group, which has set itself ambitious goals for supporting climate action through its operations. The Climate Bank Roadmap outlines how the EIB Group will achieve these goals and ensure the alignment of its operations with the Paris Agreement on climate change. The EIB Climate Adaptation Plan identified five areas of action for enhancing the resilience of transport infrastructure to climate change. It sees climate adaptation as the core component of a wider resilience strategy combining short-term incremental adjustments with long-term transformative changes, both at project and network levels. Resilience extends over the asset life cycle and cannot be properly tackled without an overarching resilience programme strategy. Thus, resilience is strongly connected to asset preservation, rehabilitation and infrastructure security.

This section of the report looks at the main barriers to investment in targeted adaptation and resilience in the EU road sector. The principal barriers are predominantly related to the fragmented regulatory framework, immature markets, lack of capacity at promoter level and difficulties in accessing finance.

Climate adaptation and resilience

Adaptation constitutes "the process of adjustment to actual or expected climate and its effects,", whereas resilience is "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions" (IPCC[27]).

Adaptation is characterised by a set of actions and processes that facilitate adjustment to the impacts of adverse climatic changes. Adaptation can therefore be short- or long-term, incremental or transformative, a single action or a holistic programme, and either reactive or proactive. Resilience is associated with a perspective that advocates system-wide changes, including: (i) a range of solutions to enhance social, human, natural, physical and financial capacities; (ii) forward-looking and anticipatory planning for long-term capacity building; and (iii) enhancing the ability to absorb shocks and recover from their impacts. Adopting a resilience perspective within climate adaptation projects and policies encourages a shift from short-term, incremental, project-focused and reactive approaches towards long-term, transformative, holistic and forward-looking planning at the network level.

In road transport infrastructure, resilience involves anticipating critical system situations in proactive ways and adapting to severe circumstances to maintain asset operability. In the European Union, physical road resilience has been gradually integrated into road design and maintenance standards used in traditional road rehabilitation and maintenance activities at the country level.

A transport system approach requires a holistic view of the vulnerability of a transport system, which is a function of the potential impact of climate change based on the location of the infrastructure and therefore its exposure and sensitivity to climate change, as well as its adaptive capacity. Considering climate impacts for individual assets, such as a bridge or a road link, is necessary but not sufficient to ensure that the system functions reliably despite climate change. Consequently, efforts to ensure resilience at the project level must be embedded within a strategic approach to infrastructure network planning that considers direct and indirect effects of climate change and climate variability. Identifying components of the transport system that are most vulnerable to climate change impacts (criticality assessment) and increasing the resilience of these components can enhance the overall resilience of the entire road network.

Resilience, which is a key element of a sustainable and quality infrastructure, applies to "normal" usage and "abnormal" pressures such as those stemming from natural hazards associated with climate change.[28] There are four main components to the resilience of a road system: reliability, recovery, resistance and redundancy. Each component requires targeted measures, as part of a systematic response to adaptation challenges. Furthermore, the components show that the physical characteristics of a road and the characteristics of the planning, construction and management of the road influence resilience of the transportation infrastructure.

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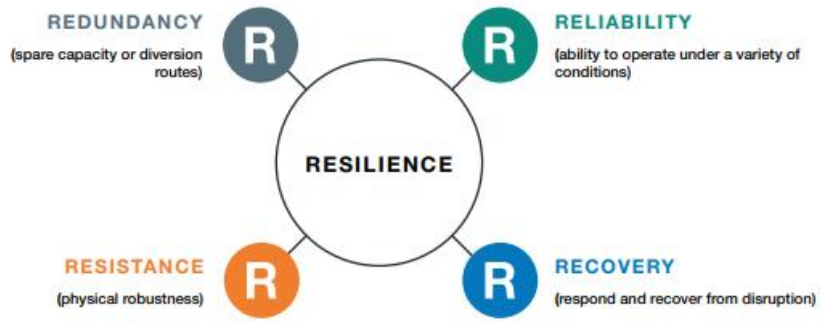
[27] IPCC, 2012: Glossary of terms. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 555-564.

[28] Building Resilience, New Strategies for Strengthening Infrastructure Resilience and Maintenance, OECD 2021.



Source: 'Well managed Highway Infrastructure' code of practice[29]

Climate resilience investments

Investments in adaptation and resilience enhancement ensure the continued usability of an infrastructure asset. Adaptation and resilience solutions are designed to reduce the impacts of current and future climate risks. These solutions span a broad range of investments, from physical infrastructure and new technologies to community-based adaptation and approaches that focus on maintenance planning. Typical physical road infrastructure-specific adaptation and resilience measures include raising roadbeds, building seawalls, adjusting side slopes, using permeable paving surfaces to reduce run-off during heavy rainfall, road drainage, heat-resistant pavements, protected and heightened bridges, and resilient road equipment.

Road climate change adaptation and resilience investments — subsequently referred to as "*road resilience investments*" — can be economically characterised as involving upfront costs and uncertain benefits over a long period. These characteristics make it difficult to quantify, monetise and transfer benefits from users to private operators. Consequently, road resilience is mostly a public sector concern. A resilience investment does not result in cash flows. Accordingly, resilience investments are public sector investments.

Part of the EU road network is operated by private entities under various concession arrangements. Regardless of the payment mechanism (availability or toll-based), the private operator is intrinsically motivated to invest in operational resilience, but only to a limited degree, since the resilience investments create only limited benefits that operators can extract from users. In a quest for maximum life cycle profit, a concessionaire would seek to minimise life cycle costs by undertaking all cost-effective investments in net present value (NPV) terms that would reduce future costs.

This thinking has not yet found grounds in road concessions, partly owning to their long-term nature. One possible reason could be that concession agreements typically include force majeure/extraordinary event clauses, protecting the concessionaire in the event of disruptions caused by extraordinary climate-related events. The expiry of a concession agreement constitutes a rare opportunity for governments to include specific conditions incentivising concessionaires to invest in resilience. Overall, for the reasons described above, private operators cannot be expected to contribute substantially to enhancing the resilience of road networks at this time.

Road resilience investments are typically more cost-efficient than other types of road investment. In addition, they are often perceived as additional costs, even though a climate-adapted design may result in cost optimisation rather than higher costs. Despite the economic rationale, decisions about and investments in the climate resilience of roads are rare. This is because responsible authorities face barriers such as financial constraints, behavioural bias towards the status quo, short decision horizons and the inability to fully capture the value of increased resilience in their budget considerations. Governments face challenges with coordination among various agencies, conflicting interests and evolving policy priorities. Public funding at various levels and financing are subject to political cycles and competition for other uses with more immediate and tangible benefits.

More generally, there is a wide range of barriers to investment, including uncertainty about the future, policy misalignment, the nature of externalities, time horizons, scarce information and capacity. The specific

[29] Reeves, S., Winter, M., Leal, D., and Hewitt, A. (May 2019) Roads: An industry guide to enhancing resilience. Resilience Primer. TRL and Resilience Shift, UK.

investment barriers identified by the EIB during exchanges with national road administrations in several EU Member States and with consultants in road resilience are discussed in the following section.

Investment barriers

1. Regulatory framework

Policy and regulation are key in enabling and promoting climate-resilient road infrastructure investments. Climate change risk assessments and adaptation measures need to be integrated across existing policy processes and decision cycles. Adaptation choices at different levels of governance are often linked, so that a decision at the EU level may enable or constrain adaptation options at a national or local level. Adaptation choices also interact with other policy objectives, creating synergies and trade-offs. It is therefore important to adopt a whole-of-government approach to adaptation planning (OECD[30]).

The regulatory framework for adaptation investments in transport has been evolving gradually based on the long economic life of infrastructure assets and the need for a rational use of scarce public resources. Requirements were set up at multiple levels: performance requirements at policy level and technical requirements at policy implementation level.

At the EU policy level, adaptation and resilience requirements in response to climate change were introduced as conditions for receiving EU grants. For example, the Common Provisions Regulation, which regulates the use of EU funds, put such requirements on European Regional Development Fund and Cohesion Fund grants for *Promoting climate change adaptation, and disaster risk prevention, and resilience*, including the prior availability of a national or regional disaster risk management plan. Such national plans have been under preparation in several Member States since 2022. Similarly, requirements for adaptation to climate change of infrastructure projects funded under the InvestEU Regulation were established in 2021. The European Commission published *"Technical guidance on the climate proofing of infrastructure in the period 2021-2027,"*, to guide promoters in the preparation of investment funding applications. However, use of the guidance and compliance with its requirements is not straightforward and there is a significant lead time for public promoters to apply for and receive EU funds. Furthermore, funds from the European Commission typically support individual transport projects rather than investment programmes.

Two new EU legal acts are expected to provide a solid framework for systematic, network-based resilience assessments and investments.

The Directive on the resilience of critical entities requires EU Member States to (i) identify critical infrastructure through a risk assessment; and (ii) develop a resilience strategy. For critical entities of European significance (critical transport infrastructure sections), a specific oversight regime has been introduced. In the road sector, critical entities are road authorities and operators of Intelligent Transport Systems. Member States have until 17 October 2024 to transpose the Directive and adopt the necessary measures. If implemented thoroughly, the Directive has the potential to drive and reinforce the assessment and planning efforts undertaken by national road authorities.

In its proposal for revision of the Trans-European Transport Network (TEN-T) Regulation,[31] the European Commission acknowledged that the TEN-T network must be resilient to the potential adverse impacts of climate change in order to protect public investments and safeguard their continued usability. Consequently, general requirements regarding infrastructure resilience to climate change were introduced in the revised TEN-T Regulation, which is expected to be approved and published before the end of 2023. With resilience becoming part of the key performance parameters, resilience is expected to receive increased attention from national road administrations and treasuries.

At the national level, road transport infrastructure development, sustainability and adaptation to climate change are addressed by national transport strategies, and in some Member States, by national climate change adaptation plans. Technical standards for design and operation of road infrastructure are set out in national legislation. This contributes to fragmentation and increases regulatory complexity across the European Union.

Some legislative texts lack legal clarity leading to interpretation difficulties. This is the case with the EU Taxonomy Regulation and the subsequent Delegated Acts. For example, the Common Provisions Regulation has adaptation

[30] OECD (2009), Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance, OECD Publishing, Paris, Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance | OECD iLibrary (oecd-ilibrary.org).

[31] Commission proposal of December 2021, COM (2021) 812.

among its objectives, but does not explicitly provide for specific support for transport infrastructure adaptation and resilience.

In addition, regulatory uncertainty and the lack of political action have been reported as barriers to resilience investments for many years, as detailed in the European Environment Agency special report from 2014.[32]

Finally, the absence of examples of best practice, such as programmes supported by EU grants, limits public promoters in the preparation of projects and related grant applications.

In summary, regulatory frameworks at EU and national levels appear fragmented and complex and their future evolution is unclear. The fast-evolving and nascent regulatory environment, its complexity and its lack of legal clarity constitute barriers to investment in road resilience.

2. Market size and structure

Adaptation needs for transport infrastructure represent a significant share of the total estimated adaptation needs in the European Union of up to €500 billion[33] annually. Given the prominence of the road network in a transport system, adapting roads to face climate change and increase their resilience represents a considerable portion of this total investment requirement, possibly in line with the modal share[34] of the road network in transport.

The existing market structure undermines the potential for investment. Market fragmentation and interface issues between different jurisdictions create barriers to investment. In particular, the role of national road administrations in the development, management and financing of potential investment programmes varies considerably between countries and evolves over time. In general, national road administrations are best placed to roll out comprehensive and efficient programmes at the primary network level, but they face numerous constraints and coordination issues relative to regional and municipal sub-networks and corresponding competent authorities.

Very few road resilience projects or programmes have been prepared and the market size for consultancy services is therefore limited. Furthermore, the available consulting services lack standard methodologies and qualified staff. Consequently, a solid business case for this type of investment can be difficult to establish.

The road construction sector is developing suitable technical standards for project preparation and implementation. Two major international standardisation organisations — the European Committee for Standardisation (CEN, Centre Européen de Normalisation) and the International Standards Organisation (ISO) — have been reviewing existing standards to better address climate risk.

- CEN is amending and extending the scope of the European civil engineering technical standards (Eurocodes), with a focus on transport and energy infrastructure, as well as building and construction. They are also amending product standards to account for climate change. Both amendments cover the assessment, re-use and retrofitting of existing infrastructure, as well as the design of new developments (OECD, 2018).
- ISO standards are oriented towards enabling organisations to have their processes certified, by complying with a set of common requirements. The standards also support the setting of priorities and the development and subsequent updating of an adaptation plan. The relevant ISO standards are:
    - ISO 14090:2019 (Adaptation to climate change — Principles, requirements and guidelines) provides a basis for the development of sector-specific standards;
    - ISO 14091:2021 (Adaptation to climate change — Guidelines on vulnerability, impacts and risk assessment) provides standard risk assessment methodologies; and
    - ISO/TS 14092:2020 (Adaptation to climate change — Requirements and guidance on adaptation planning for local governments and communities) supports local governments and communities in adapting to climate change based on vulnerability, impacts and risk assessments.

Despite the potentially positive impacts of these technical standards, they are rarely referenced or mirrored in the strategic technical documents of public promoters. Making relevant technical standards mandatory, through

[32] EEA (2014). Adaptation of transport to climate change in Europe: Challenges and options across transport modes and stakeholders, EEA Report 8/2014.

[33] European Commission (2017). Climate mainstreaming in the EU budget - Preparing for the next MFF: Final report. https://op.europa.eu/en/publication-detail/-/publication/1df19257-aef9-11e7-837e-01aa75ed71a1

[34] No official estimate for the EU road resilience investment needs is currently available.

clauses in contracts for construction, operation and maintenance, could ensure appropriate application of adaptation measures throughout the life cycle of a project.

In summary, the market for road adaptation and resilience to climate change is significant but is currently experiencing market fragmentation and a limited and immature supply of specialised services. There is also an absence of broadly accepted methodological standards for resilience solutions.

3. Public sector promoter constraints

Allocating and managing resources to address climate change resilience is a challenging task. The limited technical capacity of promoters, the scarce supply of highly specialised personnel and the lack of commonly accepted methodologies are some of the critical aspects. The implementation of resilience programmes requires a holistic and multidisciplinary approach, which can increase the risk of technical issues, cost overruns and delays.[35] Successfully enhancing the capacity of national road authorities to address climate change adaptation efficiently is a priority.

Today, various adaptation tools and methodologies are available from different countries and institutes to enhance road resilience for future climate scenarios. Some of these tools and methodologies have been developed in programmes by the Conference of European Directors of Roads (for example, RIMAROCC, SWAMP, ROADAPT[36]). However, these mechanisms rarely cover all the necessary steps, from hazard identification to the final assessment of risk reduction, and the related costs and benefits, including which measures to undertake and when.[37] The integration of adaptation tools and methodologies into everyday working processes remains a challenge for national road authorities.

The monetary evaluation of resilience or robustness in transport systems — such as a road network — is needed to establish a solid business case but remains methodologically challenging because of issues related to the quantification and valuation of benefits. The lack of standard methodologies for determining the economic benefits of increased resilience in transport networks and infrastructure is a hurdle for investment decisions about asset preservation.

As not all costs and benefits can be valued in monetary terms, a hybrid approach combining cost-benefit analysis and non-monetary multicriteria assessment is often used. This further increases the complexity of the assessment and creates the potential for inconsistencies and the risk of double-counting benefits. In addition, the use of multicriteria assessment introduces elements of subjectivity and limits comparability.

Quantifying the costs of climate change and the benefits of increasing resilience is critical for dialogue with governments about long-term plans. Nevertheless, pricing physical climate risk into road infrastructure investment decisions is a global issue and currently represents a systemic failure of governments and markets around the world. Correctly pricing physical climate risk is complex. However, investors, lenders, insurers and rating agencies all require a methodology that can appropriately price climate risk and allow them to make informed financial decisions.

Overall, the complexity of a suitable assessment framework exceeds the capacity of public promoters. On this basis, the EIB established the Climate Adaptation Investment Advisory Platform (ADAPT) in 2021 as part of the EIB Climate Adaptation Plan. This platform aims to facilitate the deployment of technical and financial expertise to address resilience investment and market needs and to accelerate the financing of climate adaptation investments. A few advisory assignments for preparatory works for adaptation investments have been launched through the Joint Assistance to Support Projects in European Regions (JASPERS) an advisory programme run by the European Investment Bank (EIB) and funded by the European Commission and the EIB. So far, interest in advisory services for adaptation in roads available through the ADAPT platform has been limited.

Owing to the limited demand for network-level climate change vulnerability assessment in EU countries, the market offer for services for climate vulnerability assessment and for development of strategic plans and implementation programmes focusing on building adaptive capacity and resilience is underdeveloped. The absence of authoritative methodological frameworks and suitable technical guidance negatively impact the

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[35] Axelsen et al. (2016). Implementing climate change adaptation for European road administrations. *Transportation Research Procedia*, 14, 51-57.

[36] RIMAROCC = Risk Management for Roads in a Changing Climate, SWAMP = Pavements in lowland Areas', ROADAPT = Roads for Today, Adapted for Tomorrow.

[37] Andersson-Sköld, Y., Nordin, L., Rosén, L., Polukarova, M., & Johannesson, M. (2019). Metod och Effektsamband för Identifiering, Bedömning och Prioritering av Åtgärder för Klimatanpassning av Vägar och Järnvägar: En Förstudie. Linköping, Sweden: Swedish National Road and Transport Research Institute, 1-125.

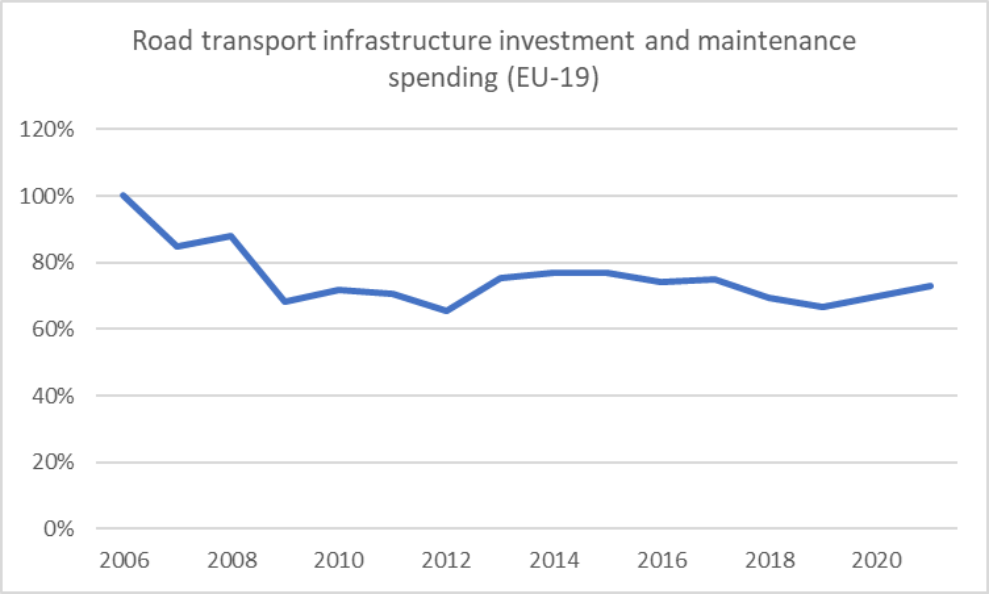
quality of consulting services. Creating solid and stable demand for such services, including standard high-level technical consulting services requirements, would contribute to the development of specialised expertise.

Unlike new construction, or upgrades, resilience enhancement programmes typically fall under the rehabilitation investment category in a state budget and are financed through the annual road maintenance budget. Maintenance is usually budgeted by authorities annually, based on two- or three-year forecast estimates focusing on the most urgent sections or structural elements. This has repercussions on the scale, quality and efficiency of these programmes. Furthermore, since the results of resilience investments are less visible to the public than standard road rehabilitation works, they are often de-prioritised by decision-makers.

In summary, public promoters lack the capacity to develop and execute programmes and strategic policy guidance and face significant budget constraints.

4. Access to finance

Ensuring the resilience of road networks requires significant investment in addition to the transformational investments required to decarbonise the transport system. Investments in resilience and decarbonisation in road transport need to come on top of the regular road investments, for which there has been a persistent investment deficit. Data compiled for 19 EU Member States shows that investment in road infrastructure has not recovered since the 2008 financial crisis.



Source: OECD database (retrieved in May 2023)

There is also a considerable transport maintenance backlog in EU Member States. In the aftermath of the Morandi bridge collapse in Italy, an EIB study[38] estimated the heavy maintenance backlog across the European Union to be approximately €62 billion annually (the backlog of maintenance needs between optimum and actual expenditure in the years 2009 to 2018), with significant differences across countries.[39]

More broadly, in light of the "polycrisis" experienced by the European Union in recent years (COVID-19, the Ukraine war and the resulting energy crisis), there is a need for fiscal consolidation. There is already stiff competition for financial resources, and it is likely to intensify in the future.

For governments and public agencies responsible for the development and operation of the road transport system, access to finance is governed by legislative provisions and state budget plans. Governments may also tap into the EU budget through investment grants or take out loans from multilateral or private lenders.

In several Member States, decision-makers view investment to improve the resilience of existing road infrastructure as part of road maintenance, for which there are specific budgetary and legal provisions in place. These maintenance restrictions often prevent road administrations from taking investment loans to finance relevant investment programmes. For example, some national road administrations cannot borrow by law. The

[38] European Infrastructure Rehabilitation Initiative for Enhanced Safety Study, Atkins 2020.
[39] Note this figure excludes the backlog present in the local road network, which could be more than €77.7 billion.

only financial resources at their disposal come from multiannual state budgetary plans. Consequently, some administrations have turned to public-private partnership schemes as an alternative way of financing road investment programmes.

Involving the private sector in road resilience investments presents its own challenges because concessions and other public-private partnership arrangements typically cover very long periods and offer limited flexibility. On the credit side, governments operate with limited capacity and short electoral cycles, which makes it hard to develop long-term, larger road programmes that attract private investors.

State budgets for road maintenance and rehabilitation are expected to shrink in the future, partly due to reduced fiscal revenues from fossil fuel sales. Governments have therefore been looking for alternative ways to finance and operate road transport systems. Addressing and improving transport system resilience is vital if the sector is to attract finance from a diverse group of investors, including institutional investors such as pension funds, investment funds and insurers. Governments alone cannot cover the costs of creating and maintaining current and future reliable transport systems in the context of evolving risks. In many countries, governments have a limited capacity to fund infrastructure maintenance and upgrades.

Dedicated resilience investments are most needed on existing road networks and should evolve as extensions to standard rehabilitation programmes. However, road maintenance spending in the European Union has been declining for more than a decade in absolute terms. National budgets do not always favour the most effective type of investments, that is, rehabilitation programmes. In addition, road funding is experiencing a shift of budgetary resources away from road infrastructure towards more environmentally sustainable transport infrastructure. This development further reduces the fiscal space available for rehabilitation and hence for resilience.

Considering the existing road maintenance gaps in most EU countries[40] and the urgency of climate change adaptation action for road networks, the use of dedicated network-wide programmes to address deteriorating road conditions while enhancing adaptation and resilience appears to be the most efficient approach. Securing the necessary budget volume over multiple years and making eligible investment proposals are real challenges. There are also no specific public incentives to support this type of investment at the EU level.

One possible way to overcome these hurdles may be to adjust programme objectives and scope, to ensure that large national strategic programmes will be categorised as fiscal investments and therefore may gain access to other sources of finance, such as EU grants and EIB loans. Enabling promoters to tap into various EU funds and schemes for resilience investments could be instrumental in securing the necessary funding from national budgets and for incentivising this type of investment in Member States.

In summary, there is a high level of competition for public resources. Resilience investments appear to have limited eligibility under national investment budgets. Designing resilience programmes so that they can be classified separately from maintenance is a prerequisite for enabling investment in the climate resilience of road networks in Member States.

Conclusions

Increasing the resilience of road transport infrastructure is essential to ensure that transport systems adapt to the shifting risk landscape. Hard and soft resilience measures, aligned with risk transfer options for residual risks, will reduce exposure, unlock capital and ultimately reduce cost — and ensure the resilience of tomorrow's transport systems.

However, investment in climate change adaptation and infrastructure resilience continue to lag behind investment in climate change mitigation, as they require considerable budgetary resources and expertise.

To address the scale of the transport sector's investment needs for climate change adaptation and resilience, investments should be undertaken on a large scale, in the form of national transport network resilience enhancement programmes, with road networks at the core. The main enablers for developing such programmes are improved regulatory guidance, public sector funding, standard methodologies and public grants. Pilot programmes enabled by EU financial incentives could be instrumental in developing examples that could be replicated by other promoters.

[40] The EU core road network: shorter travel times but network not yet fully functional (europa.eu) (2020), ECA 2020.

Antimicrobial resistance

Summary

Investment Barriers	EU	Comments
Regulation		
Regulatory uncertainty	-	Solid and reliable regulatory framework within the EU
Regulatory fragmentation	X	See below
Administrative procedures	X	See below
Market size and structure		
Lack of EU-wide standards	-	Solid and reliable standard framework within the EU
Fragmented market structure	X	See below
Public sector promoter constraints		
Budgetary constraints	X	See below
Difficulties in coordinating among funding resources	-	Health sector mainly financed through public budget
Weak planning and project preparation capacity	-	No impact in relation to antimicrobial resistance
Access to finance		
Local and regional public infrastructure providers	-	Health sector mainly financed through public budget
Smaller corporates and SMEs	X	See below

Introduction

Antimicrobial resistance occurs when a pathogen changes and becomes resistant to the antimicrobial treatments, especially antibiotics, used to combat the diseases that they cause. Antimicrobial resistance directly impacts human and animal health and carries a heavy economic burden because of the high treatment costs and reduced productivity caused by sickness. Globally, antimicrobial resistance is responsible for an estimated 700 000 deaths per year, a figure that some scenarios predict could rise to over 10 million deaths by 2050.[41] **Antimicrobial resistance is estimated to cost the European Union €1.5 billion per year** in healthcare costs and productivity losses.[42]

Antimicrobial resistance threatens health advancements made by modern medicine, as routine medical procedures may become impossible to perform due to the risk of untreatable, life-threatening infections. Prophylactic antibiotic use is an essential part of standard surgical protocols, including for intubated patients. Hence, with the high number of intubated and ventilated patients during the COVID-19 pandemic, an increase in the use of antibiotics, especially broad-spectrum antibiotics, was observed, which could ultimately lead to increased resistance. Furthermore, antimicrobial resistance played a pivotal role in the COVID-19 crisis, as a significant number of fatalities involved patients that had contracted secondary bacterial infections, which may have been the ultimate cause of death. There were also indications of an increase in resistant bacterial infections such as MRSA (methicillin-resistant *Staphylococcus aureus*) in hospitals during the outbreak. This is extremely concerning given that 39% of the antimicrobial resistance disease burden in Europe is **caused by bacteria resistant to last-line antibiotics**.[43]

41 The staggering death toll of drug-resistant bacteria (nature.com).
42 Data on antimicrobial resistance (europa.eu).
43 33000 people die every year due to infections with antibiotic-resistant bacteria (europa.eu).

New antimicrobials are therefore urgently needed to address the problem. However, the market for antimicrobial resistance products has various deficiencies. Uptake of antibacterial treatments is slow as new products are reserved for drug-resistant infections to preserve their effectiveness — precisely to limit the problem of antimicrobial resistance. Consequently, the traditional reimbursement model that underpins the commercial value of assets — where revenues are generated based on volumes sold — is completely unfit for purpose, **rendering novel solutions undervalued in comparison to the benefits they bring to society**. This generates a negative incentive for developers and suppliers of such products and its impact reaches across the value chain, **lowering the appeal of research, development and innovation activities in the sector**. Investment in antimicrobial resistance has contracted significantly in recent decades, as pharmaceutical companies and researchers have turned their attention to more lucrative markets such as oncology and rare diseases. Market-based reforms are therefore critical to create a commercial environment that promotes sustainable investment into antimicrobial and antibiotic research, development and commercialisation.

To analyse the general context of the four topic areas defined in the summary table above and the barriers to investing in antimicrobial resistance, this section focuses on two major components, namely:

i. **Research, development and innovation**: these activities are performed to push the boundaries in the fight against infectious diseases, and involve the discovery and development of novel chemical or biological entities, molecular pathways, systems and processes, etc. The activities are aimed at creating new products and/or processes in the fields of diagnostics, therapeutics and preventive measures (such as vaccines), and are conducted by both public and private entities (for example, academic and public research centres, private startups and established large pharmaceutical companies).

ii. **Manufacturing and commercialisation**: these activities are related to the provision of medical and medicinal products in the fight against antimicrobial resistance (for example, diagnostic kits, antibiotics, etc.) in the health system, in order to reach affected patients. The focus is oriented towards activities conducted by **private entities**, as the established installed manufacturing base is almost entirely private in the EU, and commercial and distribution activities are usually performed by medium or large diagnostics and/or pharmaceutical and distribution companies with capillary networks across and within countries.

Investment barriers

1. Regulation

- **Regulatory fragmentation**
- **Administrative procedures**

The EU single market and the presence of regulatory agencies (such as the European Medicines Agency, the European Patent Office, etc.) and standards (such as Good Manufacturing Practices, Good Distribution Practices, etc.) creates a level playing field for the healthcare industry from a regulatory perspective, with limited barriers to investment due to regulatory uncertainty. This is important in the first steps of the value chain, as **R&D activities are only marginally affected by differences in regulatory contexts**.

However, **differences in the healthcare systems** of Member States, which each have their own defined priorities, protocols and specific procedures, generates a **scattered environment** that can represent a barrier to investment in the sector. Moreover, resistance to reforms and to priority changes, as well as **interference** in the governance and autonomy of healthcare providers at regional and local levels (being large employers and purchasers in the local economy) further add to the investment barriers. Lastly, legislation and regulation are often **lagging behind innovation**: outdated regulations, sanitary restrictions and personnel requirements may further inhibit the implementation of innovative models and information technology solutions, thus reducing the incentives to invest in stronger and more advanced approaches.

Investment barriers related to regulation are **a particular concern for manufacturing and commercialisation activities**. Taking procurement activities for health goods as an example, these activities can be conducted at national level for more centralised systems, and at regional or even local levels for highly decentralised ones. This approach can be advantageous, providing flexibility for specific local purchases and consolidation of larger ones (generating higher negotiation power). However, such approach usually creates a fragmented market, leading to a **challenging environment for counterparts** (for example, suppliers) and requiring additional investment from their side to face such complexity in commercialisation and distribution. In contrast, efficient procurement activities conducted at European level, as evidenced by the advanced purchase agreements for COVID-19 vaccines negotiated by the European Union on behalf of all Member States, have proved to be

extremely relevant and beneficial in specific situations or for specific purchases. A centralised "procurement tower" can lead to optimal one-to-one interactions between the European Union and suppliers, as only limited additional upfront investments are demanded to "virtually negotiate" with 27 countries. Moreover, the broader geographical perimeter covered generates a "smoothing" effect on demand, as buffers can be created and utilised within the system itself, simplifying the planning and execution of manufacturing campaigns. While this model existed before 2020,[44] its broader application could represent a big improvement in the reduction of investment barriers due to procurement activities and regulation.[45]

Manufacturing activities, essentially conducted by private enterprises, are affected by another crucial issue when considering barriers to investment due to regulatory fragmentation and administrative procedures. Contracting arrangements with suppliers are often short-term (annual or bi-annual), making it **challenging for the private sector to establish long-term investment plans**. Rigid and diverse reimbursement scales, complicated systems and adverse pricing decisions stemming from certain administrative procedures also cause over- or under-provision of goods due to distorted incentives, thus biasing over/underinvestment in production. This is compounded by reimbursement or payment scales that are **not cost-covering for suppliers** — a recognised and complex issue in antimicrobial resistance — triggering investment gaps that private providers are unable or uninterested in filling.

Distribution and logistics are also affected by differences across regulations and procedures among Member States, albeit to a lesser extent compared to upstream processes such as manufacturing and commercialisation. The single market and the free flow of goods is a significant enabler for such activities during regular times. However, disruptive events such as the COVID-19 pandemic can **jeopardise the entire distribution network**. As an example, attempts to contain the spread of COVID-19 by using uncoordinated internal border closures and checks in 2020 generated a counterproductive effect that weakened vital distribution chains (such as those for medicines, personal protective equipment, etc.), and temporary export bans on essential supplies only led to further shortages.[46] The resulting additional costs may prevent participants in these processes from adequately considering and establishing efficient and widespread distribution mechanisms, to the detriment of the general services rendered to the wider population.

The reform of EU pharmaceutical legislation and the adoption by the European Commission of a new directive and a new regulation[47] is expected to enhance the availability and security of medicine supplies to patients across the European Union. Moreover, antimicrobial resistance features among the critical priorities to be addressed globally, especially with the World Health Organization's **One Health approach**.[48]

2. Market size and structure

- **Fragmented market structure**

The discovery of antibiotics was one of the most significant medical achievements of the 20th century, with most of the antibiotic classes used today being discovered and brought to market between the 1940s and 1960s. However, due to (i) the creation of generic versions of most of these treatments and (ii) the significant costs of R&D with corresponding limited market uptake, very few novel antimicrobials (and in particular antibiotics) have been developed in recent years.

As previously mentioned, novel antimicrobial treatments are undervalued relative to the benefits they bring to society because their uptake is relatively slow and their use reserved for drug-resistant infections to preserve effectiveness, thus reducing their commercial potential. Within this negative spiral, reimbursement systems based on price-per-treatment-per-patient formulas (that is, linked to volumes) further discourage the investment needed to develop and commercialise novel treatments.

The global antibiotics market was valued at approximately $48 billion in 2022, with modest growth expected in the coming years (compound annual growth rate of about +4% until 2030).[49] This market is considerable but is dwarfed in comparison with those of other therapeutic areas (such as oncology and immunology), despite representing a segment in which almost every human being is confronted with (sometimes multiple times) throughout their life. Moreover, antibiotic use per capita has reached record lows, with 23% of Europeans saying

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44 Signing ceremonies for Joint Procurement Agreement | Public Health (europa.eu).
45 Microsoft Word - 00 EXPH PP opinion APPROVED FINAL FINAL 28042021 plenary.docx (europa.eu).
46 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0380&from=EN.
47 Reform of the EU pharmaceutical legislation - European Commission (europa.eu)
48 Integrated, unifying approach to balance and optimise the health of people, animals and the environment (One Health (who.int)).
49 Antibiotics Market Size, Share and Trends [2023 Report] (grandviewresearch.com).

in 2021 that they have taken oral antibiotics in the past year, the lowest level since 2009 (even if this varies significantly among countries, from 42% in Malta to 15% in Sweden and Germany),[50] with the growth of the market attributed mainly to the rise in cases of infectious diseases, alongside the imbalance of demand-supply.

Furthermore, **differences in the health systems** of Member States, in terms of size, patterns of priorities, services and procedures, generate a relatively fragmented market for products addressing antimicrobial resistance. **Such fragmentation does not directly impact research, development and innovation activities** (carried out in almost all Member States due to the scattered presence of advanced skills and competencies in the sector) but is **critically important for manufacturing and commercialisation activities**.

There is **growing academic, policy and industry agreement that** market-based reforms, including a shift from volume-based reimbursement to a value-based model that relies on outcomes (for example **"pull" incentives** in the form of subscription models, reward mechanisms, etc.), are required to drive sustainable investment in antimicrobial manufacturing and distribution. This is expected to generate cascading positive impacts both on access to treatments and increased research, development and innovation, stimulating a sector that remains among the top priorities in the context of present and future global health threats.

Such incentives have received support in recent reviews and high-level declarations,[51] with some countries **implementing pilot schemes** (for example, Sweden[52] and the United Kingdom[53]) to ensure appropriate compensation for developers, based on payment systems de-linked to prescription volumes. The largest markets (such as the United States and the European Union) are moving in this direction (for example, with the Pasteur Act in the United States and the reform of pharmaceutical legislation in the European Union) and although this paradigm shift is still in its infancy, it is critical as it may have a **significant "corrective" effect on the commercial potential and the valuation of assets**.

3. Public sector promoter constraints

- **Budgetary constraints**

Budgetary constraints are a major investment barrier. As healthcare services are financed by national budgets in the European Union, constraints experienced by the public sector directly impact the provision of public health goods, such as medicines. Health expenditure has outpaced economic growth in recent years and this trend is expected to continue (8.8% of gross domestic product in 2018 in OECD countries on average, reaching 10.9% in 2020 in the EU),[54] while public health budgets are unable to keep pace with these needs. Moreover, this situation is further **accentuated in countries with administratively decentralised** health services, which disperses the decision-making process and affects budgeting, allocation and capacity planning.

In the antimicrobial resistance sector, this is directly translated into the healthcare system **putting downward pressure on prices** (for example, antibiotics) and encouraging the use of generic versions. Although this situation is welcomed as it increases access to medicines even in cases of strict budgetary constraints, it does **hamper the potential profitability of investments** and becomes a deterrent for downstream (manufacturing and commercialisation) and upstream (R&D) activities. Moreover, as highlighted in the previous section on regulatory barriers, budgetary constraints in the form of annual budgets result in limited capacity to engage in multiannual contracts, thus leading to **uncertain (that is, higher) investment costs for manufacturers and distributors**.

4. Access to finance

- **Smaller corporates and small and medium businesses**

The field of antimicrobial resistance is plagued with complexities that are often insurmountable for small businesses and mid-cap firms. The investments required to develop new products and processes are significant, especially considering the attrition rate that is typical in pharmaceutical R&D and the low uptake of new antimicrobials caused by reserving these therapeutics for drug-resistant infections. The consequent undervaluing of novel solutions relative to the benefits they bring to society means that commercial risk is translated into financial risk for small businesses and mid-cap firms, considering the lower and uncertain cash flow associated to such assets. Furthermore, this undervaluation also reduces the opportunity to tap institutional and private investors and the broader debt market, therefore increasing their cost of capital.

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50 Antimicrobial Resistance - November 2022 - Eurobarometer survey (europa.eu).
51 How a subscription payment model could fight antibiotic-resistant superbugs | World Economic Forum (weforum.org).
52 Availability of antibiotics - The Public Health Agency of Sweden (folkhalsomyndigheten.se).
53 NHS England » Antimicrobial resistance (AMR).
54 2022_healthatglance_rep_en_0.pdf (europa.eu)

This financial risk explains why most large pharmaceutical companies (which conduct research, development, manufacturing and commercialisation activities and serve as traditional biotech co-development partners) have **exited this space completely or significantly reduced activity** over recent decades, and the **venture capital market for biotech companies targeting antimicrobial resistance has stalled**, especially in financing late-stage (more expensive) development. As a result, **biotech companies active in the space are unable to find co-development partners and/or raise adequate capital** to finance costly clinical development and ramp-up commercialisation.[55]

This situation results in a double negative loop: on one side, there is depletion of the pipeline of new antimicrobials and the increasing threat of antimicrobial resistance, and on the other side, there is loss of valuable development expertise, skills and resources, as **scientists in the field switch to other specialties**, considering the limited career prospects (and profitability for companies).

Over the past few years, different partners have joined forces (notably from high-income countries) to develop funding programmes aimed at providing a lifeline to struggling corporates and small and medium businesses engaged in the fight against antimicrobial resistance. The World Health Organization, the Wellcome Trust, the Global Antibiotic Research & Development Partnership, the European Union and several agencies around the world have established programmes to **support research, development and innovation targeting antimicrobial resistance through different financing schemes**, from grants to equity and debt support. The EIB has also been at the forefront in engaging with the sector, at first through the InnovFin mandate from the European Commission,[56] then with its participation in the creation and structuring of the AMR Action Fund[57] and now with the HERA Invest mandate, [58] providing patient capital to promising companies in alignment with their business plans.

Conclusions

Antimicrobial resistance is currently one of the biggest healthcare challenges globally. The low investments in the sector over the past decades contributed to the dramatic drop in outputs from research, development and innovation activities, which created a situation, characterised by fewer and fewer tools available, expected to persist also in the near future.

For this reason, multiple **international organisations have tried to stimulate again the sector** over the last few years. Policy reforms, market interventions and additional financing mechanisms have been put in place to contrast this deadly threat and provide adequate, accessible and affordable products (such as treatments).

Looking beyond research, development and innovation, **financial support for small corporates and small and medium businesses is still needed for manufacturing and commercialisation** activities, which are very costly. Additional funding to the sector, especially for late-stage activities remains critical, coupled with the solutions identified in the previous points (that is, centralised procurement schemes to address regulatory challenges, and new reimbursement mechanisms to correct market imbalances).

Only through a concerted approach among different stakeholders at a global scale can humanity seriously tackle the problem of antimicrobial resistance.

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55 The 2019 bankruptcy of Achaogen (a company once valued with a $1 billion market capitalisation that received over $200 million in public funding, but was liquidated for $16 million) less than a year after FDA approval of a priority antibiotic, and similar cases with Melinta, Aradigm and Tetraphase a few months later, underscore the commercial challenges of the antibacterial treatment market and the limitations of existing early-stage push incentives like those provided by CARB-X and the Novo REPAIR Impact Fund.

56 Legacy mandates (eib.org)

57 Antimicrobial Resistance Research & Development - AMR Action Fund

58 Funding and opportunities - European Commission (europa.eu)

Cross-border projects

Introduction

Cross-border infrastructure projects are fixed-asset investments that physically link two or more countries via infrastructure, including digital infrastructure, and enable the flow of people, goods, commodities or data.

A key factor that differentiates cross-border infrastructure projects from typical projects within a single country is their scale and complexity, as they often span difficult terrain across borders, such as rivers, mountains or oceans, which represent significant physical barriers. Such projects are complicated, risky and costly, since they require large upfront capital investments. Moreover, because they involve two or more countries, cross-border infrastructure projects face a more complex regulatory environment, requiring coordination between many stakeholders and the support of at least two governments. As a result, cross-border infrastructure projects tend not to be national priorities. They also frequently suffer from lead times that are on average twice as long as for typical projects within national borders and they often experience cost increases.

Most cross-border infrastructure investment projects are public and regulated investments that the EIB can support, as long as they are economically viable and comply with the Bank's procurement, environmental, social and climate requirements. Between 2010 and 2022, the EIB approved and signed approximately €20 billion in loans for 105 cross-border infrastructure projects globally, supporting total investment of around €60 billion. More than half of these cross-border projects involved two or more EU Member States.

This high volume of transactions demonstrates the extensive experience of the EIB in financing cross-border projects both within the European Union and between the European Union and its neighbours, as well between countries outside the European Union. Besides supplying direct financing and mobilising private sector funding, the EIB also provides technical advice and collaborates with the European Commission in shaping policy initiatives that encourage sound cross-border projects.

Cross-border infrastructure projects are central to completion of the EU single market because they enhance connectivity and reinforce economic and social cohesion.

The flows of people and goods enabled by cross-border transport infrastructure help enhance cross-border movement, extending academic and labour markets and enabling international infrastructure corridors for long-haul traffic. For instance, the experience of the EIB in road infrastructure projects shows that 60-70% of the journeys on roads connecting two countries involve border crossings.

The completion of the EU Energy Union, which is essential for the security and affordability of energy and the energy transition, depends on interconnections to enable energy to flow between Member States. Appropriate levels of interconnectivity ensure the efficient use and sharing of cross-border resources in both gas and electricity. In the case of gas, interconnectivity has long been critical to ensuring the security of supply to Member States, particularly in regions that were historically dependent on a single supplier. New import and transit capacity has reduced gas price spreads and improved the diversity of supplies, especially since 2014, when the European Union introduced the Energy Security Strategy to tackle the dependence of some Member States on Russian oil and gas. In the electricity market, interconnectors provide flexibility that enhances energy security and helps to manage variable-output renewables like wind and solar, thus allowing for the integration of greater shares in the generation mix.

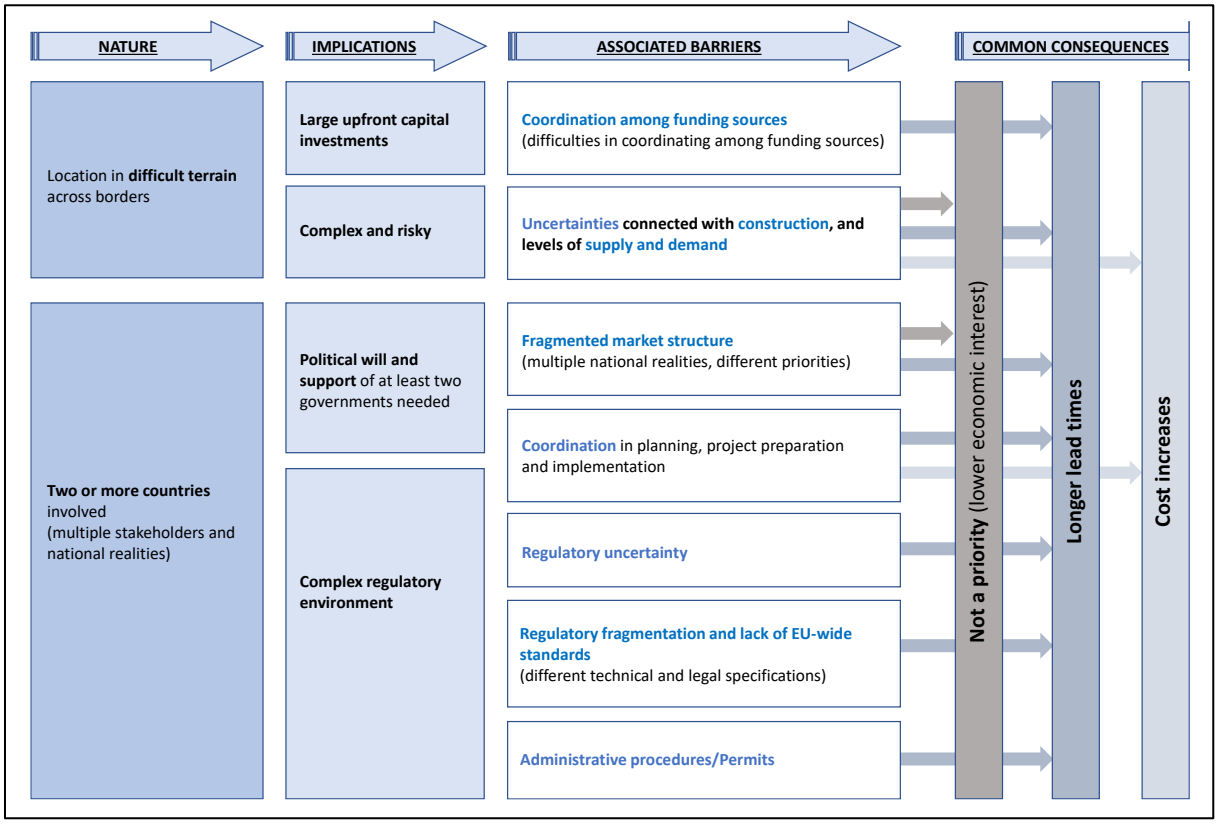
The exchanges of data through digital infrastructure foster collaboration and stimulate innovation across borders, ultimately enabling the transition to a global, digital economy, with positive effects on economic growth, security, the environment, the integration of marginalised communities, and societal development. Deploying digital networks and interconnecting through digital services is a factor in international, regional and local integration across sectors.

Investment barriers

This section looks at the common barriers and challenges facing cross-border infrastructure projects. The analysis, summarised in Figure 1, is based on the extensive experience and expertise of the EIB in such projects over the years. The common barriers derive from the nature of cross-border projects, that is, that they involve two or more countries and often involve difficult terrain. These barriers lead to common consequences such as longer lead times and/or cost overruns compared with typical infrastructure projects that take place within a single country. Such barriers may also lead to a lower and more dispersed economic interest linked to an uneven

distribution of the costs and benefits, which can make them a lower priority for one or more of the national governments involved.

Figure 1. Main barriers to the realisation of cross-border infrastructure projects, their causes and consequences



The complexity and high-risk profile of mega-infrastructure projects, including most cross-border projects, means that there are very often uncertainties connected with their construction and the expected levels of supply and demand. In the case of a tunnel, for instance, geological studies are unable to provide complete certainty about the geological characteristics of the terrain to be drilled. Simultaneously, it can be difficult to predict the demand for an unbuilt cross-border infrastructure. In addition, the costs and benefits of a project may be asymmetric, so that one country may incur a higher share of the costs and receive a lower share of the benefits. This generally results in a lower economic interest in cross-border transport projects, which frequently leads to lower prioritisation at the national level. Projects that do progress often continue to experience construction and supply/demand-related uncertainties, resulting in construction delays and cost increases. This does not only happen in the transport sector. For digital interconnectors such as submarine cables, the business case of a single operator is in some cases not viable due to cost uncertainties, and therefore requires the establishment of a joint venture between competitors and/or public intervention for the project to progress. For energy interconnectors, due to the considerable amount of time it takes to develop, plan, licence and then construct an interconnector, an accurate assessment of costs and benefits is difficult because costs may change over time and market fundamentals and benefits may vary (future energy prices and demand are difficult to estimate). Such uncertainty causes further delays when various stakeholders have differing views on market and sector outlooks and do not agree on the desired project outcomes. Cost allocation disputes can then arise that may require the involvement of a supranational entity (for example, the European Union Agency for the Cooperation of Energy Regulators) to take a decision, which may lead to further delays and project redesigns. Some projects are put on hold or become more expensive due to new design solutions and equipment inflation over time, further decreasing their economic interest.

The need for the political backing of multiple governments is another common barrier to the realisation of cross-border infrastructure projects. As previously stated, where a fragmented market structure leads to an asymmetrical distribution between countries in the costs and benefits of a project, there may also be asymmetry

in the level of political prioritisation. In some cases, the cross-border section may be far less significant and subsequently a much lower priority for one country if it is already well interconnected. EU grants (for example, funding from the Connecting Europe Facility programme) mitigate this barrier but do not fully eliminate it. In addition, a fragmented market structure may lead to differing economic interests. For instance, concerns about the evolution of electricity prices may lead certain industries to oppose interconnection if it erodes an existing cost advantage. Even though greater interconnectivity generally implies a net increase in the overall socioeconomic welfare, the variations in prices that follow may negatively affect specific stakeholder groups (for example, price increases for energy-intensive users, or price reductions for energy producers).

The nature of cross-border projects means there is a need for effective and continued regional coordination to facilitate project planning, preparation and implementation, as well as coordination among funding sources. Such coordination is not easy because of the differing regulations and laws and cultural and/or language barriers between participating countries. In addition, weaknesses in project planning and preparation capacity are a problem with some public sector promoters, especially in the transport sector, where there is often a lack of experience in implementing cross-border projects. EU regulations and institutions help create some structure and a collective effort for success, but among some countries outside the European Union, weaknesses in project planning and preparation can be a very significant barrier. For linear cross-border infrastructure projects, such as railways and motorways, difficulties at the project preparation level are especially relevant for greenfield projects, where the alignment of infrastructure needs to be defined (this concerns both the scope of the different approvals and consents, and their validity). For cross-border submarine digital interconnectors, coordination difficulties tend to arise when contracts are due to be signed, as these need to be coordinated with a diverse group of clients in various countries, usually for large sums, and at the same time, in order to meet the cable vendor's conditions to start working on the project. For energy interconnectors, network tariffs are designed at the national level in different ways, which creates further complexity for cross-border trade. Accessing public funds or financing from multilateral development banks to finance cross-border projects is complicated. There are various mandates and, in the European Union, numerous possibilities for combining different EU funding sources. Borrowers also have a diverse range of legal and financial arrangements.

The complex regulatory environment implied from the involvement of two or more countries affects coordination, but also adds regulatory uncertainty, regulatory fragmentation and longer permitting procedures.

Regulatory uncertainty in the transport sector arises from inadequate national frameworks, including a lack of regulations governing cross-border activities. Investment in energy interconnector projects also suffers from a lack of regulation, including regulation governing how two companies should split the costs. The limited regulatory framework that cross-border ancillary services benefit from may restrict opportunities to develop projects in one country to provide services in another.

Regulatory uncertainty is compounded by regulatory fragmentation, which is often associated with a lack of EU-wide standards. The lack of EU-wide standards, or international standards for neighbouring countries, remains a barrier to cross-border infrastructure in sectors such as railways despite ongoing work to harmonise technical parameters across the European Union (for example, through the Railway Interoperability Directive[59]).

In addition to the lack of harmonisation of legal and regulatory frameworks, the complexity of cross-border procurement creates a barrier, as the different governance structures of the public and private entities involved in a project exacerbate problems caused by the lack of common procurement rules for cross-border activities.

Cumbersome border-crossing procedures and permitting issues are also hurdles to cross-border infrastructure investment. Permitting processes may have different durations in each country and uncertain outcomes, resulting in considerable implementation delays. Although the European Union has set streamlined permitting procedures for Projects of Common Interest, delays are still quite frequent.

Conclusions

Deglobalisation trends are expected to lead to a restructuring of trade and supply chains, often around regional markets. As supply chains and markets integrate at a regional level, the demand for more and better connectivity, and thus cross-border infrastructure, is likely to rise.

[59] DIRECTIVE (EU) 2016/797 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 May 2016 on the interoperability of the rail system within the European Union

Although market integration in the European Union is advanced, there are still gaps in cross-border infrastructure. These gaps are even larger in markets bordering the European Union (for example, accession countries), and demand for physical cross-border infrastructure will be even higher in emerging markets. The EU Global Gateway initiative aims to help bridge the infrastructure investment gaps in developing countries, including in cross-border infrastructure.

Sectoral demand for more or better cross-border infrastructure is expected to be lower in the European Union for roads (although there is still some demand beyond maintenance/modernisation) but is likely to be much higher outside the European Union. By contrast, rail connections between Member States still need to be expanded.

In terms of cross-border energy infrastructure, the focus of the next decade will be on expanding the capacity of electricity grids worldwide, but particularly in Europe (predominantly the construction of new high-voltage direct current interconnectors). Repurposed and newly built infrastructure for low-carbon gases is likely to have a slow start in the coming decade, but growth may improve later.

Another area with high expected demand is digital infrastructure, that is, telecommunication networks (mostly fixed-line/fibre-optic) and data centre capacity. The closer integration of the service markets in the European Union means digital infrastructure will require substantially higher investment than today.

Finally, while the EIB remains ready to support the European Commission and EU Member States in their efforts to complete the single market and reinforce economic and social cohesion, some of the biggest barriers and challenges to cross-border infrastructure projects can only be addressed by regulators and governments as they stem from the complex regulatory environment and a lack of political support.

Part 2: EIB Group investment and finance surveys — non-financial corporates and small and medium businesses

The first section in Part 2 reports the results of the annual survey of non-financial corporates on investment and investment financing, namely the 2023 edition of the EIB Investment Survey (EIBIS).[60] By gathering information on firms' investment intentions and perceived investment obstacles, including for the green and digital transition, the survey provides valuable information for the design of policies, including those recommended in the European Semester.

The second section in Part 2 reports on the EIF's analysis of survey results focused on financing conditions of small and medium businesses. This analysis draws on the EIF's SME Access to Finance (ESAF) index as well as various surveys, including the EIF Venture Capital Survey; the EIF Private Equity Mid-Market Survey; and a survey on European microfinance providers. Several **case studies** on skills and education complement this section and illustrate how EIF funding helps to overcome investment barriers.

EIB Investment Survey 2023 (EIBIS)

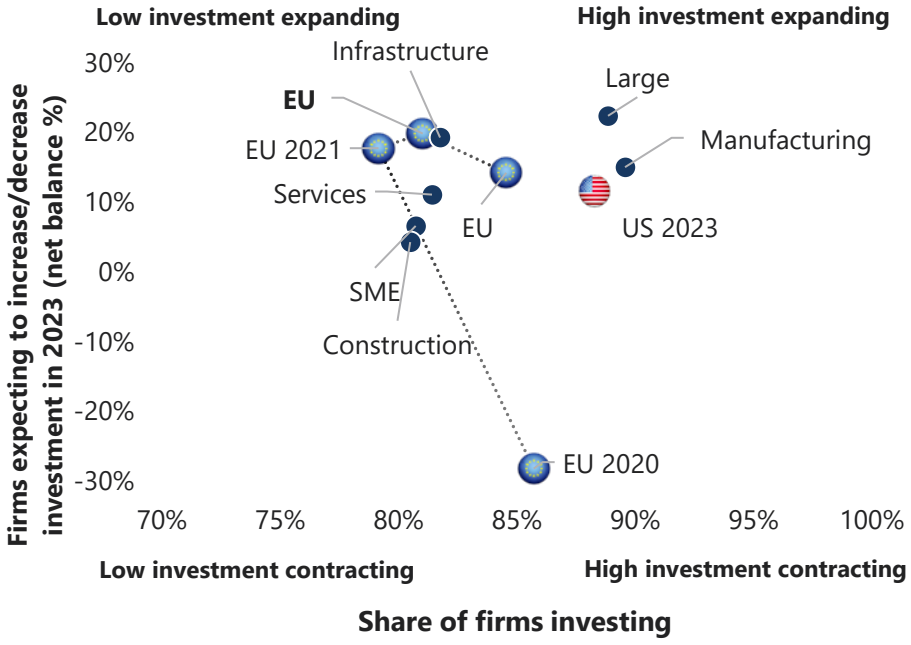
This year, the investment outlook and investment barriers are shaped by high uncertainty and tightening monetary policy. The share of finance-constrained firms is increasing in the European Union and the United States, particularly among small and medium businesses. Among longer-term barriers to investment, those most frequently cited by firms are high uncertainty, a shortage of skilled staff, and, particularly in the EU, high energy costs. Meanwhile, green and digital transitions are continuing on the ground. EU firms have stepped-up investment in advanced digital technologies but must still maximise the return from this investment. In addition, the climate emergency is becoming more pressing. EU firms are also accelerating investment in energy efficiency but need to do more for adaptation, and they face long-term challenges to their global competitiveness, amid persistently higher energy costs versus those of key global competitors (such as the United States).

A bleak short-term outlook for corporate investment

Despite slowing economic growth and tightening monetary policy, in 2023, EU firms remain relatively positive on their investment intentions. About 85% of EU firms report to have invested in the previous year, bringing the share of investing firms back to pre-pandemic levels. In addition, when asked about intentions for the future, a larger share of firms expect to increase rather than decrease investment (Figure 1). This positive picture is overshadowed by slowing economic growth and tightening monetary policy. Firms are relatively negative on several factors underpinning the investment outlook (Figure 2). Overall, they remain negative about the political and regulatory climate and the economic climate. They are, on balance, slightly more positive than negative about developments for business prospects and access to internal finance. In contrast, they expect, in net terms, a deterioration in the outlook for access to external finance. High profits and policy support provided a buffer for firms, protecting investment. As buffers gradually deplete, the tightening of external finance conditions will matter more.

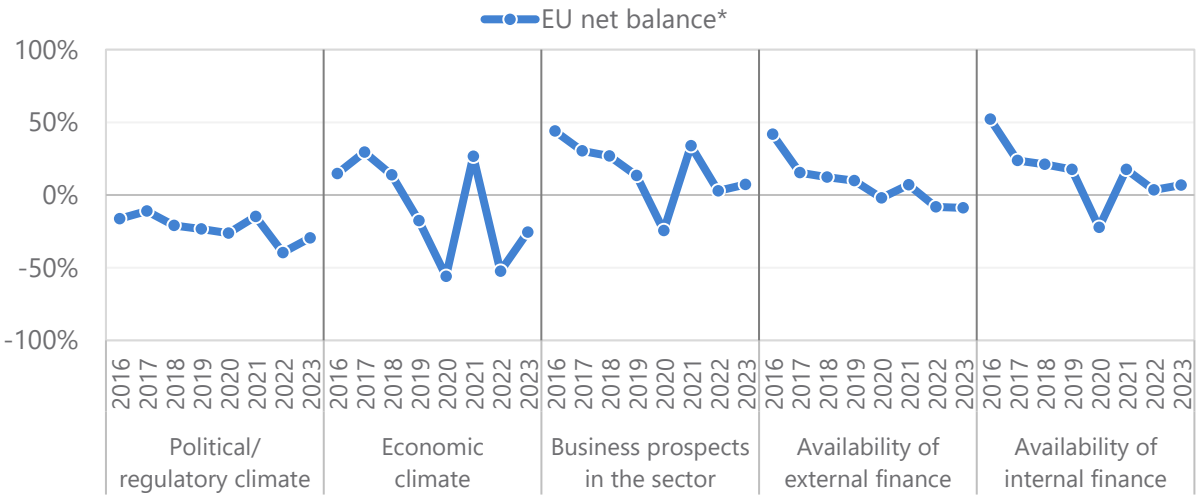
[60] The eighth wave of the annual EIB Investment Survey (EIBIS) was conducted between April and July 2023. EIBIS helps to monitor investment and investment finance activities of non-financial corporates in the European Union and capture potential barriers to investment. It is administered by telephone (in the local language) and takes an average of 25 minutes to complete. The annual General Module of the eighth wave includes additional questions on digital, climate, international trade and on the impact of energy market developments on firms. The survey covers approximately 12 000 firms across the EU27 and, since 2019, slightly more than 800 firms in the United States. Using a stratified sampling methodology, the EIBIS General Module is representative across all 27 Member States of the European Union and the United States. It is representative across four firm size classes (micro, small, medium and large) and four sector groupings (manufacturing, services, construction and infrastructure) within the individual countries.

Figure 1. Investment cycle



Source: EIBIS 2020-2023
Share of firms investing shows the percentage of firms with investment per employee greater than €500.
Base: All firms (excluding don't know/refused responses)

Figure 2. Economic sentiment: Net balance improvement/deterioration in %



Source: EIBIS 2016-2023
Question: Do you think that each of the following will improve, stay the same, or get worse over the next 12 months?
Base: All firms (excluding don't know/refused responses)

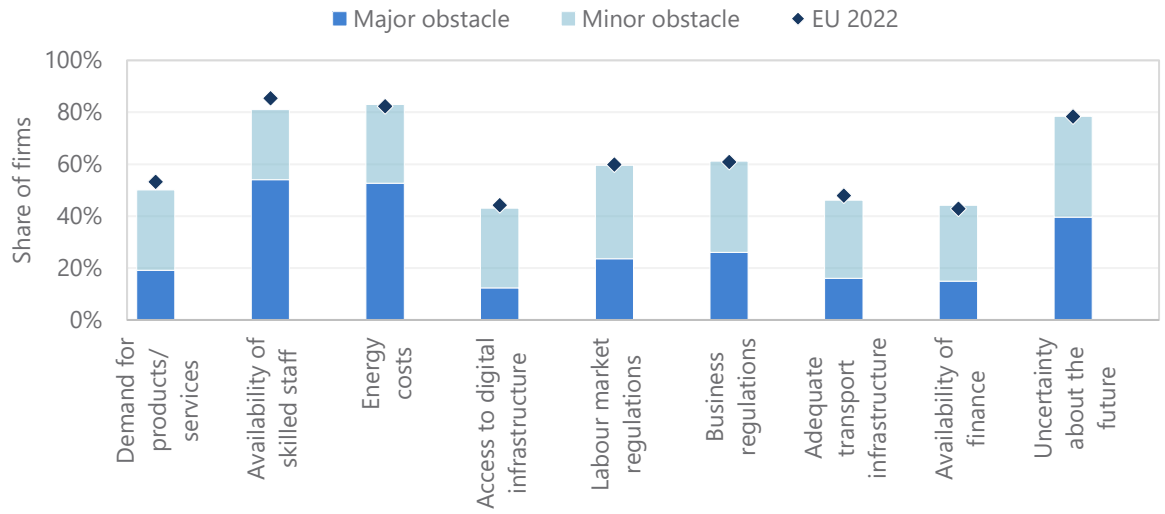
Investment barriers and finance constraints are elevated and increasing

Major long-term barriers to investment are still energy costs, uncertainty and lack of skills, with 83%, 78% and 81% of EU firms, respectively, mentioning these factors as constraints to investment (Figure 3). Compared with US firms, EU firms are more likely to report energy costs as a major barrier. US firms are more likely to report business regulations and labour market regulations as barriers, compared with EU firms.

At the EU level, the share of finance-constrained firms remains elevated by historical standards (Figures 4 and 5). In EIBIS 2023, the share of financially constrained firms is 6.1%, which is 1.4 percentage points above the

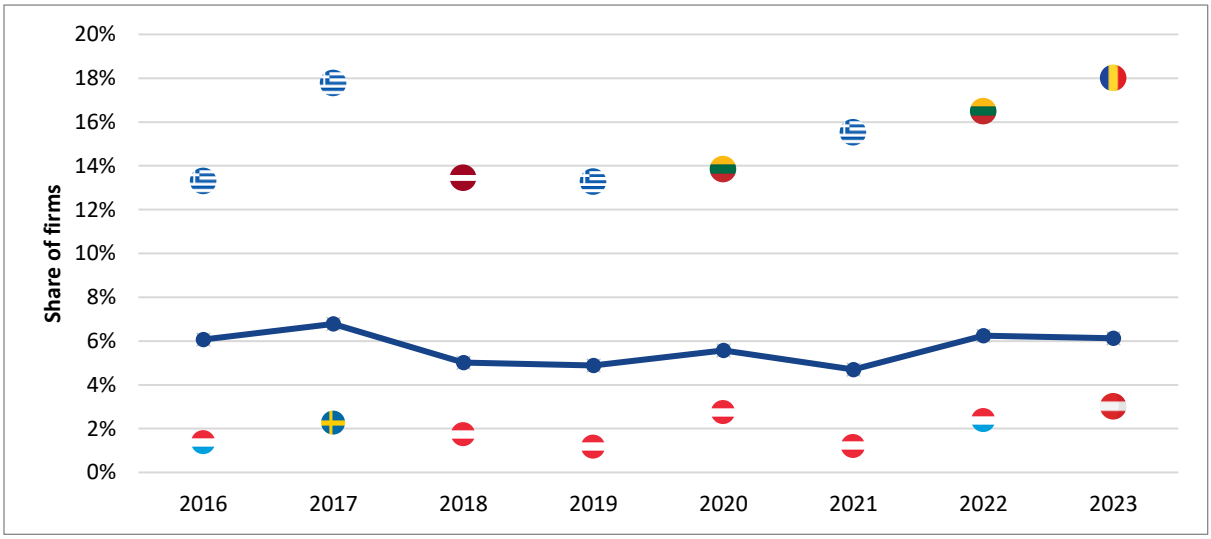
record low from EIBIS 2021. Small and medium businesses are particularly affected, with 7.2% of these firms being financially constrained. There are some differences across Europe, with the Central Eastern and South-Eastern European region having the highest share of financially constrained firms.

Figure 3. Investment barriers



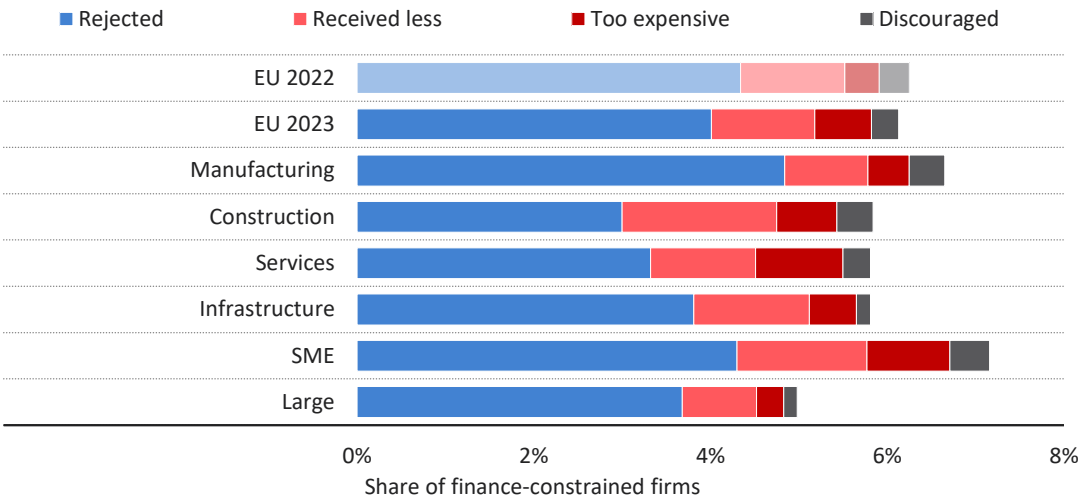
Source: EIBIS 2022, 2023
Question: Thinking about your investment activities, to what extent is each of the following an obstacle? Is it a major obstacle, a minor obstacle or not an obstacle at all?
Base: All firms (data not shown for those who said not an obstacle at all/don't know/refused)

Figure 4. Share of finance-constrained firms



Source: EIBIS 2016-2023
Note: Finance-constrained firms include those dissatisfied with the amount of finance obtained (received less), firms that sought external finance but did not receive it (rejected) and those who did not seek external finance because they thought borrowing costs would be too high (too expensive) or they would be turned down (discouraged).
Base: All firms (excluding don't know/refused responses)

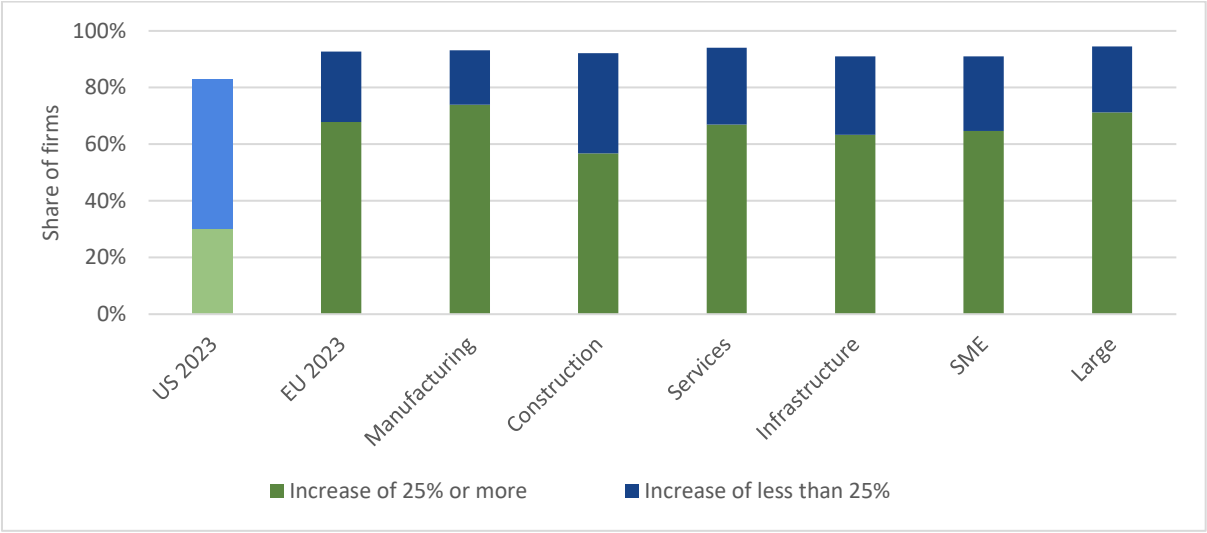
Figure 5. Share of finance-constrained firms in more detail



Source: EIBIS 2022, 2023
Note: Finance-constrained firms include those dissatisfied with the amount of finance obtained (received less), firms that sought external finance but did not receive it (rejected) and those who did not seek external finance because they thought borrowing costs would be too high (too expensive) or they would be turned down (discouraged).
Base: All firms (excluding don't know/refused responses)

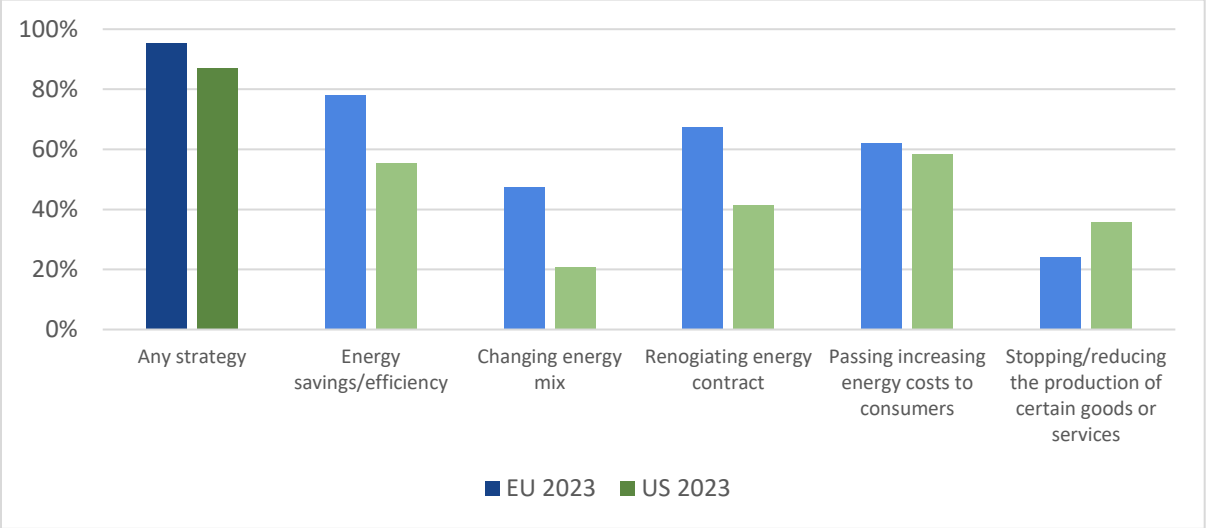
Energy costs are a concern for 83% of EU firms, with 68% of EU firms reporting a significant increase (of more than 25%) in energy costs, compared with only 30% of US firms (Figure 6). For strategies to deal with the energy shock, EU firms are slightly more likely than US firms to propose at least one of the suggested strategies. A total of 62% of EU firms consider passing increased energy costs to their clients as a way to deal with the energy market developments (Figure 7).

Figure 6. Increased spending on energy



Source: EIBIS 2023
Question: Since the beginning of 2022, by how much has your company's spending on energy (including gas, electricity, oil) changed on average?
Base: All firms (excluding don't know/refused responses)

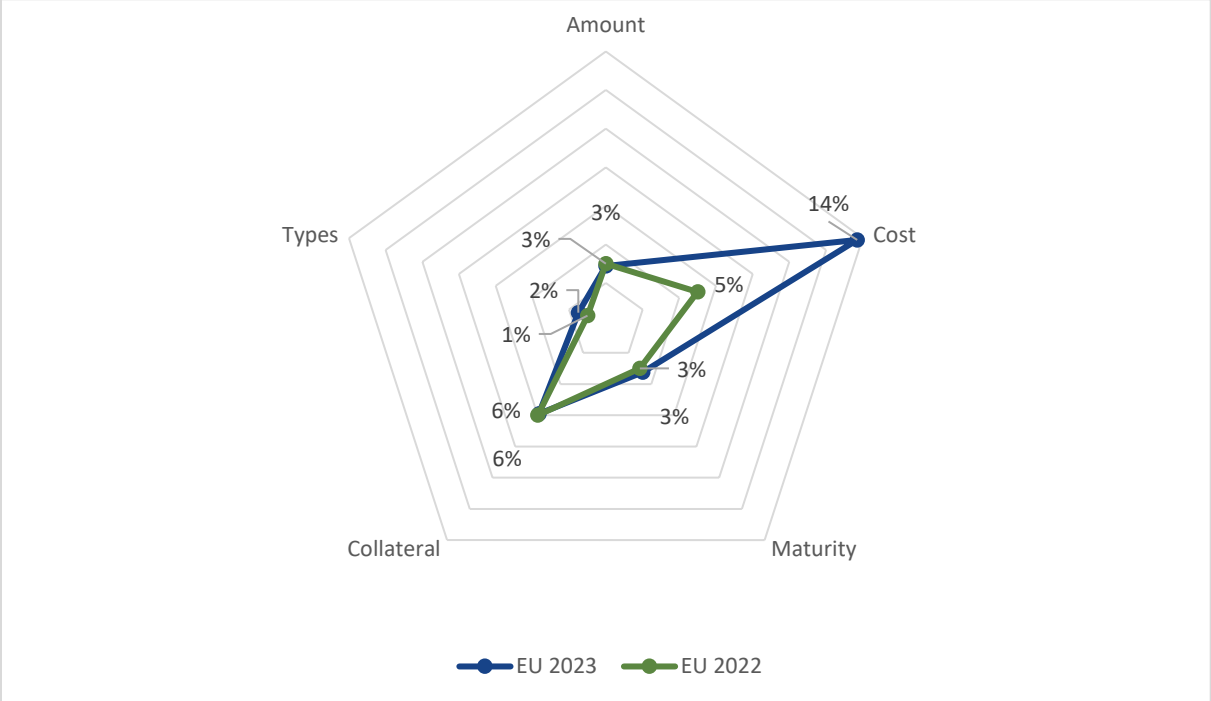
Figure 7. Strategies to deal with the energy shock



Source: EIBIS 2023
Question: Which, if any of the following, are your priorities/strategies to deal with the recent developments in the energy market?
Base: All firms (excluding don't know/refused responses)

External finance constraints are starting to bite. In the 2023 edition of the survey, firms are increasingly dissatisfied with the cost of finance. The share of firms dissatisfied with the cost of finance increased markedly, from 5% of EU firms in EIBIS 2022 to more than 14% in EIBIS 2023 (Figure 8).

Figure 8. Dissatisfaction with external finance received

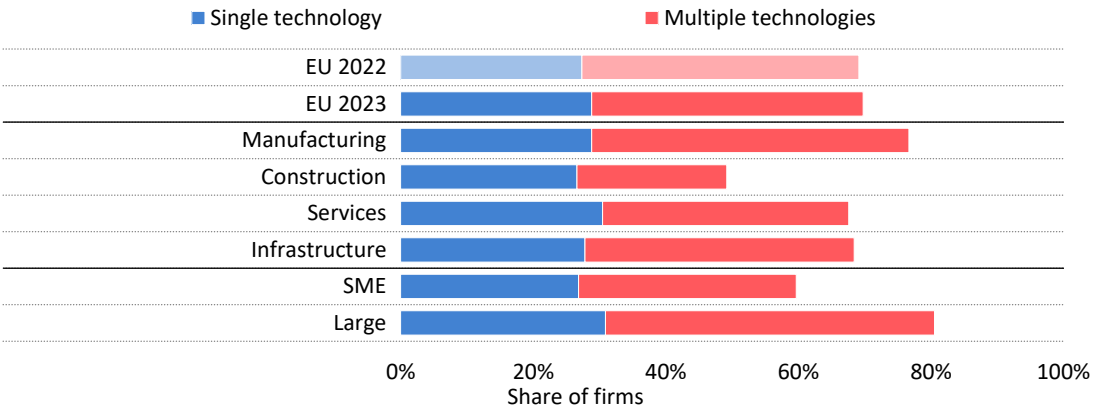


Source: EIBIS 2022, 2023
Question: How satisfied or dissatisfied are you with …?
Base: All firms that used external finance in the last financial year (excluding don't know/refused responses)

Pressed by structural transformation needs, investment is showing resilience

EU firms are investing in digitalisation, narrowing the gap with the United States. Approximately 70% of EU firms now use at least one advanced digital technology, continuing the post-pandemic trend of catch-up with the United States (Figure 9). To make sure that no persistent gap is created with their US peers, EU firms need to remain vigilant and reinforce the use of artificial intelligence, which is a key technology in the digital transformation.

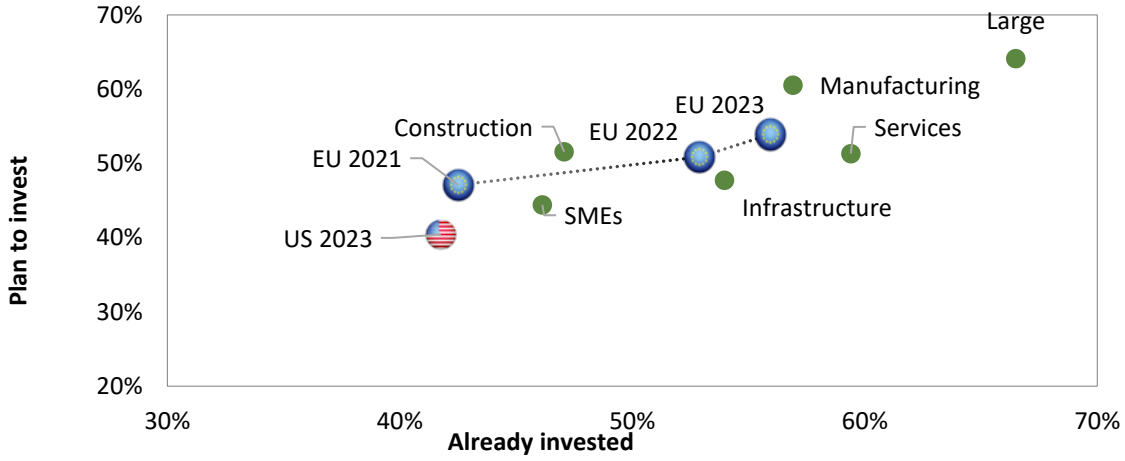
Figure 9. Use of advanced digital technologies



Source: EIBIS 2022, 2023
Question: Can you tell me for each of the following digital technologies if you have heard about them, not heard about them, implemented them in parts of your business, or whether your entire business is organised around them?
Base: All firms (excluding don't know/refused responses)

Firms are accelerating investment in energy efficiency as well as climate change more broadly. The share of EU firms investing in energy efficiency jumped 11 percentage points from the 2022 survey, to 51%. The share of EU firms having invested to tackle the causes and effects of climate change (56%) and that plan such investments in the next three years (54%) remain above that reported in the United States (42% and 40%, respectively) and continues to increase steadily (Figure 10).

Figure 10. Investment plans to tackle climate change impact

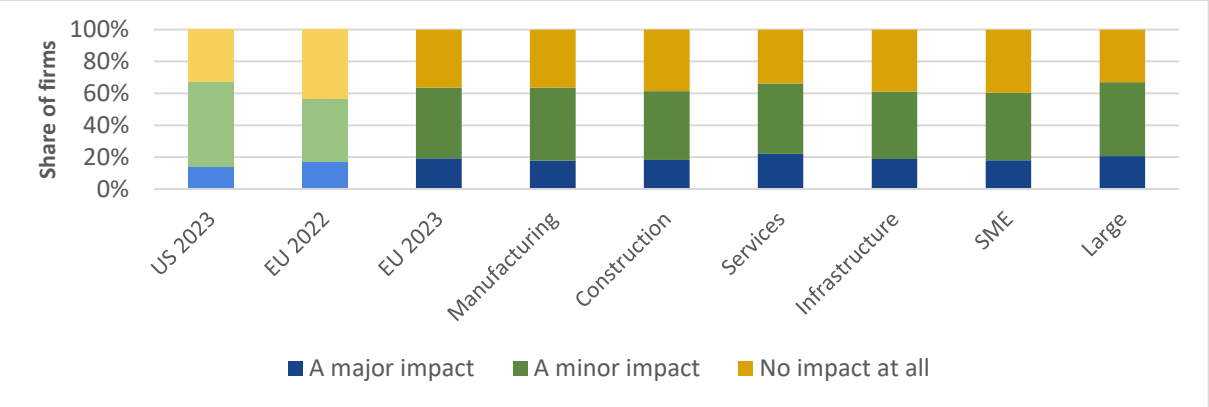


Source: EIBIS 2020-2023
Question: EIBIS 2020-2023
Which of the following applies to your company regarding investments to tackle the impacts of weather events and to help reduce carbon emissions?
EIBIS 2021 and before
Now thinking about investments to tackle the impacts of weather events and to deal with the process of reduction in carbon emissions, which of the following applies?
Please note: question change and an additional answer option was included in 2022, this may have influenced the data. Treat comparison to 2021 with caution.
Base: All firms (excluding don't know/refused responses)

The climate emergency is becoming more pressing for EU firms

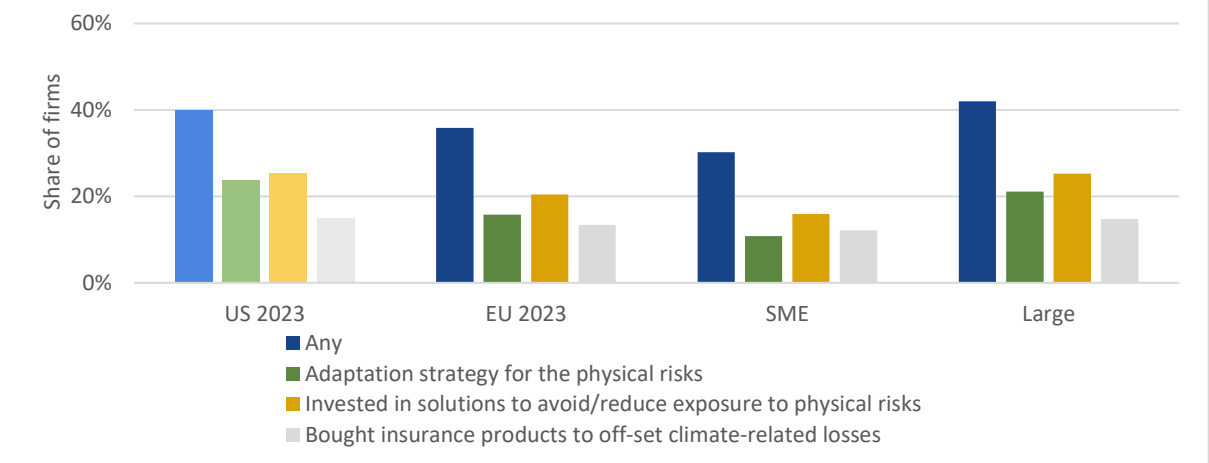
The share of EU firms that say climate change is already affecting their business has jumped 7 percentage points in a year, to 64% of firms now facing physical risks (Figure 11). Approximately 36% of EU firms have taken any of the actions asked about to build resilience to climate change risks, but only 13% of EU firms have bought insurance for physical risk protection (Figure 12).

Figure 11. Impact of climate change – physical risk



Source: EIBIS 2022, 2023
Question: Thinking about the impact of climate change on your company, such as losses due to extreme climate events, including droughts, flooding, wildfires or storms or changes in weather patterns due to progressively increasing temperature and rainfall. What is the impact, also called physical risk, of this on your company?
Base: All firms (excluding don't know/refused responses)

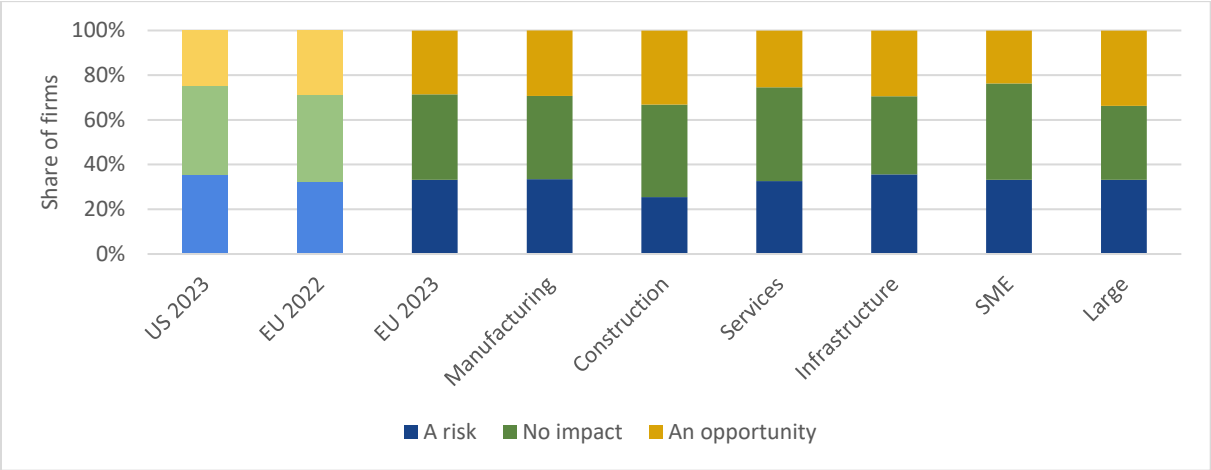
Figure 12. Building resilience to physical risk



Source: EIBIS 2023
Question: Has your company developed or invested in any of the following measures to build resilience to the physical risks to your company caused by climate change?
Base: All firms (excluding don't know/refused responses)

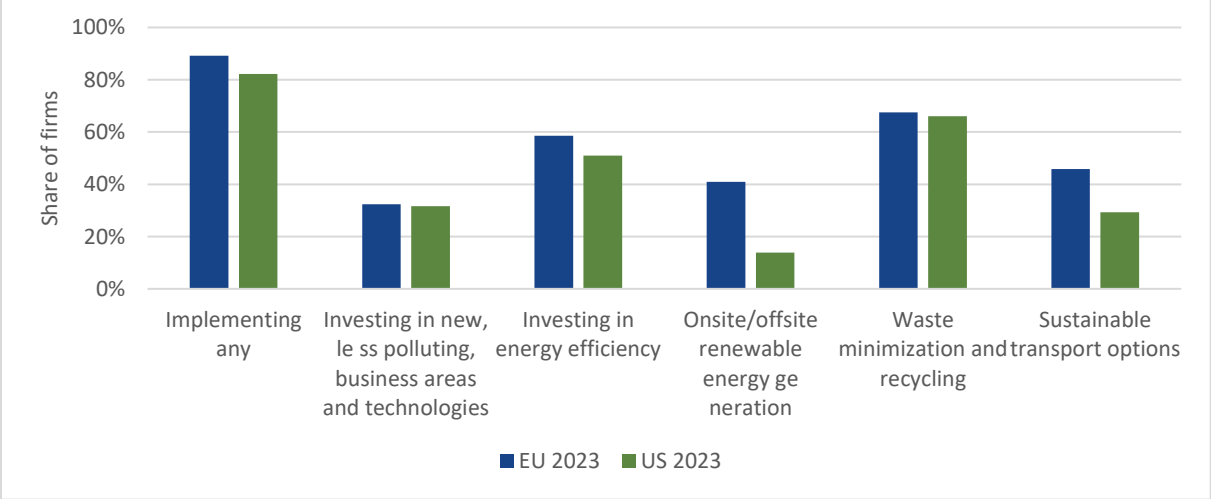
The share of EU firms perceiving climate transition as a risk is 33%. In contrast, 29% of EU firms perceive climate transition as an opportunity (Figure 13). Almost 90% of EU firms have taken action to reduce greenhouse gas emissions, above the share in the United States (82%) (Figure 14). The main actions in the European Union are investments in energy efficiency (59%) and waste minimisation and recycling (67%). More EU firms than US firms are investing in/implementing onsite/offsite renewable energy generation and sustainable transport. Approximately 32% of EU firms invest in new, less polluting, business areas and technologies, and the figure for the United States is similar.

Figure 13. Impact of climate change – risks associated with the transition to a net zero emission economy over the next five years



Source: EIBIS 2022, 2023
Question: Thinking about your company, what impact do you expect this transition to stricter climate standards and regulations will have on your company over the next five years?
Base: All firms (excluding don't know/refused responses)

Figure 14. Actions to reduce greenhouse gas emissions



Source: EIBIS 2023
Question: Is your company investing or implementing any of the following, to reduce greenhouse gas (GHG) emissions?
Base: All firms (excluding don't know/refused responses)

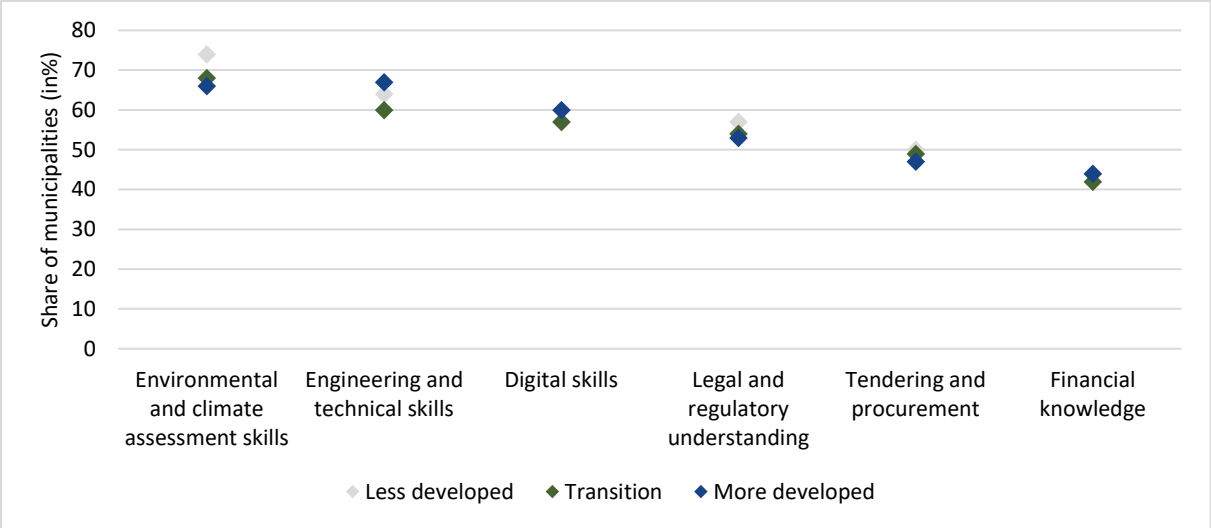
To remain competitive, European corporates must continue investing

The competitiveness of EU firms is increasingly challenged by structural factors and firms still need to reap the benefits of recent progress on investment. The risks come from various angles: the European Union needs to make sure that no persistent gap with the United States is created in the use of key digital technologies, such as artificial intelligence. EU firms have also been more impacted by high energy costs than US firms. In addition, availability of staff with the right skills remains a key impediment for the investment of EU firms, more so than barriers such as uncertainty and regulatory constraints.

Skills are not only an issue for firms, but also for the public sector, and are a large barrier to implementing investment programmes in less developed regions. EU municipalities share firms' concerns about the availability of skilled staff and identify it as a major barrier to their investment plans, along with supply chain constraints. Accessing experts with environmental and climate assessment skills is reportedly the most challenging issue, with one-third of municipalities in less developed regions considering it a major problem for their investment

implementation. This proportion is marginally lower in municipalities in more developed and transition regions. Approximately two-thirds of municipalities in more developed regions perceive access to experts with engineering or technical skills as problematic. This perception is slightly lower in less developed and transition regions (Figure 15). Municipalities in less developed regions are more pessimistic about two demographic trends that could further exacerbate the scarcity of skilled labour: outward migration and population ageing.

Figure 15. For each of the following areas, to what extent is access to experts a major/minor problem to the delivery of your municipality's investment programme (in %)



Source: EIBIS Municipality Survey 2022
Base: All municipalities (excluding don't know/refused responses)

EIF analysis of smaller corporates and small and medium businesses

This section examines the root causes of the financing challenges facing small and medium businesses and provides examples of the difficulties faced by those that received support from the EIF. It also delves into specific financing markets for such businesses, including venture capital, private equity and microfinance. In this section, we emphasise the issue of inadequate employee skills as a significant barrier to investments. This theme aligns with the European Commission's decision to designate 2023 as the European Year of Skills.[61]

A policy focus on access to external financing sources by small and medium businesses is driven by the premise that these companies, which are important contributors to economic growth, are often more financially constrained than large firms. Small and medium businesses account for approximately 99.8% of all enterprises in the non-financial business sector and create 64.4% of total employment in the European Union. Together, small and medium businesses produce more than half of the value added in the European Union (Kraemer-Eis et al., 2023).

Market imperfections or failures not only affect the economy during a deep recession or a financial crisis, but also constitute persistent structural issues. Asymmetric information (information gaps between the potential provider and the potential beneficiary of financing) is a typical market failure in the financing market for small and medium businesses. The availability and quality of information about smaller — and often younger — enterprises are typically worse than for larger and more mature companies. In particular, startup companies cannot provide a track record, have no or limited collateral, and often the main assets are the ideas of the entrepreneur — who, in many cases, may not have any proven managerial skills. Combined with uncertainty, this causes agency problems that affect the financing providers' behaviour. This can result in an insufficient supply of private capital, and financial institutions are often reluctant to extend uncollateralised financing to small and medium businesses (OECD, 2006). As a result, many small and medium businesses with economically viable

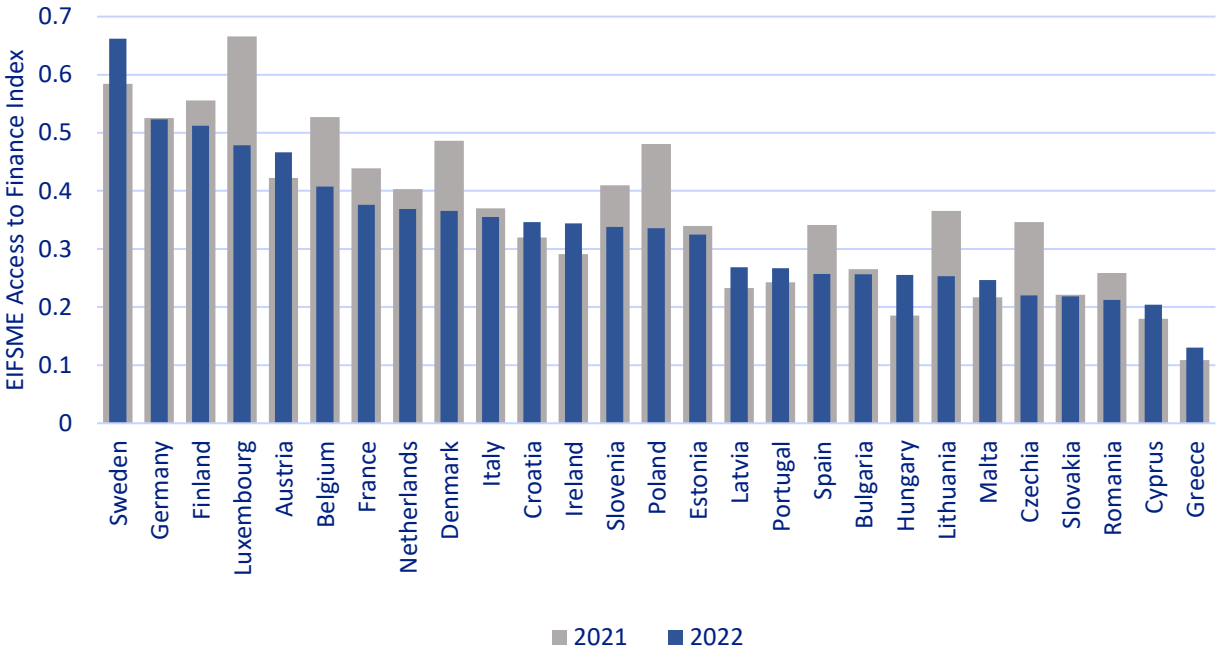
[61] For a more detailed analysis of SME financing in Europe please see Kraemer-Eis et al., (2023, forthcoming).

projects cannot obtain the necessary financing from the regular system of financial intermediation (Kraemer-Eis et al., 2023, forthcoming).

This so-called SME financing gap — an insufficient supply of private external financing to small and medium businesses — is a structural issue but widens in economic downturns. The ability of small and medium businesses to access financing differs among countries. To shed light on the business environment of small and medium companies, the EIF's research team developed the EIF SME Access to Finance Index (ESAF), which is a composite indicator that summarises the state of financing for small and medium businesses in EU Member States and the United Kingdom. The index is composed of four sub-indices, three of which are related to different financing instruments (loans, equity, and credit and leasing), while the fourth covers factors related to the general macroeconomic environment (Gvetadze et al., 2018; Torfs, 2023).

The most recent update to the EIF SME Access to Finance Index (ESAF) marks the tenth iteration of the exercise, covering a decade from 2013. The latest data from 2022 capture the initial impact of rising inflationary pressures and sustained geopolitical uncertainty arising from the Ukraine conflict. Czech Republic, Lithuania, Poland and Romania experienced the most significant deteriorations in their ESAF indices, likely due to their proximity to the Ukraine conflict (Figure 1). The most favourable finance conditions for small and medium businesses were observed in Sweden, Germany and Finland, whereas Greece, Cyprus and Romania exhibited the least favourable conditions.

Figure 1. The EIF SME Access to Finance Index: country comparison and evolution over time



Source: Torfs (2023)

Beyond access to finance, European small and medium businesses face another critical challenge: the availability of skilled employees. According to the European Central Bank Survey on the Access to Finance of Enterprises (ECB SAFE) report (ECB, 2023), the availability of skilled labour continues to be a major concern limiting production, with nearly 30% of small and medium businesses in the euro area identifying "availability of skilled staff or experienced managers" as their most pressing problem in the second half of 2022 (Figure 2). This percentage has steadily increased since the question was first asked in 2014. The only decline occurred at the outset of the COVID-19 crisis when other issues, including access to finance, became relatively more pressing. However, during the pandemic and subsequent lockdowns, companies recognised the importance of specific skills, particularly digital and green skills. Companies also sought financing for training or hiring employees to address these skill gaps.

Figure 2. Importance of skilled staff and, euro area SMEs

Source: ECB (2023)

The scarcity of skilled labour not only hampers current production and business activities but also is a long-term impediment to investment. According to the EIB survey (EIB, 2023), the most frequently mentioned long-term barrier to investment in the European Union is the availability of skilled staff (85%).

The EIF is **a specialist provider of risk finance for small and medium businesses across Europe**. By developing and offering targeted financial products to its intermediaries, such as banks, guarantee and leasing companies, microcredit providers and private equity/venture capital funds, the EIF enhances small and medium businesses' access to finance. Given its intermediated business model, the EIF looks at the portfolio level (intermediaries) and the level of the final beneficiaries (small and medium businesses). In the following subsections of this report, we delve into specific segments of small and medium business financing that face unique investment barriers and challenges, with a particular focus on the availability of adequately skilled workers.

To help address the barrier of skilled workers, the EIF recently introduced the Skills & Education Guarantee Pilot (S&E Pilot), which is a new debt financing initiative aimed at stimulating investments in education, training and skills to address evolving needs in the European economy, particularly in the realms of digital and green transformations. Additionally, the EIF manages equity products under InvestEU that support investments in education-related technology or impact investments in education and skills.

Subsection 1 explores key aspects of microfinance and presents survey results related to challenges encountered by European microfinance providers, including issues related to their clients' digital and green skills. Subsection 2 concentrates on private equity and venture capital financing, highlighting their importance for startup, young and high-growth companies that create value through innovation. The relevance of private equity/venture capital financing extends beyond innovative firms to the broader economy. We present the latest EIF survey results regarding investment barriers and challenges faced by private equity/venture capital firms, including the availability of skilled entrepreneurs. Lastly, subsection 3 offers case studies and concrete examples of small and medium businesses that have benefited from increased access to finance through financial instruments managed by the EIF under the EU Investment Plan for Europe (IPE/EFSI).

1. Microfinance

Microfinance is traditionally defined as the provision of basic financial services to low-income people who lack access to banking and related services[62]. However, the term is increasingly used in a wider sense, to include financial services to existing microenterprises and self-employed people (EMN, 2012; EMN, 2018).

[62] CGAP Definition, Consultative Group to Assist the Poor.

Inclusive finance is the range of financial and non-financial products and services provided to unemployed people or clients from other vulnerable groups who are facing difficulties in accessing conventional banking services due to their socioeconomic status. In addition, inclusive finance is provided more broadly to social enterprises who provide work-integration opportunities or services to groups deemed vulnerable from a socioeconomic standpoint. Inclusive finance promotes entrepreneurship and social inclusion by providing support to microenterprises and social enterprises (Box 1).

Box 1: European Commission definitions of microenterprise and social enterprise

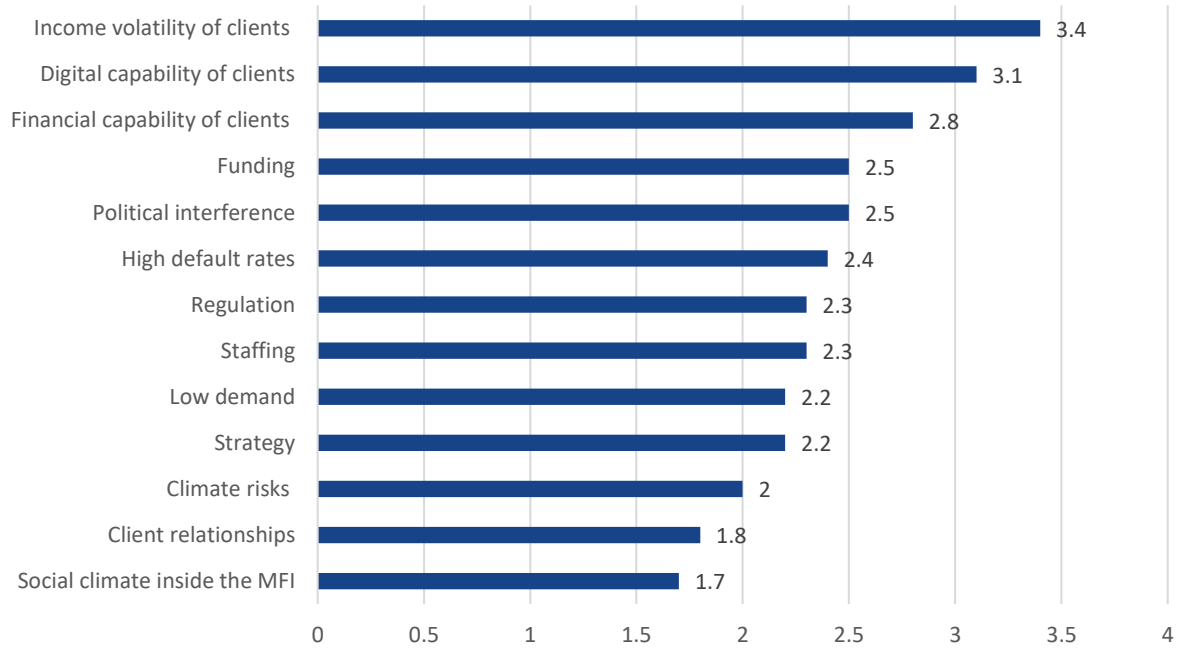
Microenterprise: any enterprise with fewer than ten employees and a turnover below €2 million (as defined in the Commission Recommendation 2003/361/EC of 6 May 2003, amended).

Social enterprise: an operator in the social economy whose main objective is to have a social impact rather than make a profit for its owners or shareholders, while operating in a market-driven environment (as defined by the European Commission, 2011).

Microenterprises and individuals from vulnerable segments of the labour market with entrepreneurial aspirations often lack specific skills and encounter difficulties related to securing financing, especially during crises. As previously discussed, small and medium businesses faced a shortage of digital skills during the COVID-19 pandemic and subsequent lockdowns. They also face a scarcity of "green skills" to deal with the climate crisis. These challenges are even more pronounced for smaller entities like microenterprises. Due to their smaller and younger nature, such businesses typically have narrower skill sets, making these obstacles more evident during crises.

Microfinance institutions, which serve as primary providers of microfinance services, are dealing with several challenges, including income volatility and the financial literacy of their clients. However, the most prominent challenge revolves around the digital capabilities of their clients (Figure 3). This concern was particularly evident during the COVID-19 lockdowns, as social distancing regulations hindered traditional face-to-face interactions, which are essential for relationship management in the microfinance sector (EMN-MFC, 2022).

Figure 3. Key challenges faced by microfinance institutions



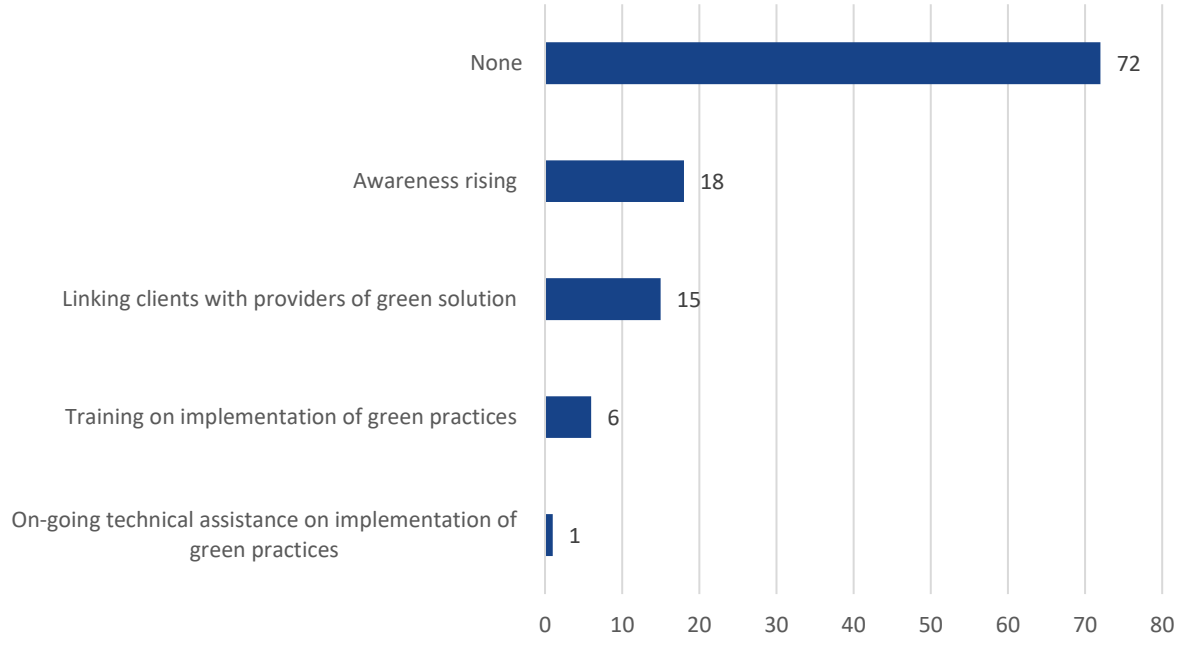
Source: EMN-MFC (2022)
Note: 1 = Negligible, 5 = Very significant

Enhancing clients' digital skills and embracing digitalisation in general can streamline communication with borrowers, accelerate loan processing and improve monitoring. Digitalisation also extends outreach, enabling borrowers — particularly those in remote areas with limited access to physical branches — to conveniently access their accounts. Furthermore, digital solutions can alleviate the burden of excessive paperwork. In addition to offering financial products digitally, microfinance institutions can remotely train and mentor their clients.

Unemployed individuals or clients from vulnerable groups often require more than just digital skills for success; coaching and mentoring are crucial. However, the technical assistance provided during the loan term is often limited. Besides financial products and services, many European microfinance institutions offer non-financial services (EMN-MFC, 2022). These services are usually provided to clients free of charge or at a loss, posing a financial challenge for microfinance providers. This is why state-owned banks, credit unions and non-government organisations tend to offer non-financial services more frequently than non-bank financial institutions or private sector banks.

Almost one-third of microfinance institutions in Europe provide non-financial services to support their clients in transitioning towards environmentally friendly practices. These services primarily focus on raising awareness among clients about climate change vulnerability, negative environmental impacts and potential mitigation strategies (18%). The second most common service involves connecting clients with providers of green technologies or building their capacity for eco-friendly practices (15%). Microfinance institutions in Eastern Europe offer green non-financial services (34%) more frequently than their Western European counterparts (14%). Microfinance institutions that offer dedicated green microloans are particularly likely to offer such services (Figure 4).

Figure 4. Percentage of microfinance institutions by engagement in green non-financial services



Source: EMN-MFC (2022)

Given the inclusive finance sector's ongoing difficulties, support at the EU level is critical to develop the full spectrum of participants and services. Support at the EU level comes in the form of funding, guarantees and technical assistance and is available to a broad range of financial intermediaries, from small non-bank financial institutions to banks well-established in the microfinance or social enterprise finance market.

The EIF currently supports microfinance and social entrepreneurship under the European Commission's Programme for Employment and Social Innovation (EaSI). This programme offers three instruments: (i) the EaSI Guarantee Instrument to increase access to finance for microenterprises, social enterprises and vulnerable groups; (ii) the EaSI Capacity Building Investments Window to help build up the market via investment (for example, in scaling up or developing IT infrastructure (mobile banking), recruitment and training of staff,

strengthening operational and institutional capabilities or seed financing support of newly created intermediaries with a strong social focus); and (iii) the EaSI Funded Instrument launched in the fourth quarter of 2019. The EIF provides senior and subordinated loans to financial intermediaries for on-lending to microborrowers and social enterprises. In the first half of 2022, the EIF began implementing InvestEU, which will provide strong EU support under the social window to microfinance and social enterprise finance until 2027. Based on the expressions of interest received so far, the demand for guarantees and capacity building investments remains high. The EaSI instruments aim to enhance access to finance for microenterprises, social enterprises and vulnerable groups and enable the provision of non-financial services, including mentoring and training. These services are geared towards enhancing recipients' skills and strengthening their digital and green capabilities.

2. Private equity and venture capital

The justification for public intervention in the area of small and medium business financing in general, and external equity financing in particular, is rooted in various factors, such as the presence of information asymmetries in the relationship between financier and recipient, the presence of fixed investment costs, and the positive externalities generated by innovation activities of small and medium businesses. In the private equity/venture capital market, long investment cycles can deter private investors, especially in early-stage financing, whereas public agents can be viewed as more "patient" investors. The EIF concentrates on supporting the private sector's venture capital infrastructure to address market gaps and opportunities with the aim of further enhancing the attractiveness of European venture capital as an alternative asset class.

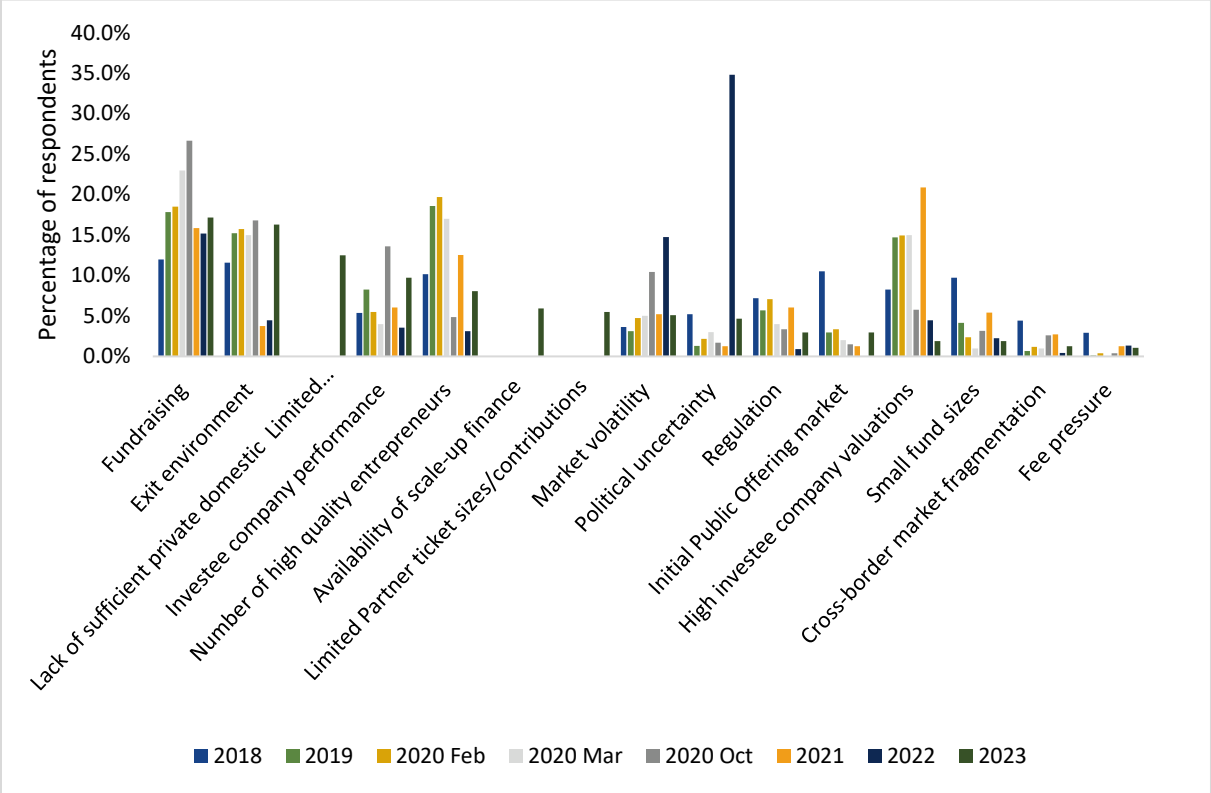
The EIF strives to improve the availability of information for evidence-based policy interventions, which are especially needed during crises and in their aftermath. In 2017, the EIF launched the EIF Venture Capital Survey (EIF VC Survey), a survey among venture capital general partner/management companies. The EIF VC Survey was repeated in 2019, 2020 (two waves, on an exceptional basis, due to the COVID-19 crisis), 2021, 2022 and 2023, and was complemented by the EIF Private Equity Mid-Market Survey (EIF PE MM Survey).[63]

These EIF surveys are powerful information tools and provide valuable insights regarding the market sentiment and market situation in general. The latest waves of the EIF VC Survey and the EIF PE MM Survey were completed in early September 2023 and revealed some interesting insights about perceived challenges. At a fund level, fundraising and the exit environment have been the main challenges in 2023. For private equity mid-market fund managers, geopolitical uncertainty and related consequences (for example, the Ukraine war) were also a considerable challenge, whereas this was less frequently stated by venture fund managers (Figure).

These results are mirrored in longer-term patterns that hint towards structural issues, which can also be interpreted as long-run risks or investment barriers. In the past, "Fundraising" featured among the top challenges, and fundraising issues relate, for example, to the lack of involvement of large private institutional investors in the market. A bad exit environment is also a recurring challenge, which has been exacerbated in the current circumstances of a difficult macroeconomic situation and geopolitical environment. Such structural and interlinked problems contribute to the often-quoted scale-up gap in Europe, which can also be interpreted as a long-run risk. The scale-up gap is visible in the survey results, as fund managers stated that the lack of sufficient domestic investors in venture capital funds and the lack of scale-up finance for venture-backed companies, as well as deal sizes, were significant challenges, when these response options were added to the survey questionnaire in 2023.

[63] The EIF VC Survey and the EIF PE MM Survey are surveys among general partner/management companies active in the venture capital market and the private equity mid-market, respectively, and headquartered in the EU27, the United Kingdom and other European countries. See www.eif.org/research for the survey results publications.

Figure 5. Biggest challenges in venture capital business

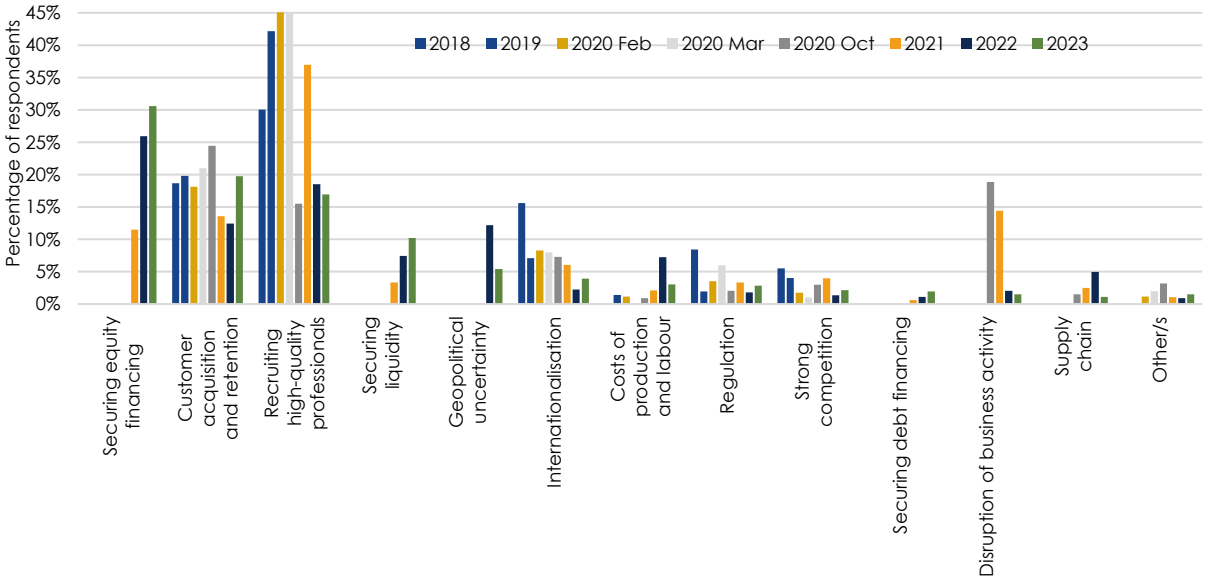


Source: EIF VC Survey 2023

Notes: EIF VC Survey 2023 question "Please select the biggest challenge you currently see in the venture capital business." This question allowed for multiple selections; the figure shows the responses for the items that respondents ranked as their top challenge. Categories selected by 1% of respondents or less are not shown. Since 2022, the category "Political uncertainty" was broadened to include "Geopolitical uncertainty and related consequences.". In 2023, the category "Investee company performance" was changed to "Portfolio company performance,", while the categories "Availability of scale-up finance for venture-backed companies,", "Lack of sufficient private domestic LPs" and "LP ticket sizes/contributions" were introduced.

At the level of portfolio companies, a lack of high-quality professionals has long been cited as one of the most — if not the most — important challenges. The problem can be interpreted as a longer-term structural issue that is not only present in the venture capital space, but also as a general economic issue linked to supply, demand and skill mismatches, as well as demographic developments in the labour force. However, in the 2023 survey, recruiting high-quality professionals was overtaken by other challenges linked to the difficult macroeconomic environment and geopolitical situation, that is, securing equity finance as well as customer acquisition and retention (in the case of venture capital portfolio companies; see Figure) or, in the case of private equity mid-market portfolio companies, geopolitical uncertainty and related consequences as well as labour and production costs.

Figure 6. Biggest challenges for venture capital portfolio companies



Source: EIF VC Survey 2023

Notes: EIF VC Survey 2023 question "Please select the biggest challenges you currently see for your venture portfolio companies." This question allowed for multiple selections; the figure shows the responses for the items that respondents ranked as their top challenge. Categories selected by 1% of respondents or less are not shown. Some categories were not available each year (for example, the category "Geopolitical uncertainty […]" was only available in the years 2022 and 2023). The category "Disruption of business activity" is "Disruption of business activity or changes to how the business operates (for example, due to COVID-19 measures or export restrictions)" in the survey questionnaire.

The European private equity/venture capital ecosystem survived the COVID-19 crisis without major damage. In the case of European venture capital, this revealed a certain degree of resilience. Venture capital activity showed no signs of "long COVID" and quickly bounced back from the measurable harm of the lockdowns across Europe (Crisanti et al., 2021).

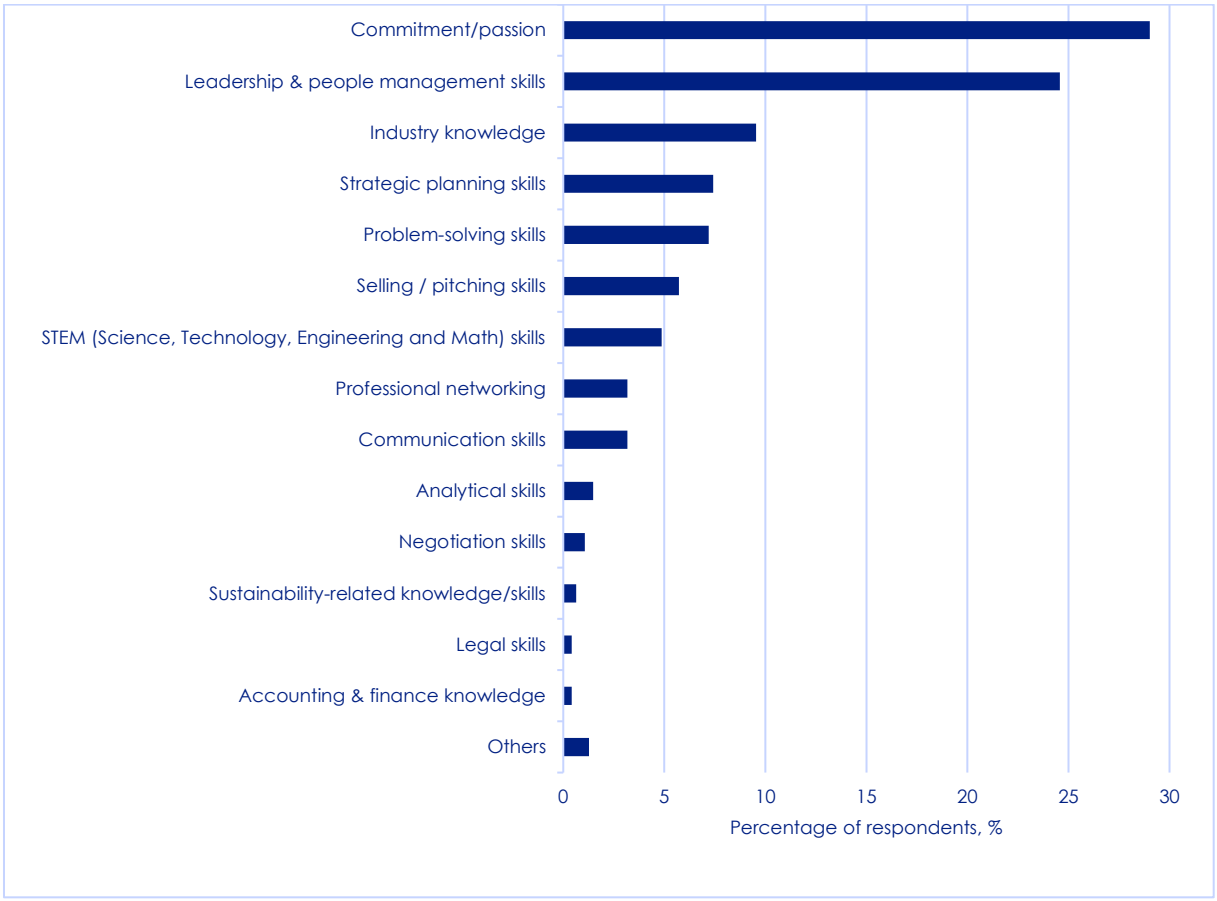
Russia's aggression against Ukraine, the new geopolitical situation and the very difficult macroeconomic environment have created new challenges for financing markets for small and medium businesses since 2022, including for the European private equity/venture capital markets. In addition, there is a need for market resilience to mitigate long-run risks. This is true for individual small and medium businesses, and for the markets. The ambition of the EIF is to support a further developing and more stable market that can absorb shocks without major damage.

For the private equity and venture capital markets, the 2008 global financial crisis led to a market crash. Since then, the venture capital ecosystem has improved significantly — but there is still a long way to go. There is a need to incentivise more private long-term investors that stay in the market, even during downturns. This would improve exit markets, enlarge the venture capital ecosystem and foster efficient interaction between venture capital hubs to ensure the further development of a more resilient market.

Here, the EIF has an important mission to act in the event of market failures and to mitigate long-run risks, in particular by designing and implementing financial instruments that support defined longer-term public policy goals. One of the goals of the EIF is social impact, skills and human capital. The above-mentioned surveys reveal interesting insights regarding investment barriers for venture capital, also from a perspective of people and their skills.

In 2023, private equity mid-market and venture capital fund managers both stated that leadership and people management skills were among the most important skills for the management teams of their portfolio companies. However, a large share of venture capital fund managers considered commitment/passion as even more relevant. Many venture capital respondents also stated that industry knowledge, strategic planning, and problem-solving skills were the most important skills for the management teams of their portfolio companies (Figure).

Figure 7. Most important *skills* for the management team of venture capital portfolio companies



Source: EIF VC Survey 2023

Notes: EIF VC Survey 2023 question "Which are the most important skills for the management team of your portfolio companies?" This question allowed for multiple selections; the figure shows the responses for the items that respondents ranked as their top challenge.

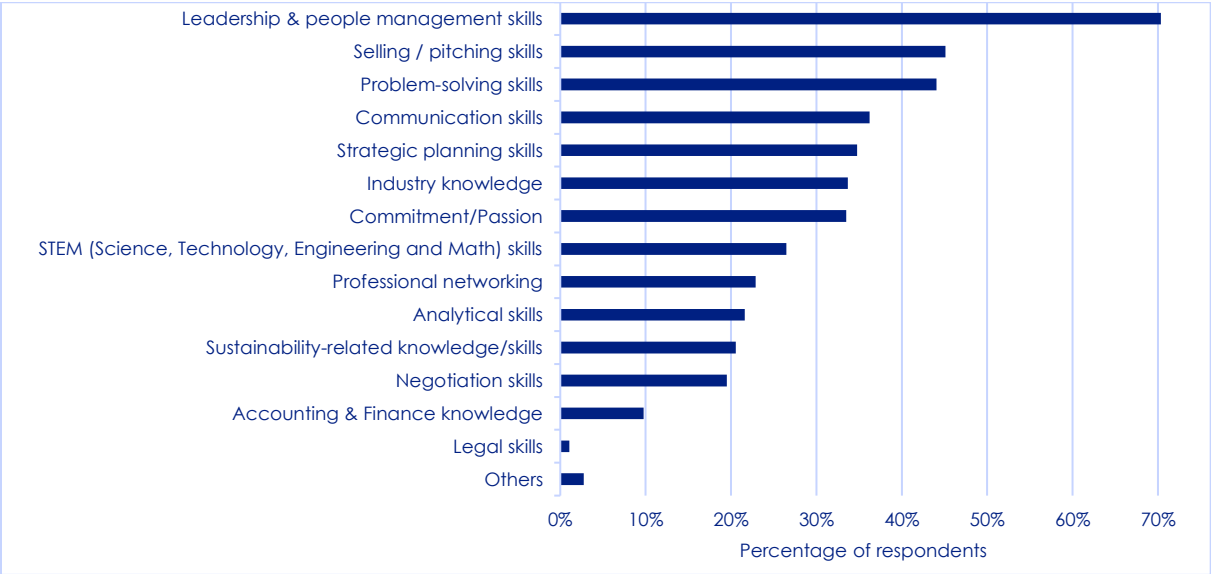
At the same time, leadership and people management skills are perceived as the most common skill gap at the management level of venture capital and private equity mid-market portfolio companies, as stated by fund managers from both groups. Many venture capital fund managers perceived the most common skill gaps in the areas of selling/pitching skills and strategic planning skills (Figure). Accounting and finance knowledge was also frequently stated. In contrast, commitment/passion and analytical skills were rarely stated to be lacking among the managers of venture capital portfolio companies.

Figure 8. Most common *skill gaps* of the management teams of venture capital portfolio companies

Source: EIF VC Survey 2023.
Notes: EIF VC Survey 2023 question "Which are the most common skill gaps of the management team of portfolio companies you have interacted with?" This question allowed for multiple selections; the figure shows the responses for the items that respondents ranked as the first most common skill gap.

Looking at potential future developments, venture capital and private equity mid-market fund managers both expect that leadership and people management skills will be the skills in most demand in their portfolio companies five years from now (Figure). Venture capital fund managers also expect selling/pitching and problem-solving skills to be in high demand in the medium term. Simultaneously, legal skills and accounting and finance knowledge were less frequently stated to be among the skills expected to be in most demand in the future.

Figure 9. Skills expected to be in most demand in five years in venture capital portfolio companies



Source: EIF VC Survey 2023
Notes: EIF VC Survey 2023 question "In your opinion, what are the skills that will be in most demand in 5 years in your portfolio companies?" This question allowed for multiple selections without ranking options, which is why the sum of the percentages in the figure is greater than 100%.

Enterprises financed by private equity or venture capital fund managers are active in a range of sectors, and the skillsets that these companies require are heterogenous. However, the EIF survey results reveal, some commonalities and patterns. Finding high-quality professionals is a key challenge not only for private equity/venture capital-supported companies, but also for businesses in general, as confirmed by other studies (EIB, 2022; European Commission, 2022). Although commitment/passion are crucial "skills," particularly for managers of venture capital-backed companies, leadership and people management skills are also very relevant for company management teams, and this is not expected to change in the future. In contrast, such skills are frequently lacking among the management teams of private equity/venture capital portfolio companies.

Fund managers frequently observe gaps related to other skills, in particular selling/pitching skills and strategic planning skills. Such skill gaps might often be linked to the (lack of) experience among the managers of portfolio companies, particularly in young enterprises or startups. Therefore, venture capital fund managers are often instrumental in providing not only financing, but also advice and a network to people or professional organisations that can help bridge such skill gaps. Venture capital and private equity (mid-market) fund managers therefore play vital roles for companies in their early stages and when they aim to scale up and grow, often beyond national borders. Support for these financing segments, for example, the EIF's investments in venture capital and growth funds, aim to improve the conditions for the launch and growth of innovative European enterprises, and thereby promote the innovativeness and growth potential of the European economy.

3. Case studies: Focus on skills and education

More than a million small and medium businesses and entrepreneurs across Europe have been able to start, sustain or expand their businesses due to EIF support. By focusing its efforts on thematic objectives with clear policy impact, the EIF provides vital backing for EU priorities and aligns with market needs.

The following case studies exemplify how the EIF addresses a specific thematic priority: supporting skills and education. Investments in skills contribute to growth, competitiveness and social convergence, while addressing challenges related to digital transformations in the labour market and the shift to a carbon-free economy and society.

Company: codary (Germany)

Type of business: edtech

Financial intermediary: Educapital

Financing purpose: product development; sales & marketing

EIF financing: InvestEU

Just as reading and writing were the foundation for education and communication in the past, coding is becoming the fundamental language for technology and innovation.

"Digitalisation of schools is seriously lagging behind. We saw how schools struggled to reach kids during the pandemic… There are often no laptops for teachers, and many schools in Germany don't even have Wi-Fi. Worse yet, we don't have enough people with the right knowledge to tackle these problems: **to digitalise Europe, you first need people with computer skills**," explains Amanda Maiwald, CEO and co-founder of codary, a Berlin-based online coding school. codary covers a range of programming languages, like HTML, CSS, JavaScript, Python, and more, in a way that caters to the learning appetite of children and teenagers: "We teach kids how to code in a playful way. They're taught by coaches, and we start from what they find fun, to make sure they stay interested and motivated."

Customised according to age, the courses also account for gender differences, as the company aims to promote computer science among girls too. "The first programmers were actually female, but then coding was rebranded as a nerdy thing for men. Now there's many societal factors that come into play and after age six, girls tend to think that maths is not for them." For now, girls don't make up half of codary's students, but Amanda wants to change that, attracting more girls to computer science.

Given the potential impact that a project like codary could have, the company secured an investment from EIF-backed Educapital, a female-led venture capital firm specialising in the edtech sector. "We used the financing to reach as many kids as possible," Amanda says, "growing the team, developing the platform and overall improving our outreach. We wanted to maximise our impact by raising awareness of the importance of IT skills — for both

boys and girls." Looking ahead, codary are planning to take these efforts further: hiring more people, creating even more classes and of course, explaining to more parents that coding courses are not only for their sons, but also for their daughters.

Location: Treviso, Veneto

Financial intermediary: EIT Digital

Beneficiary: Federico Bono

Studies: Distributed systems and data mining for big data

Institution: Milan Polytechnic

EIF financing: Skills & Education Guarantee Pilot

Federico Bono is doing a double master's degree, focusing on data science but including a minor on innovation and entrepreneurship, with courses on management — the kind of information you need for a startup. "I was looking for something less typical. Most degrees focused a lot on computer science and engineering. I wanted something different, and I found that at EIT Digital." Having already worked as a freelancer, Federico is very keen to learn more about data science and also the business side of things. "I really enjoy the management courses. I worked at a startup in the past, and was closely involved from the beginning, and saw the thought-process behind each decision. That's exciting. After my degree, I will keep freelancing, but the plan is to set up a business in the software and digital solutions space."

At the EIT Digital Master School, Federico is able to focus on his studies without having to worry about finances. "You don't pay tuition fees, and only start repayment one year after programme completion," he explains, referring to his deferred tuition payment plan, guaranteed in part by the EU. **"That allowed me to reduce my working hours and focus more on the programme itself. Otherwise, I'd be studying at midnight or would have had to get support from my parents to make ends meet."**

Already freelancing as a software engineer, Federico is keen to help small businesses digitalise. "I specialise in designing, coding and developing software that clients need. My main focus is the digitalisation of company processes. I've seen the opportunities for small businesses, but I also saw that these opportunities and benefits are present only if the whole company believes in the digitalisation, learning the new tools and processes that you are creating. You need full buy-in to really get the most out of a digitalisation process. I think most companies saw the opportunities during the pandemic but there are many companies that still prefer, for cultural reasons, more classical ways of working."

In the upcoming second year of his master's programme in Sweden, Federico will focus on data mining, distributed systems and business intelligence and then probably offering digital solutions at a company.

Company: Wright Educational Solutions (Romania)

Sector: education

EIF financing: Skills & Education Guarantee Pilot, EFSI

Financial intermediary: BT Mic

"Kids are spending too much time on their screens. They miss out on interaction with other children, on savouring the outdoors and endless opportunities for discovery that nature provides. We're giving them that chance to reconnect with each other and with nature, develop their social skills and enjoy learning through their natural environments," says Gyongyver Pillich-Wright, founder of Wright Educational Solutions.

Gyongyver is a qualified teacher trainer, specialised in neuro-language coaching. She runs a language school and a logistics for educational services business with partner Marc. The company, based in Macau, Romania, offers educational providers and organisations guidance on management, quality assurance, teacher-training and staff development.

"During the pandemic, as kids were forced to stay home and trapped in virtual reality, parents were desperate for alternatives," she says. "I have always been interested in innovative approaches to teaching, so I began

exploring the idea of using the natural world to improve learning, bring more joy and fun to education, and pull children away from their devices."

In the summer of 2021, Gyongyver and Marc launched a green schooling project, using an EU-guaranteed loan from BTMic and backed by the EIF under the EU's Investment Plan for Europe. The project offers children aged six to ten various afternoon and weekend activities involving exploring local villages, forests and farms, adapted to their normal educational programme. "We're practising alternative methods to teach subjects such as mathematics, physical education and languages through green schooling. We get the children out in the woods and soon enough, the connection happens, letters and numbers emerge through games, hut constructions, tree counting… Suddenly learning becomes exciting."

For Gyongyver, the rewarding result is what the kids create: "Building huts or insect hotels requires collaboration, problem-solving skills, creativity, decision-making, self-discipline, emotional understanding, all of which contribute towards their broader educational development."

The project was interrupted for winter, but Gyongyver can't wait for summer to get going again so that she can continue exploring this new method of teaching. "I want to stimulate children's imagination and desire to learn in a meaningful way."

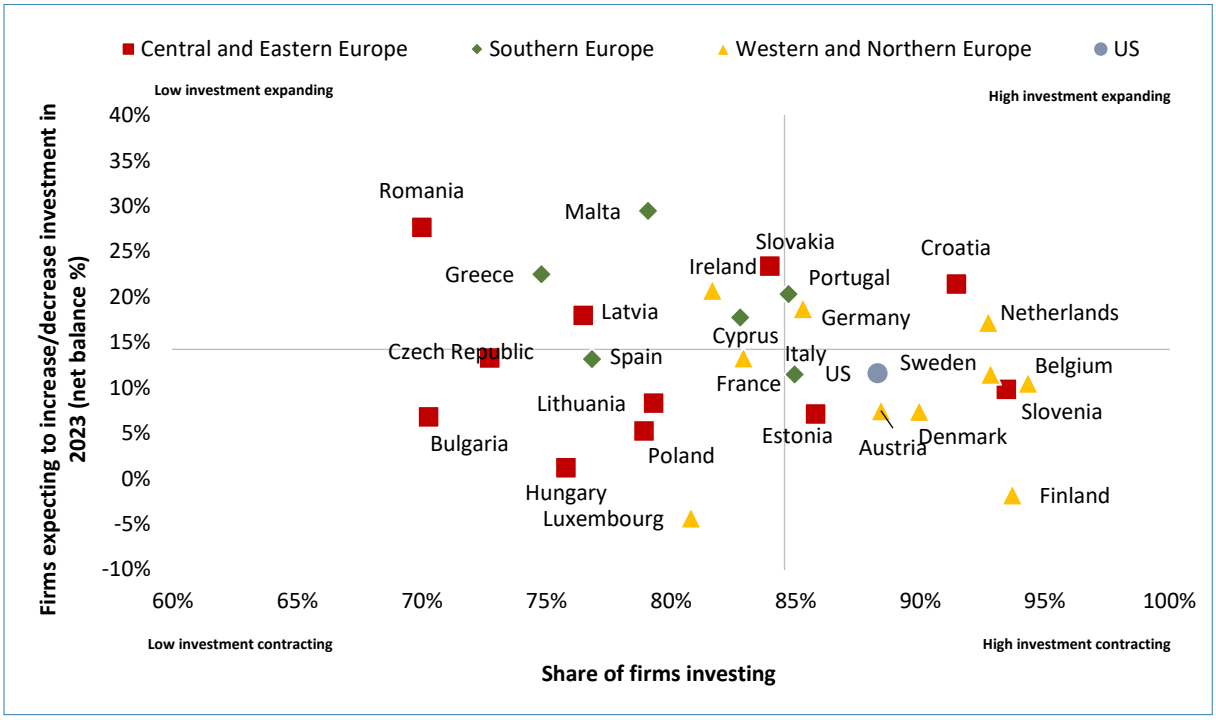
EIF References

- Crisanti, A., Krantz, J., Pavlova, E., & Signore, S. (2021). The VC factor. Pandemic edition. Data driven insights into European VC and its resilience to the COVID-19 crisis. Joint EIF – Invest Europe study. First online 23 September 2021. http://www.eif.org/news_centre/research/index.htm
- ECB (2023). Survey on the Access to Finance of Enterprises in the euro area October 2022 to March 2023.
- EIB (2022). EIB Investment Survey 2022. European Union Overview. November 2022.
- EIB (2023). EIB Investment Report 2022/2023. February 2023.
- EMN (2012). Overview of the Microcredit Sector in the European Union 2010-2011. European Microfinance Network (EMN). 27.12.2012.
- EMN (2018). Assessing The European Market Potential of Business Microcredit and the Associated Funding Needs of Non-Bank MFIs. February 2018.
- EMN-MFC (2022). Microfinance in Europe: Survey Report 2020-2021.
- European Commission (2011). Social Business Initiative, COM/2011/0682.
- European Commission (2022). Survey on the access to finance of enterprises (SAFE). Analytical Report 2022. December 2022.
- GEM (2019). 2018/2019 Global Report. Global entrepreneurship monitor.
- Gvetadze S., Kraemer-Eis, H., Lang, F., Prencipe, D., Signore, S., & Torfs, W. (2018). EIF SME Access to Finance Index. EIF Working Paper 2018/47. EIF Research & Market Analysis. January 2018. http://www.eif.org/news_centre/research/index.htm
- Kraemer-Eis, H., Botsari, A., Gvetadze, S., Lang, F., & Torfs, W. (2023). European Small Business Finance Outlook. EIF Working Paper. EIF Research & Market Analysis. Forthcoming.
- Torfs, W. (2023). The 2022 EIF SME Access to Finance Index August 2023 update. EIF Working Paper 2023/92, EIF Research & Market Analysis. http://www.eif.org/news_centre/research/index.htm

Annex: EIBIS 2023 country profiles

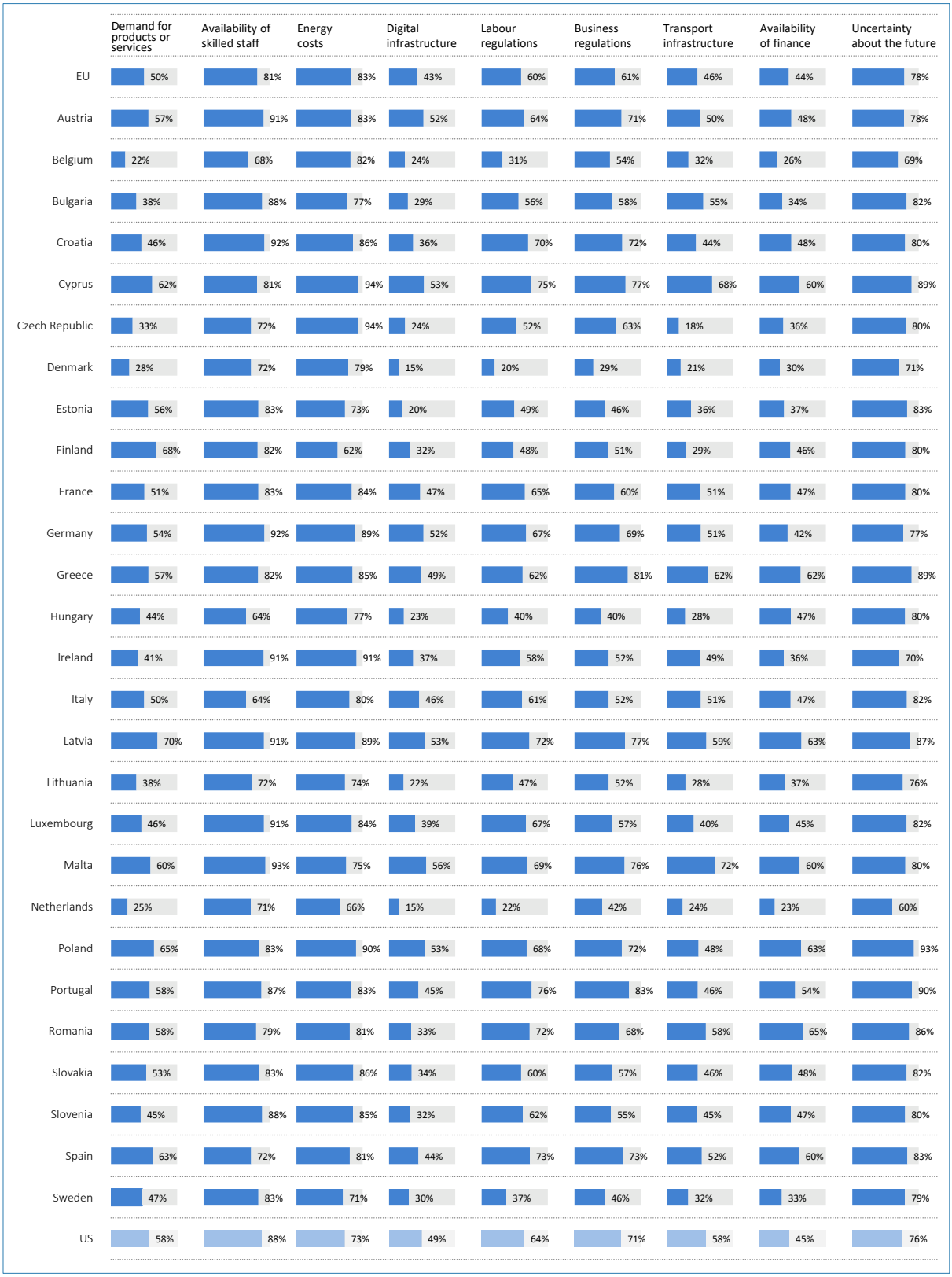
This section gives an overview of the different EU countries on some of the main indicators of **EIBIS**, as presented in this report.

Figure 1. Investment cycle and evolution of investment expectations by country



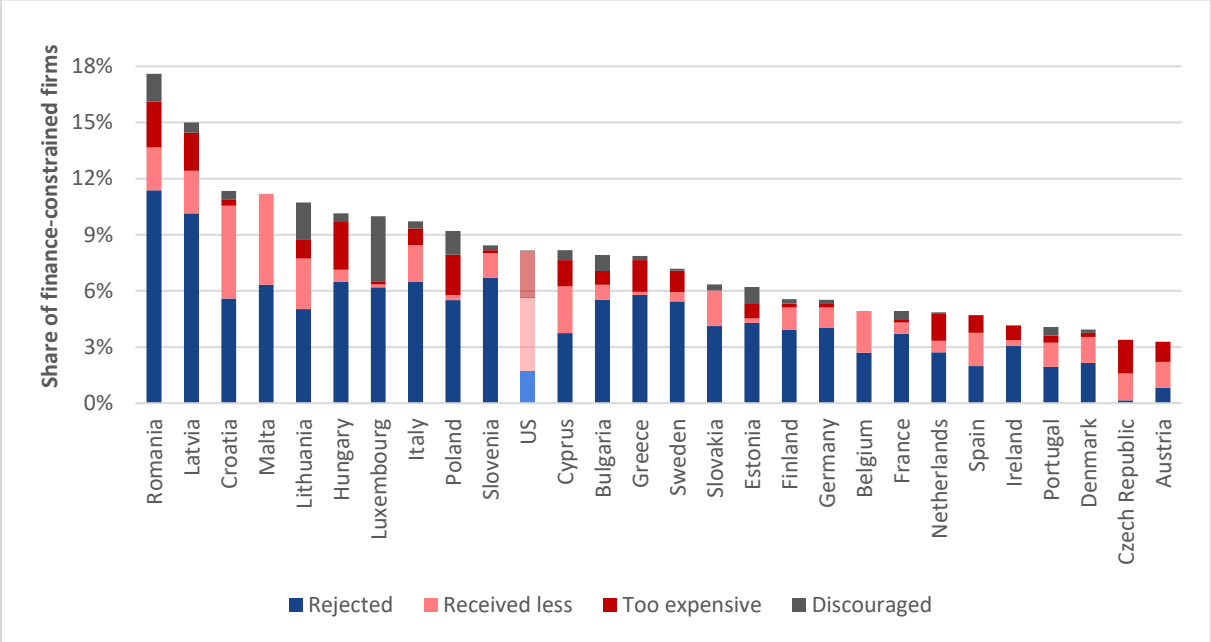
Source: EIBIS 2023
Share of firms investing shows the percentage of firms with investment per employee greater than €500. The y-axis line crosses the x-axis on the EU average for EIBIS 2023.
Base: All firms (excluding don't know/refused responses)

Figure 2. Long-term barriers to investment by country



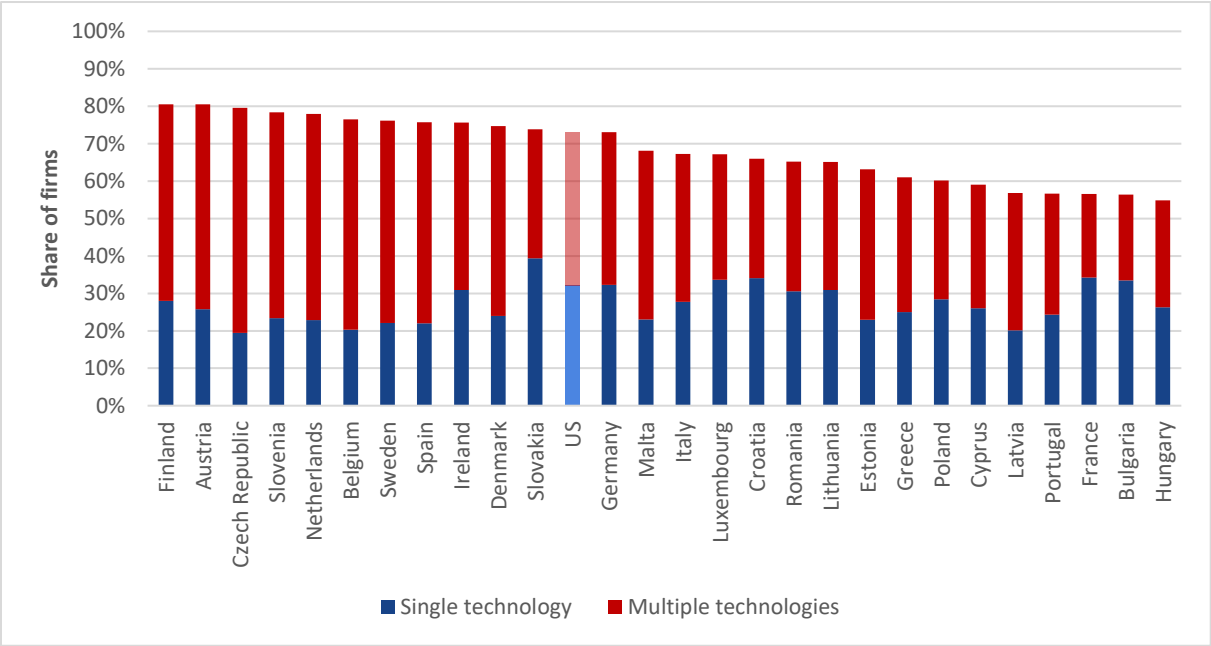
Source: EIBIS 2023
Question: Thinking about your investment activities, to what extent is each of the following an obstacle? Is it a major obstacle, a minor obstacle or not an obstacle at all?
Base: All firms (data not shown for those that said not an obstacle at all/don't know/refused)

Figure 3. Share of finance-constrained firms by country



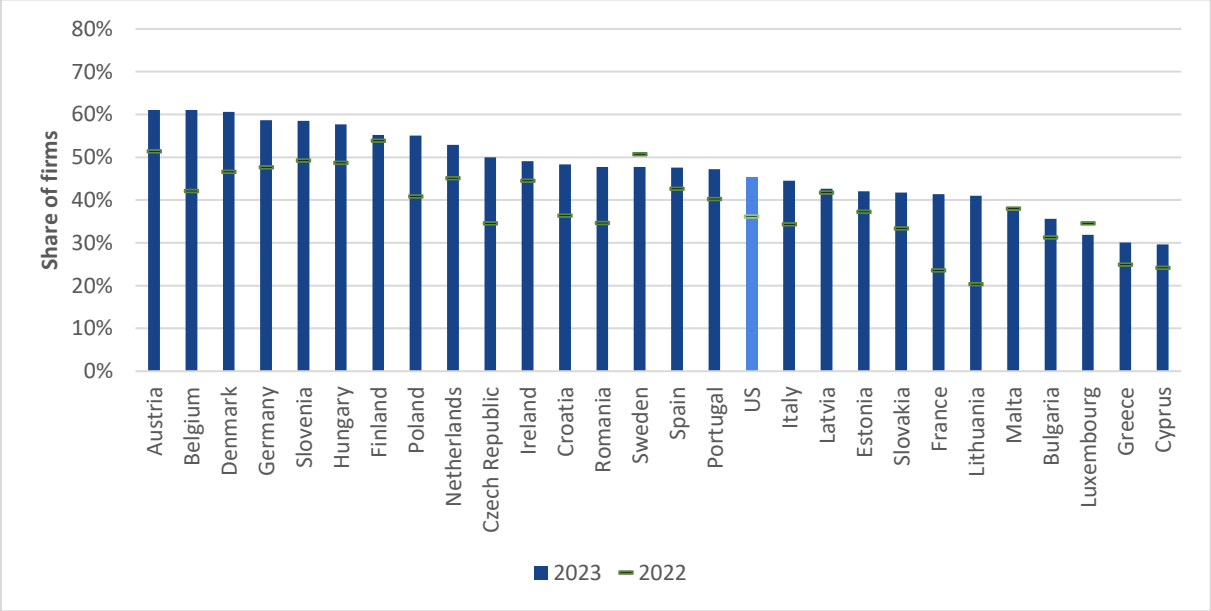
Source: EIBIS 2023
Note: Finance-constrained firms include those dissatisfied with the amount of finance obtained (received less), firms that sought external finance but did not receive it (rejected) and those that did not seek external finance because they thought borrowing costs would be too high (too expensive) or they would be turned down (discouraged).
Base: All firms (excluding don't know/refused responses)

Figure 4. Use of advanced digital technologies by country



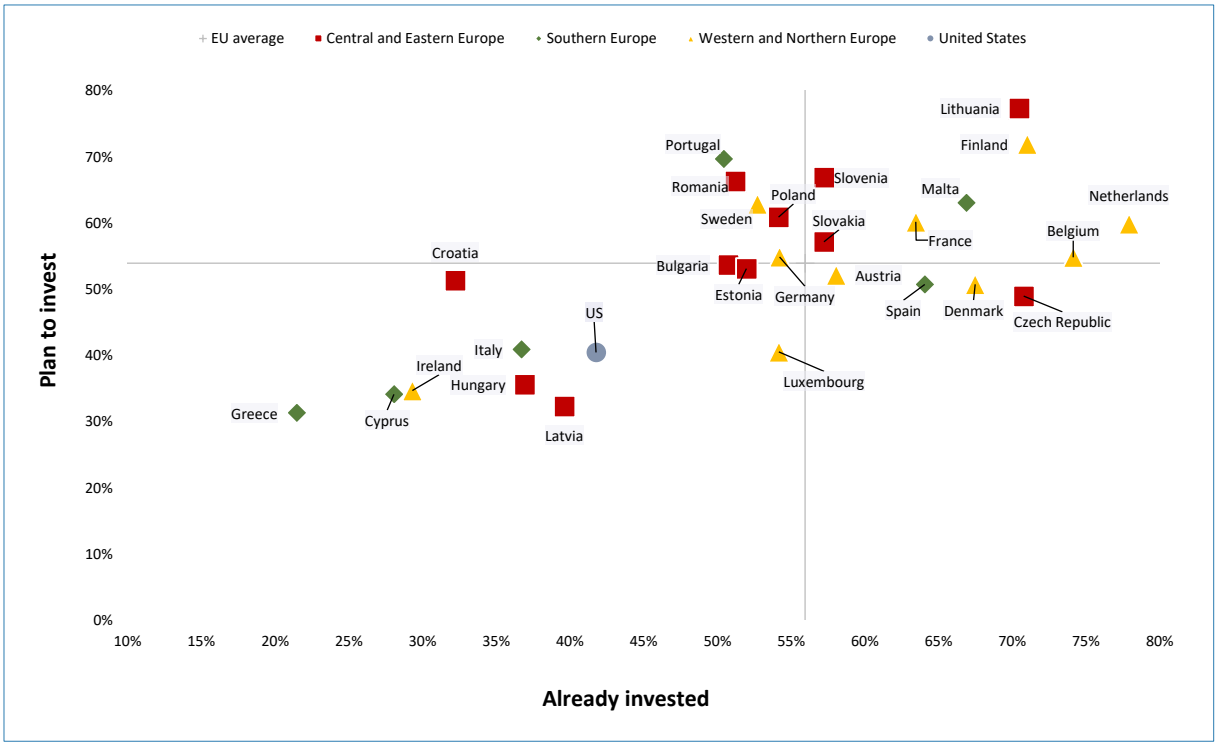
Source: EIBIS 2023
Question: To what extent, if at all, are each of the following digital technologies used within your business? Please say if you do not use the technology within your business.
Note: Reported shares combine used technology "in parts of business" and "entire business organised around it."
Single technology is where firms have used one of the technologies asked about. Multiple technologies refers to where firms have used more than one of the technologies asked about.
Base: All firms (excluding don't know/refused responses)

Figure 5. Share of firms investing in measures to improve energy efficiency by country



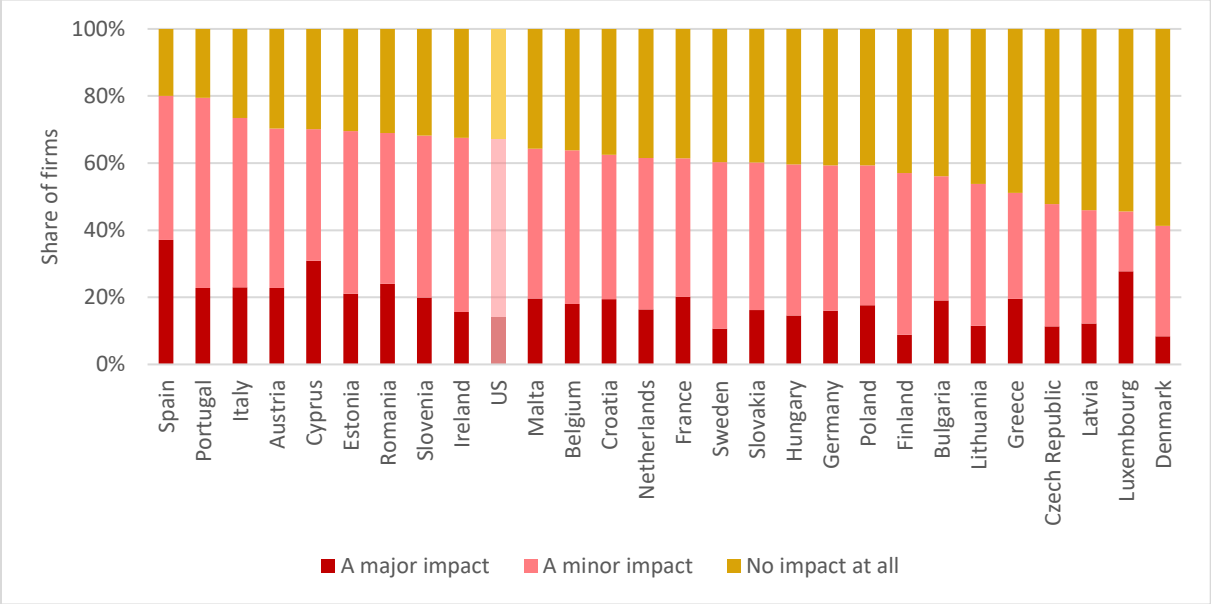
Source: EIBIS 2023
Question: What proportion of the total investment in the last financial year was primarily for measures to improve energy efficiency in your organisation?
Base: All firms

Figure 6. Investment plans to tackle climate change impact by country



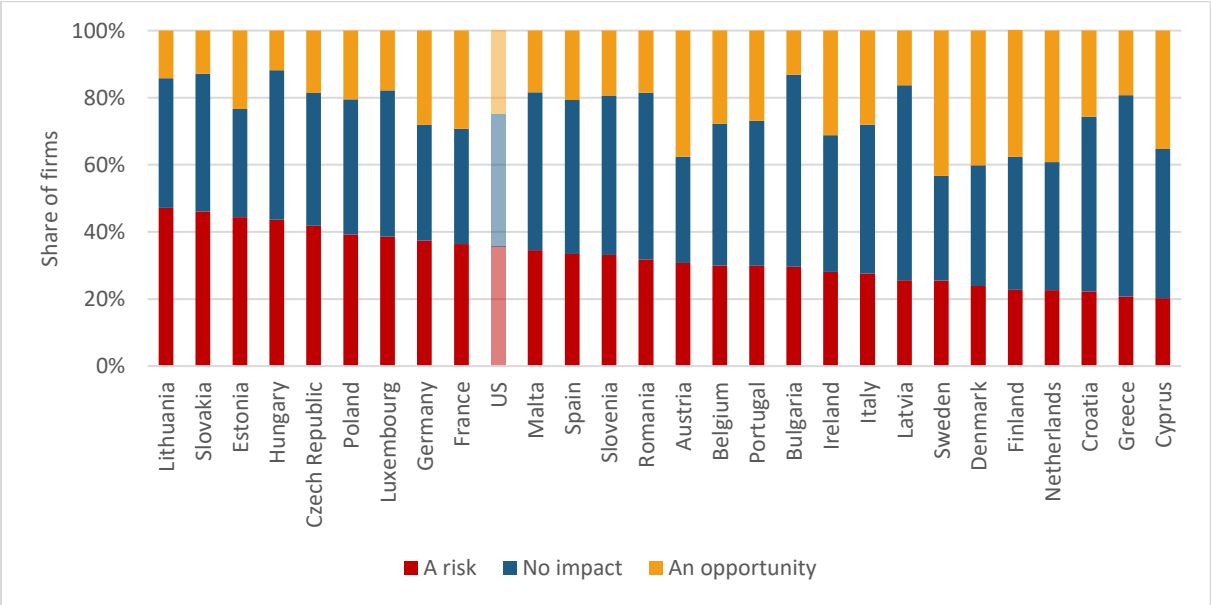
Source: EIBIS 2023
Question: Which of the following applies to your company regarding investments to tackle the impacts of weather events and to help reduce carbon emissions?
Note: The y-axis line crosses the x-axis on the EU average for EIBIS 2023.
Base: All firms (excluding don't know/refused responses)

Figure 7. Impact of climate change – physical risk by country



Source: EIBIS 2023
Question: Thinking about the impact of climate change on your company, such as losses due to extreme climate events, including droughts, flooding, wildfires or storms or changes in weather patterns due to progressively increasing temperature and rainfall. What is the impact, also called physical risk, of this on your company?
Base: All firms (excluding don't know/refused responses)

Figure 8. Impact of climate change – risks associated with the transition to a net zero emission economy over the next five years by country



Source: EIBIS 2023
Question: Thinking about your company, what impact do you expect this transition to stricter climate standards and regulations will have on your company over the next five years?
Base: All firms (excluding don't know/refused responses)

Investment barriers in the European Union 2023

A report by the European Investment Bank Group

European Investment Bank
98-100, boulevard Konrad Adenauer
L-2950 Luxembourg
+352 4379-1
www.eib.org – info@eib.org

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