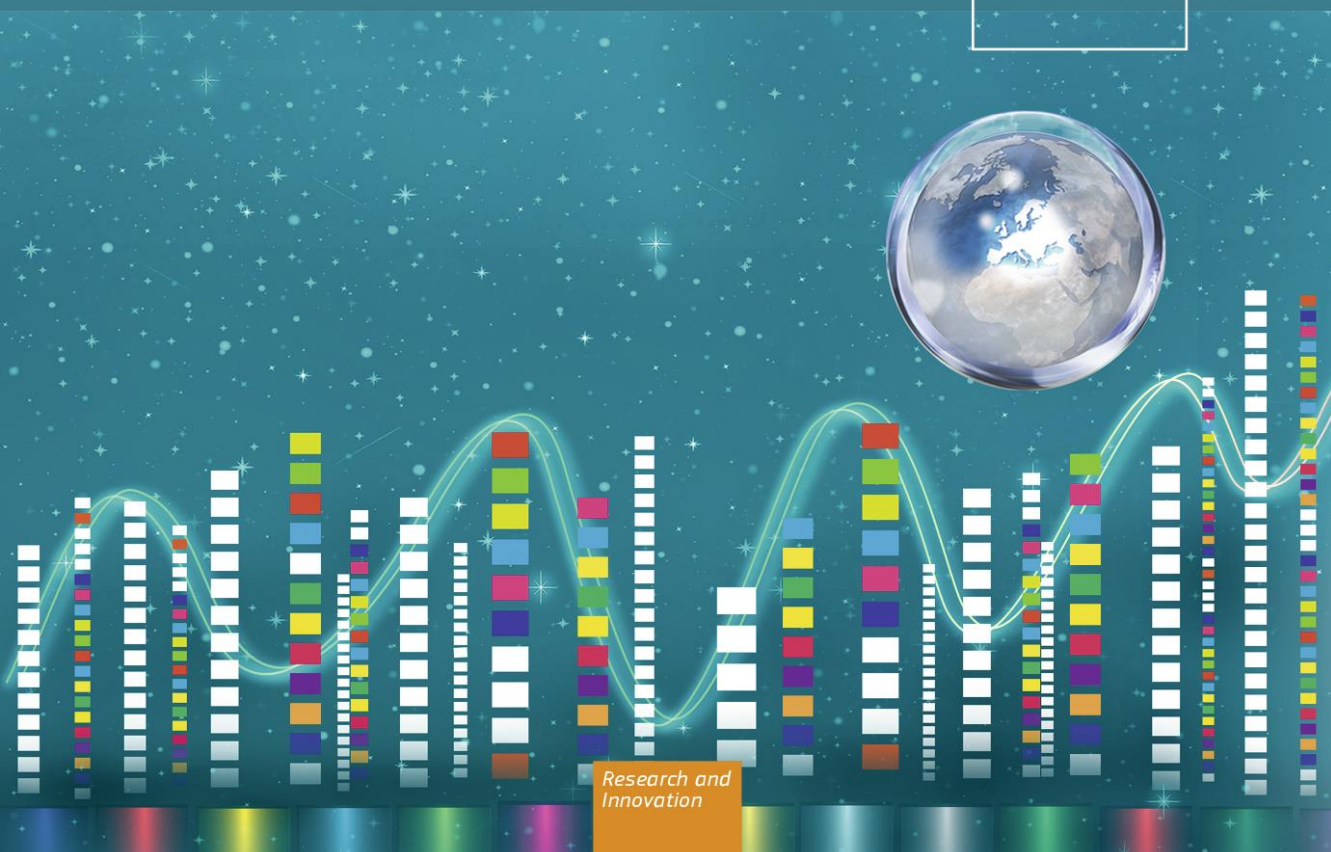
European Commission

Evaluation study on the European Innovation Council (EIC) Pilot

Final Report

Independent
Expert
Report



Research and Innovation

Evaluation study on the European Innovation Council (EIC) Pilot

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Evaluation study on the European Innovation Council (EIC) Pilot

Final Report

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Table of Contents

List of figures

LIST OF ABBREVIATIONS

BAS	Business Acceleration Services
CRL	Commercial Readiness Level
DG RTD	Directorate-General for Research and Innovation
DiD	Difference-in-Difference
EEN	Enterprise Europe Network
EIC	European Innovation Council
EISMEA	European Innovation Council and SMEs Executive Agency
EIB	European Investment Bank
EIF	European Investment Fund
EIT	European Institute of Innovation and Technology
ERA	European Research Area
ERC	European Research Council
ESIF	European Structural and Investment Fund
FET	Future of Emerging Technologies
FTI	Fast Track to Innovation
JRC	Joint Research Centre
KICs	Knowledge Innovation Communities
KPIs	Key Performance Indicators
IP	Intellectual Property
MoU	Memorandum of Understanding
SDGs	Sustainable Development Goals
SoE	Seal of Excellence
SME	Small and Medium Enterprises
SMEI	SME Instrument
R&I	Research and Innovation
TRL	Technology Readiness Level
VC	Venture Capital

EXECUTIVE SUMMARY

Evaluation objective and methodology

This study assesses the performance of the European Innovation Council (EIC) Pilot (2018-2020) against its objective of supporting breakthrough innovation and the scaling up of European deep-tech start-ups. The study looks at how the programme was delivered and at the early results that have been achieved to identify valuable lessons for improving the fully-fledged EIC in Horizon Europe (2021-2027).

The evaluation tested the soundness of the programme's intervention logic and institutional setup, the programme's ability to adapt and address emerging needs, its capacity to attract talents throughout Europe and deliver efficiently and effectively. It also looks at the programme coherence within the overall European research and innovation (R&I) policy mix and its European added value. For this purpose, the evaluation combined and triangulated different sources of quantitative and qualitative data that were collected and analysed through many methods (portfolio analysis, case studies, interviews, desk review and survey).

This evaluation was carried out while most projects funded by the EIC were still in progress, with some of them having started only recently. Consequently, the results presented are still preliminary and focused on the short-term benefits of the Pilot. The evaluation also had to grapple with the many novelties introduced with the launch of the EIC Enhanced Pilot in 2019 and the transition to a fully-fledged EIC in Horizon Europe, which was out of scope for this study.

EIC Programme implementation overview

The first phase of the EIC pilot was launched on 27th October 2017 as part of the Horizon 2020 Work Programme 2018-2020 and aimed to strengthen breakthrough, disruptive innovations and sustain the scaling-up of European high-growth innovative companies. To this end, the EIC Pilot brought together pre-existing Horizon 2020 instruments: the Future Emerging Technologies Open (FET), the SME Instrument (SMEI), the Fast Track to Innovation (FTI) and Horizon 2020 Prizes.[1]

The FET transitioned to the EIC Pathfinder Pilot, providing grants to international consortia undertaking cutting-edge research on radically new technologies with a very low level of technological maturity. The SMEI evolved into the EIC Accelerator Pilot to create and promote co-investment for enterprises undertaking radically new, high-risk, market-creating, and non-bankable innovation projects with scale-up potential. Starting from July 2020, the EIC Fund was established to offer Accelerator's beneficiaries the possibility to apply for

[1] The FTI and Horizon 2020 Prizes are outside the scope of this study.

equity or quasi-equity investment in addition to the EIC grant (blended finance option).

Between 2018 and 2020, the EIC Pilot funded 330 Pathfinder projects and 776 Accelerator projects. The number of proposals received by the Accelerator for each cut-off date increased over time, showing a progressive uptake of the programme, but the success rate decreased as a consequence (from 5 to less than 1 per cent). Applications for the Pathfinder were also numerous, with variable success rates (between 6 and 50 per cent) depending on the budget available for the different types of actions.

Overall, the organisations based in highly innovative regions were more successful when applying for the EIC Pilot, replicating a spatial distribution of funding that had been observed in previous assessments of Horizon 2020 and the FP7. Compared to the SMEI, applicants from a few associated countries (Norway, Switzerland and Israel) were particularly successful, whereas the EIC proved to be less accessible for entities based in EU-13. The geographical distribution of participants in the Pathfinder mirrors the spatial patterns of participation in the FET programme, with a high concentration of participants in a few countries and regions that are at the centre of well-developed innovation ecosystems.

Relevance and fit for the purpose of the novelties piloted in the EIC

The EIC Pilot met the objective of reorienting the FP support for innovation by designing a programme that integrates and connects science with innovation and provides funding for scaling-up. By bringing together the FET and SMEI, the EIC sharpened its focus on deep tech and shifted away from incremental and digitally driven innovation, for which there is already significant public support and private investments. Through the establishment of the EIC Fund, it tackles market failures, such as the insufficient volume of private equity investments in sectors and technologies relevant to addressing the climate and environmental crisis.

The mix of instruments that have been set out to accelerate the transition and time to market objectives is well-designed, and it considers that innovation development and market deployment can occur in multiple ways. The experience of the US DARPA inspired the proactive programme management approach. This evaluation could not fully assess this process since the programme managers were still being recruited and their roles defined at the time of this evaluation. The operationalisation of this approach will be an important aspect of future evaluations.

The bottom-up approach pursued by the EIC Pilot delivered a diversified project portfolio cutting across different scientific, technological, sectoral and application fields. Projects included in the EIC portfolio include both emerging deep tech technologies, such as AI, quantum computing, photonics, blockchain, biotech, robotics and advanced materials, along with expanding application fields such as electric and autonomous vehicles. The Pathfinder portfolio is well-positioned to nurture breakthrough innovations in cutting edge technologies, including in speculative technologies where Europe’s position is strong (e.g., plant communication, spintronics, bioelectronics, aluminium-ion batteries, airborne

wind turbines, artificial photosynthesis). EU policy priorities for transitioning to a green, digital and healthy society are also well addressed by the project portfolio of the EIC Pilot.

The EIC Fund is underpinned by well-justified public policy goals and market needs, but in the early stage, there were problems in understanding its rules and procedures. The blended finance option seems particularly relevant for deep tech start-ups, which need considerable resources to step up their research. A contentious point on the Fund's functioning pivoted around the interpretation of the non-bankability and co-investment criteria, whose complementarity and rationale were not fully understood by stakeholders. Clarifications on how to interpret and apply the two criteria require further communication through national contact points, business and start-up associations.

Efficiency in the implementation of the EIC Pilot

The Accelerator has successfully attracted fast-moving and young companies that were new to the framework programme for research (FP), whereas newcomers were in lower numbers in the Pathfinder. SME participation in the Accelerator was a continuum to the SMEI albeit with new modalities. The participation pattern of the Pathfinder showed a geographical concentration and the pivotal role of a few organisations in setting up consortia for accessing Pathfinder funding. This was particularly the case for large and decentralised organisations that were able to involve different teams in multiple Pathfinder projects.

Application to the Pilot overwhelmingly came from the most dynamic and innovative European regions, showing that the Pilot was less accessible for entities located in EU widening countries. In less developed regions, there are not yet the conditions to generate a critical volume of high-quality applications. Unlike traditional start-ups, deep tech companies require complex ecosystems to thrive. Support provided by national contact points and national programmes also made a large difference in generating interest and capacity for applying to the EIC.

For the Accelerator, the low success rates were not commensurate to the effort and cost involved in applying for the EIC Pilot. Oversubscription is a problem that the EIC inherited from the SMEI and a sign that demand is higher than the available resources. Because of budget limitations, too many high quality proposals were left without EIC financing, generating the perception that the outcome of the selection was too dependent on luck. Most Accelerator applicants recruited specialised consultants to navigate the application process, but this strategy was not sufficient to ensure success. Further simplification of the application process is probably needed to lower barriers to SME participation. A positive change has already been implemented in Horizon Europe, where the new rules for applying to the EIC are based on a two-staged process that reduces the number of unsuitable proposals that reach the full proposal stage.

Grant funding flowed well, but the recurrent delays in approving the beneficiaries that applied for the blended finance instrument have been detrimental to the reputation of the EIC Fund. Companies that were proposed for financing by the

EIC Fund had to deal with a lengthy decision process. Although there has been good progress in reducing the delays of the Fund's financing decision, this process still takes too long, it creates uncertainty for the companies proposed for the equity investment and raises some questions about the EIC's ability to act quickly for supporting fast growing companies.

Continuous changes during the Pilot have taken stakeholders aback, but the understanding of the EIC's specific features has improved during the pilot phase. The SMEI was already a new instrument in Horizon 2020, and the transition to a different programme configuration took many applicants and support services unprepared. Initially, the focus on deep tech and disruptive innovation was not well understood. Applicants also had problems understanding that, through the EIC Fund, the programme was transitioning from a grant and subsidy-based funding to an equity based funding model.

Early signs of the impact of the EIC Pilot

This evaluation identified early signs of progress, but a more complete assessment of the programme's impact requires a longer timeframe. Data on Accelerator beneficiaries show that the selected companies were on a growing path. However, the positive performance shown by data on multiples, turnover and employment may be the result of the immediate effects of the support received and will have to be confirmed by future evaluations. A longer timeframe is also needed for an assessment of the EIC Pilot's contribution to societal and technology objectives and for assessing the full scale of the impacts of the novelties introduced by the EIC in the FP.

The positioning of the EIC Pilot within the EU and Member states' R&I policy mix and its European added value

Within Horizon 2020, the EIC Pilot had a unique target and configuration that set the EIC up to respond to needs that were not addressed by other parts of the FP. Overlaps were limited to the area of the provision of business and training services by the EIC Business Acceleration Services. Synergies with other parts of Horizon 2020 Europe and other EU programmes were based on past schemes (Seal of Excellence for the European Structural and Investment Funds), while a Memorandum of Understanding was signed in 2021 with the European Institute of Innovation and Technology (EIT) to frame the collaboration between the two programmes.

In the national policy landscape, the EIC stands out as the only programme having sufficient breadth and scale to make a difference. The European dimension of the programme, the sizeable funding, the EIC reputation and the focus on disruptive innovation and breakthrough technologies generate significant benefits that cannot be delivered by national programmes. In most cases, without the EIC financial support, projects would not have been implemented or would have been continued only on a smaller scale.

Lessons learnt and the way forward

The lessons learnt by this evaluation focus on three main areas of improvement for the EIC.

Lesson 1. There is scope for improving the offer of training and coaching services under the Business Acceleration Services.

When collecting stakeholders' opinions, this evaluation found a modest European added value and complementarity for the training and coaching services offered by the Business Acceleration Services, while there was a perception of higher values for other services such as matchmaking events (meet the corporate/procures). In particular, the need to align the offer of these services to participants' needs and expectations has emerged, alongside the availability of similar services through national and other European programmes. Partnerships with other instruments in Horizon Europe, such as the EIT, have already been established and constitute a good example for building synergies and complementarities with existing programmes.

Lesson 2. The EIC Fund should continue to consolidate its credibility by shortening the time-to-finance decision and effective communication.

The Fund can play an important role in catalysing investments in areas that are underinvested by private investors but, to fully meet its objectives and reduce uncertainty for beneficiaries, it needs to considerably speed up the process leading to the signature of the financing agreement. In the pilot phase, delays were due to the novelty of the instrument, both for the EC and the beneficiaries, whereas in the current programming period there were legal difficulties in transitioning the Fund under Horizon Europe. Although some of the initial difficulties have been addressed and delays reduced during the pilot, the operations of the Fund have been delayed in the transition to Horizon Europe which negatively affected the Fund's reputation. Stakeholders' expectations about the benefits and implications of receiving the Fund's support could be managed by further communication through national contact points, SME and start-up associations.

Lesson 3. The EIC Pilot's impact assessment framework does not fully align with Horizon Europe's impact assessment framework.

The EIC impact assessment framework was developed by the EIC pilot Advisory Board in the Pilot phase to complement the FP assessment framework, and focused on new areas to capture the programmes' objectives, including its support for scale-ups. However, when assessing all EIC Pilot components, this evaluation had to add specific KPIs from the FP assessment framework to report on scientific and technological progress alongside economic performance. The transition from research to the market is an important objective of the EIC that is not currently covered by specific indicators of achievements, such as TRL progression or the number of spinoff companies. Economic impacts indicators are relevant for the Accelerator, but cannot be used for Pathfinder projects.

The EIC Pilot has made commendable efforts in trying to achieve more balanced participation, especially for women. Good examples of these initiatives include the Women TechEU and the Women Leadership Programme, along with gender-balanced jury composition. Nevertheless, identifying attraction and inclusiveness as the programme's KPIs creates possible conflicts with the award criteria for project selection and in particular with excellence in science and innovation. The promotion of more geographically and gender-balanced participation in Horizon 2020, as well as in Horizon Europe, are cross-cutting objectives reflecting the FP's goal to foster participation from all groups and eligible countries, whereas specific measures are designed to enhance wider participation (e.g. by strengthening innovation systems).

The analysis of the societal impacts should consider the time that is needed for the materialisation of these effects that are hardly observed in the short period. Actual impacts can be measured through bibliometric and patent analysis once the technology applications have become clear. Finally, economic impact targets could be designed to integrate success alongside failure, for instance by identifying the share of the portfolio that is expected to achieve high growth and significant catalytic effects instead of using averages across the entire portfolio.

INTRODUCTION

This chapter presents the evaluation objectives and summarises the methodological approach. Several technical annexes have been developed to illustrate better how the different research tools contributed to the evaluation findings.

Purpose of the evaluation

The objective of this study is to undertake an evaluation of the European Innovation Council Pilot to inform the ex-post evaluation of Horizon 2020 with respect to EU support for breakthrough innovation and the scaling up of European start-ups. This evaluation aims to assess the overall implementation of the EIC Pilot and Enhanced Pilot by looking at how the programme was delivered and at the early results that have been achieved. The evaluation seeks to identify early barriers and drivers to deliver on the EIC Pilot objectives with the purpose of learning lessons that may help to improve the fully-fledged EIC in Horizon Europe (2021-2027).

The study focuses on the evaluation criteria defined in the EU Better Regulation Guidelines (Relevance, Coherence, Effectiveness, Efficiency, and EU added value) and addresses these in terms of the following questions:

- How relevant is the EIC programme design with respect to the objectives assigned to it?
- What results have been achieved so far, and what are the determinants of performance?
- To what extent have the EIC governance and management features been adequate to attract top researchers and innovators throughout Europe?
- How coherent is the EIC within the overall European research and innovation policy mix?
- Could the objectives of the EIC be achieved in another way?
- What lessons can be learnt from the implementation of the EIC pilot?

In addition to the above questions, the study looked closely at the lessons that could be learned from the Pilot in relation to the following aspects: i) transition from research to innovation, ii) participation of women innovators, iii) participation from "widening countries"[2] and iv) synergies between the EIC and the EIT.

[2] Countries that are low performing in the area of research and innovation (70% of the EU average) are considered to be Widening countries. Under Horizon 2020 these countries

Scope of the evaluation

This study covers the implementation of the EIC Pilot (2018-2020 EIC Pilot Work Programme) since its launch in 2018, including all the calls that were launched between 2018 and 2020.[3] It includes the EIC Accelerator (past SME Instrument, Phase II only), the EIC Pathfinder (past Future & Emerging Technologies, Open and Proactive, including the FET Innovation Launchpad). Over this period, the study assesses all the novelties that have been gradually introduced under the EIC enhanced Pilot, including the blended finance instrument (EIC Fund) that combines grants with equity financing. However, the Fast Track to Innovation and the EIC prizes were not included in this evaluation's scope.

The table below illustrates the volume of financing and the number of projects that were involved in the piloting of the EIC.

Table 1. Overview of participation in the EIC Pilot (2018-2020)

	EU contribution amount (€)	N. of projects	N. of participants	N. of unique participants	Avg. number of participants per project
Pathfinder *(including Launchpad)*	843 554 363	330	1878	917	6
Launchpad	*7 391 986*	*74*	*136*	*102*	*1,8*
Accelerator	1 445 751 362	776	776	768	1

Note: Only project coordinators are considered in the analyses of the Accelerator. In this way, changes in the legal status of the companies do not affect the overall figures. The number of unique participants in the Pathfinder overall excludes the duplication of participants between the Launchpad and the other Pathfinder schemes (61 participants are in common).

Methodology overview

The evaluation design was set to assess the determinants of impact and the extent to which the EIC Pilot institutional and organisational framework was fit for purpose, reflecting the status of implementation of the programme and the short life span of the pilot phase. This involved assessing whether the programme's implementation framework was suitable for delivering the expected results in terms of increased innovation, increased market access, scaling-up, diversity and accessibility.

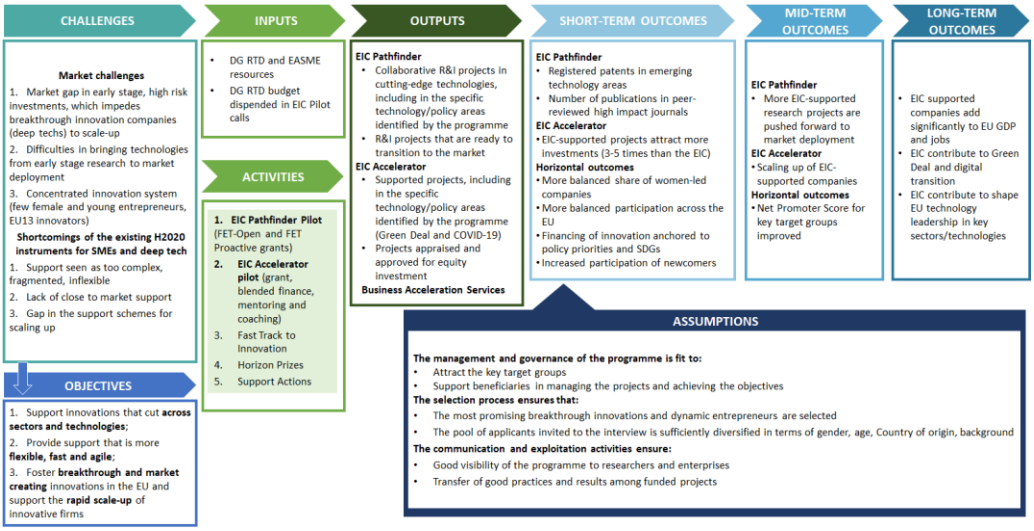
The EIC Pilot intervention logic was developed (Figure 1) to reconstruct the expected chain of results and the respective key performance indicators (KPIs)

included: Bulgaria, Croatia, Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. The list of countries was modified under Horizon Europe and now includes: Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia; plus the outermost regions: Guadeloupe, French Guiana, Réunion, Martinique, Mayotte and Saint-Martin (France), and the Canary Islands (Spain).

[3] For the FET Proactive, only 2019 and 2020 calls are considered part of the EIC Pilot.

as defined by the EIC Vision Statement[4]. The evaluation matrix included in the ToR detailed a large number of evaluation questions that had to be addressed by different research tools (see Technical Annex).

Figure 1. The EIC Intervention logic



CSIL based EIC Pilot work programme 2020-2022

The evaluation strategy was structured in three phases to ensure the technical quality of the work and the validity of the conclusions:

- A broad and robust data collection and analysis strategy based on mixed research methods to fully address the evaluation questions while combining the macro (policy and instrument level) and micro (project level) perspectives (Evaluation Matrix in the Technical Annex).

- Triangulation and cross-referencing of evidence to draw solid conclusions and deliver a fair and nuanced judgment (Evidence Table in the Technical Annex).

- A policy workshop to validate the evaluation findings and lessons learnt and place them within the broader context of the fully-fledged EIC, which has been running since March 2021 (Workshop proceedings in the Technical Annex).

The data collection and analysis were organised in terms of the following five tasks.

[4] EIC Independent Expert Report (2020). A Vision and Roadmap for Impact. Independent report by the EIC pilot Advisory Board

- A portfolio analysis looking at information on applicants, beneficiaries and projects by combining data from multiple sources (Horizon 2020 monitoring data, Dealroom, Pitchbook, Orbis and Orbis IP, and the Innovation Radar). Data was analysed through various methods, including text clustering and content analysis of proposals' summaries, network analysis, cluster and counterfactual analysis.

- Semi-structured strategic interviews with selected stakeholders representing a cross-section of the interests of the Member States, the European Commission and the programme's beneficiaries. The methodological Annex includes a list of the organisations that contributed with their opinions to this evaluation.

- A survey of successful and (high-quality) unsuccessful applicants, gathering the opinions of 1141 respondents with good geographical coverage of EU and Associated countries. Survey results and methodology are described in Annex.

- Case studies (15 distributed between the Accelerator, Pathfinder and Launchpad) aimed at casting light on project results and success factors. A meta-analysis of case studies is included in Annex.

- A desk review consisting of literature focusing on impact analysis of public support for innovation (through grants or financial instruments) and technology foresight to inform the methodological design of this evaluation, and on policy documents to help to consider the EIC Pilot within the broader context. The desk review also extended to the available project documents in the case studies.

More information on the data collection tools and the analysis performed are provided in the methodological Annex.

It is important to stress that the evaluation was carried out while most projects funded by the Accelerator (88%) and the Pathfinder (95%) were still in progress, with some of them having started only recently. This means that the results presented are still preliminary and focused on the short-term benefits of the programme, whereas medium and long-term impacts are yet to emerge, and it will only be possible to assess them in the future. Nonetheless, an important contribution of this evaluation has been to test different KPIs and methodologies that may be further developed in future programme assessments.

The evaluation also had to grapple with the many novelties introduced in a short time with the subsequent launch of the EIC Enhanced Pilot in 2019 and the fact that some of the changes introduced were not completed by the end of 2020. The full impacts of these changes were not yet visible for this evaluation. Changes introduced after 2021 are out of scope for this evaluation but have been considered in the conclusions to account for the programme's progress and its ability to learn and adapt to fully meet its multiple objectives.

EIC PILOT BACKGROUND

This chapter illustrates the market failures and gaps that led to the establishment of the EIC Pilot in 2018. It also briefly presents the EIC's main objectives, delivery mechanisms, and governance structure.

The needs addressed by the programme

Europe excels in science but underperforms in translating scientific discoveries into innovation. Already in 1995, the Green paper on Innovation addressed this issue as "the European paradox", stating that "one of Europe's major weaknesses lies in its inferiority in terms of transforming the results of technological research and skills into innovations and competitive advantages."[5] "A weak capacity to transform basic research results into marketable innovation" was one of the challenges underlying the design of the Seventh Framework Programme (FP7).[6] Nonetheless, the FP integrated innovation in its work programme only after 2010, when supporting the Innovation Union became one of the specific objectives to contribute to the EU economic recovery, growth and jobs. This dimension was further strengthened in Horizon 2020 with the establishment of the SMEI.

The lack of financing support is the most important barrier to innovation for SMEs, especially for young, fast-growing innovative firms. Europe's population of SMEs is highly heterogeneous, and the extent to which they are impacted by different barriers depends on the nature of the SMEs in question. Nonetheless, a recent study for the European Commission[7] has identified that the lack of financing support for RDI activities is considered by far the main barrier to innovation for SMEs of different sizes and involved in various types of activities. Yet, it is even more crucial for young, fast-growing, innovative SMEs, which are often unable to access funding to develop their business through the banking system. Innovative firms usually run more risky business models and tend to rely heavily on intangible assets. These features make it more difficult for banks and investors to assess the possible return on their investment. The inherent high risk underlying the business model of young innovative SMEs remains with the firm for a long period, from the time research and development activity is carried out to the time revenue streams are generated by the mature final product.

Where markets do not provide optimal results, government intervention is necessary to address the following market failures:

- **Asymmetric information** between the entrepreneur and the investor: the investors know less about the innovation (sometimes based on undisclosed

[5] European Commission, Green paper on Innovation, Bulletin of the European Union, Supplement 5/95, 1995.
[6] Ex-Post Evaluation of the Seventh Framework Programme, SWD(2016) 2 final.
[7] See CSES, CSIL, Prognos, KMFU (2021); *Study on the effectiveness of public innovation support for SMEs in Europe*, European Commission Brussels, pp.6-8 and Annex A

technology) and find it hard to work out which projects will be successful and to fund – which leads to higher financing costs.

- **High transaction costs**: the innovator/ entrepreneur might have to part with so much of his or her potential wealth to obtain funding that it is not considered worthwhile.

- **Coordination failure**: The venture capital market builds confidence and credibility on a pipeline of past successful projects. These, however, cannot materialise in young firms without sufficient funding. Public intervention may overcome this issue by acting as a first-mover to establish the equity markets for young firms.

- **Positive externalities** undervalued by private investors: private investors cannot fully appropriate the societal benefits of the innovation activities generated by the investee companies.[8]

These market failures result in innovative enterprises facing funding gaps known as the two "Valleys of Death". The Valley of Death is a funding gap that first hampers technology development (from R&D activities to prototyping) and later holds back commercialisation when entrepreneurs try to launch the product or service to the market. This mechanism occurs for both start-ups and established SMEs.

For some time, it has been recognised that there has been a gap – a lack of access to early-stage capital in the EU - and a relatively low level of EU performance in breakthrough innovations and commercialisation of research results. The evaluation of the SME Instrument in 2017 found that the situation had not changed significantly since its launch in 2014.[9] According to a recent report, the EU lags behind the United States in disruptive innovation, and Europe is falling behind in growing sectors and areas of innovation such as genomics, quantum computing, and artificial intelligence, where the United States and China are outpacing it. [10] These are all highly research-intensive sectors.

Furthermore, Europe's start-ups are still fewer, raise less money, and have a lower likelihood of success (defined as start-ups that reach Series C funding, go public, or are acquired) than in the USA. While Europe generates 36 per cent of all formally funded start-ups, it creates only 14 per cent of the world's unicorns. Adjusted for population and GDP, the number of seed-stage start-ups that Europe

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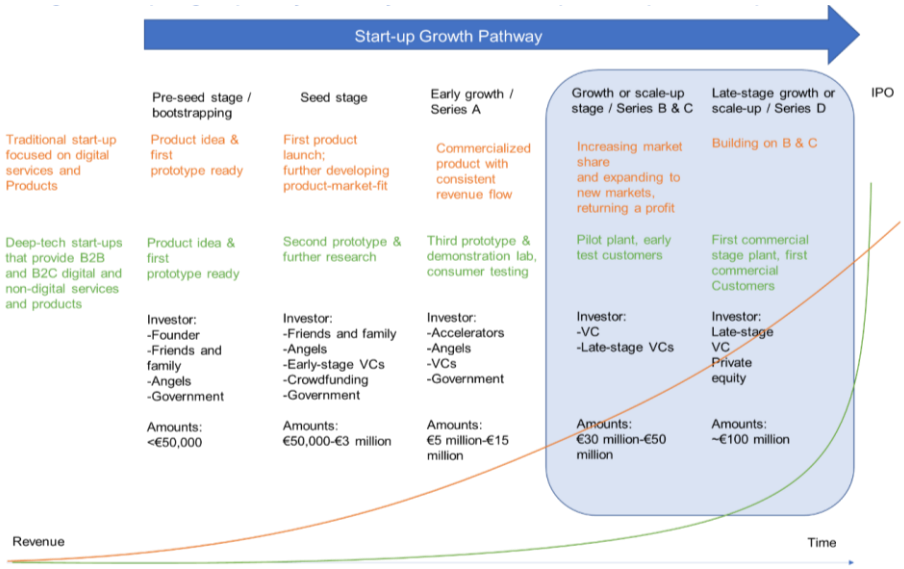
[8] The Innovation Policy Platform, *Policy rationales and objectives for innovative entrepreneurship*. Available at: https://www.innovationpolicyplatform.org/www.innovationpolicyplatform.org/printpdf/innovation_policy_platform_-_policy_rationales_and_objectives_for_innovative_entrepreneurship_-_2015-10-01/index.pdf

[9] Technopolis (2017); Evaluation of the SME instrument and the activities under Horizon 2020 Work Programme "Innovation in SMEs", p.1

[10] McKinsey & Company (2020); Europe's start-up ecosystem: Heating up, but still facing challenges, p.2.

generates is only 40 per cent of that generated by the United States.[11] According to the Deep tech 2020 Report[12], there is a €70 billion equity funding gap in the EU, leading to a substantial lack of finance for breakthrough and disruptive innovators in Europe. As a result, many European start-ups cannot find the high-risk capital needed to get to the stage where private sector investors get involved.

Figure 2. Comparing the pathway to maturity of traditional start-ups and deep tech start-ups



WEF, KPMG (2020); Bridging the Gap in European Scale-up Funding: The Green Imperative in an Unprecedented Time

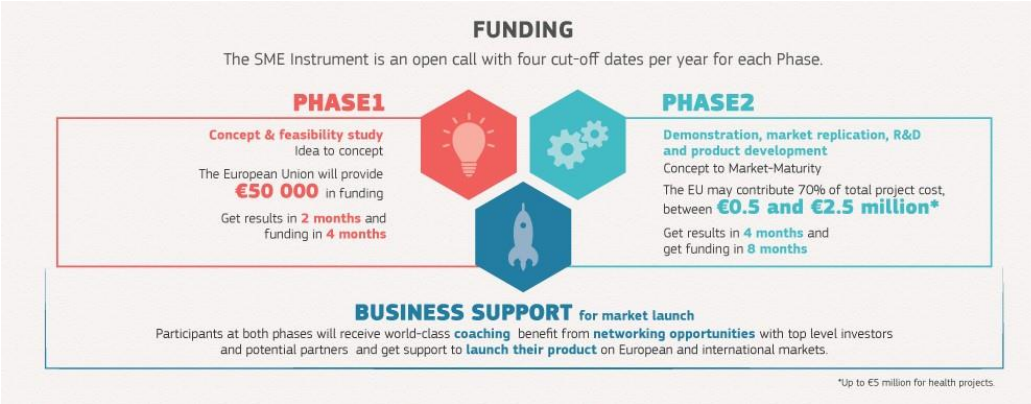
From the SME Instrument to the EIC Pilot

The SME Instrument (SMEI) was launched in 2014 to provide grants and business innovation support to individual companies within Horizon 2020. It responded to a lack of access to early-stage high-risk capital, with a view to the increasing commercialisation of innovations, in the context of the relatively low level of EU performance in breakthrough innovations compared to the USA and China. To this end, the programme was structured in three (not necessarily sequential) phases.

[11] McKinsey & Company (2020); Europe's start-up ecosystem: Heating up, but still facing challenges, p.2

[12] European Commission, DGRTD (2021); *Deep Tech Europe. EIC Pilot Impact Report, 2020*, p.24

Figure 3. The SMEI components



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The Mid Term Review of the SMEI found that the SMEI effectively reached SMEs that previously did not participate in the FP. Over the period 2014-2015, 89% of the SME applicants and 83% of those awarded under the SME Instrument were 'newcomers' to Horizon 2020. However, mid-term assessments have also identified some issues. In particular, a study performed by CSIL on Industrial Leadership for the European Parliament[13] highlighted the overall low success rate of applicants, especially in some thematic calls that were heavily oversubscribed, and the fact that the scheme was attracting well established SMEs with no clear focus on game-changing innovation. A 2020 review by the European Court of Auditors also questioned the additionality of the instrument given that 36% of respondents to sample of beneficiaries believed that their projects could have received funding from the private sector, and 17% replied that they could have used their company's resources to fund the relevant innovations.

Overall, the SMEI was not considered adequate to address the persistent difficulties that European start-ups and deep tech companies faced when pursuing breakthrough innovation and trying to grow. These unresolved issues led to rethinking the SMEI and setting up the EIC Pilot in 2018.

EIC Pilot objectives and implementation framework

The EIC Pilot was launched in 2018 to establish a new pilot initiative on breakthrough innovation during the remaining period of Horizon 2020, to set up a fully-fledged EIC for the next MFF (2021-2027). The program aimed to:

- Strengthen breakthrough innovations that are radically different from existing products or services and cut across sectors and technologies;

[13] Delponte L., Smit J. (2016). The implementation of Horizon 2020 – Industrial Leadership – EPRS/IMPT/SER/14/013/Lot4/3. Research and industry perspective.

- Boost the number of European high-growth companies.[14]

To achieve the above objectives, the programme grouped the SMEI with other Horizon 2020 programmes such as Future Emerging Technologies Open (FET Open) and Proactive (FET Proactive), Fast Track to Innovation (FTI)[15] and H2020 Prizes[16]. As a result, the EIC Pilot was articulated in two main schemes: the Accelerator (former SMEI) and the Pathfinder (former FET Open and Proactive) and was complemented by the FTI (Fast Track to Innovation) and the H2020 Prizes.

The **EIC Pathfinder Pilot** (TRL 1-3) was aimed at high-risk, cutting-edge research in new territories involving radical, innovative technologies. Consortia of at least three entities from three different Members States and Associated Countries could apply for Pathfinder grants. It pursued a thematic (FET Proactive call) and an open (FET Open) approach. It also included a scheme (FET Innovation Launchpad) to support short individual, or collaborative actions focused on non-scientific aspects to exploit the results of an ongoing or recently finished FET project.

Box 1. The EIC Pilot Pathfinder

- → Supports high-risk high-impact research
- → Interdisciplinary research, visionary technologies
- → Offers grants up to €3-4 million (transnational collaborative projects)
- → Open to all fields, but some topics are also targeted
- → Possible follow-up funding through EIC Transition and Accelerator
- → Access to EIC coaching, mentoring and networking to operationalise research results

The **EIC Accelerator Pilot** (TRL 6-8) built on the SMEI and aimed to create and promote co-investment where market support was insufficient. It targeted enterprises undertaking radically new, high-risk, breakthrough, market-creating, and non-bankable innovation projects with scale-up potential. Initially, the Accelerator Pilot continued the SMEI staged approach:

- Phase 1 (discontinued in June 2019): provided up to €50k over 6 months for a feasibility study to help understand the research and development required to lead to an innovation project (basic business plan).

- Phase 2 to develop the concept to become market-ready: the SMEI II provided grant–only support to SMEs carrying out high-risk innovation before the scaling-up phase. Starting in October 2019, successful proposals with activities up to TRL 8 were offered an EIC blended finance option combining the EIC grant with an equity investment, implemented by the EIC Fund. Close to market activities (i.e. TRL 9) could only receive an equity investment as long as the proposal remained non-bankable.

[14] Enhanced EIC Pilot Work Programme.
[15] Not in the scope of this evaluation.
[16] Not in the scope of this evaluation.

Box 2. The EIC Pilot Accelerator

→ Supports high-risk, high-potential SMEs
→ Provides grant funding of up to €2.5 million, 75% of the cost
→ Option of an equity investment of up to €15 million
→ All funding is open – no predefined thematic areas

Compared to the SMEI, the EIC Accelerator introduced important novelties, namely:

- A "bottom-up" approach with no predefined topics to encourage disruptive innovation which cuts across different scientific and technology fields and promotes cross-fertilisation amongst different disciplines.
- A focus on de-risking innovations developed by deep tech companies through the investments made by the EIC Fund.
- A new approach to the evaluation of proposals that included face-to-face interviews of applicants with juries of experienced innovators and investors. The interview was introduced to have a better idea of the soft skills of the team leading the projects.

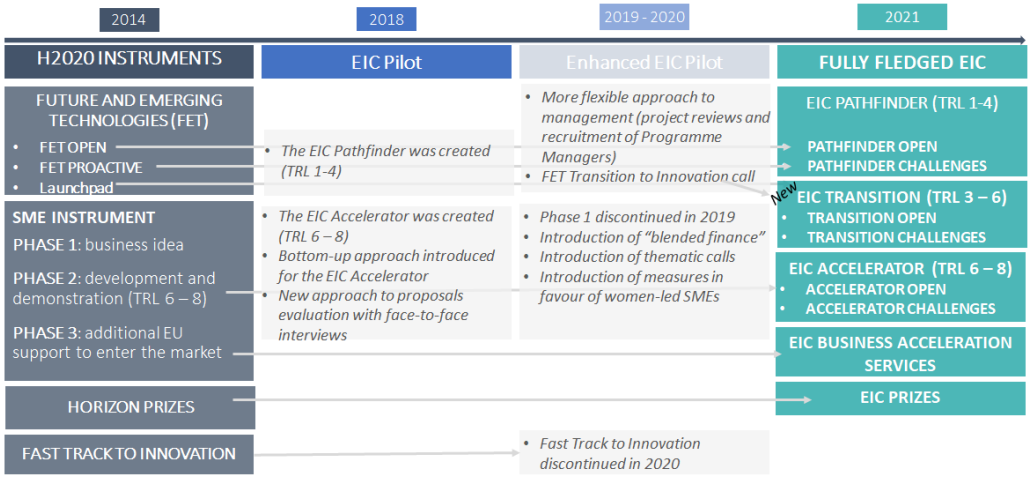
Deep tech refers to startups whose business model is based on high tech innovation in engineering processes. These companies share four common traits: i) they are problem-oriented, ii) they situate themselves at the convergence of technologies, iii) they focus on physical rather than digital innovation, and iv) they rely on deeply interconnected ecosystems.

Source: Boston Consulting Group

Beneficiaries of the Accelerator and Pathfinder could also benefit from business acceleration services (e.g. coaching and mentoring, matchmaking) provided through the EIC Community Platform.

Over two years (2018 – 2020), the EIC Pilot went through important changes that strengthened the programme's ambition and helped the transition towards the current EIC under the Innovative Europe pillar in Horizon Europe (Figure 4). In 2019 the European Commission launched the Enhanced EIC Pilot that introduced important novelties, including more proactive project portfolio management and support for scaling-up, whereas the EIC Accelerator Phase 1 was discontinued.

Figure 4. The EIC Pilot evolved over two years



CSIL

As part of the Pathfinder, a Transition to Innovation Activities call was launched in 2019. This call was meant to address the existing gap in the innovation spectrum between early-stage research and technology development for market exploitation. Projects financed under this call required further research and development to make the technology mature and needed to demonstrate an early entrepreneurial vision.

Following the DARPA model[17]**, programme managers were recruited to ensure a more proactive project portfolio management and to develop a vision for technological and innovation breakthroughs**. Four programme managers were appointed full-time for a period of up to four years within the EIC since June 2020 in the following technology fields: biotechnology and health, med-tech and medical devices, materials for energy and environment and energy systems.

The EIC Enhanced Pilot also aimed to promote diversity and introduced measures in favour of women-led enterprises. The Commission's view is that women are underrepresented in research and technology, while research suggests that companies with more mixed boards perform better.[18] The gender balance of the EIC portfolio is managed as an official KPI. The initiatives introduced with the Enhanced Pilot include i) efforts to achieve gender parity in the pool of expert evaluators and juries; ii) an EU prize for Women Innovators; iii) the use of a quota for admitting high quality proposals led by women to the interview (at least 25%); and iv) a women leadership programme run by the EIC business acceleration services.

[17] EIC Independent Expert Report (2020), Implementing the pro-active management of the EIC pathfinder for breakthrough technologies & innovations. Lessons from the ARPA model & other international practices.

[18] European Commission, DGRTD (2021); Deep Tech Europe. EIC Pilot Impact Report, 2020.

New bodies and organisational structures were established to govern the EIC Pilot and steer the transition towards the fully-fledged EIC. In particular, the following bodies were set up:

- The EIC Pilot Advisory Board brought together 22 innovators with different backgrounds (e.g., entrepreneurship, venture capital, science and technology) to advise the Commission on the implementation of the Pilot and the preparation of the EIC under Horizon Europe.

- In line with the SMEI, the Pilot was managed by the Executive Agency for Small and Medium Enterprises (EASME). In July 2019, the EIC Taskforce was created to coordinate the EIC Pilot implementation.

- The EIC Fund Board of Directors was established to make investment decisions based on recommendations of the EIC Fund Investment Committee and following the outcomes of due diligence conducted by the European Investment Bank as adviser of the EIC Fund.

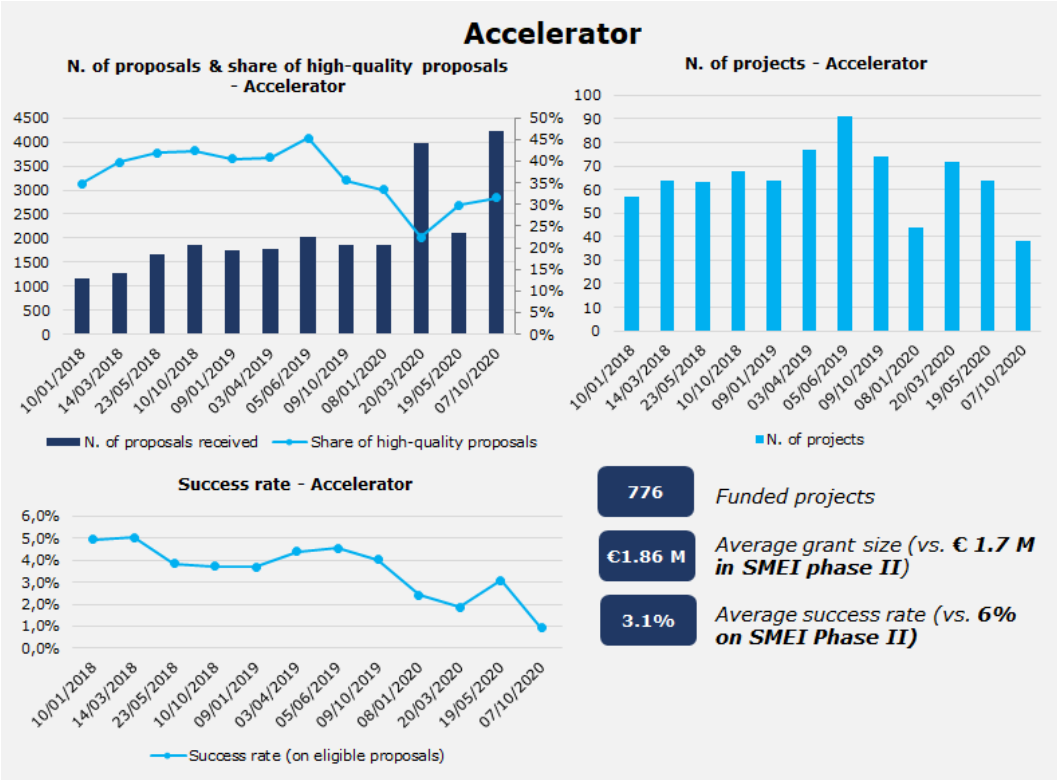
EIC Pilot implementation overview

This section provides an overview of the implementation of the EIC Pilot. It provides key facts and figures about how the programme has been delivered, leading to the analysis of EIC performance in the following chapter.

The number of proposals received by the Accelerator for each cut-off date increased over time, showing a progressive uptake of the programme, but the success rate decreased consequently. In the period covered by this evaluation, the success rate for the Accelerator never exceeded 5.5%, and it dropped to less than 1.5% in the last call of 2020. A similar trend was observed for the Pathfinder, albeit with higher variability in success rates, depending on the number of proposals received for each call and the budget available for the different types of actions.[19]

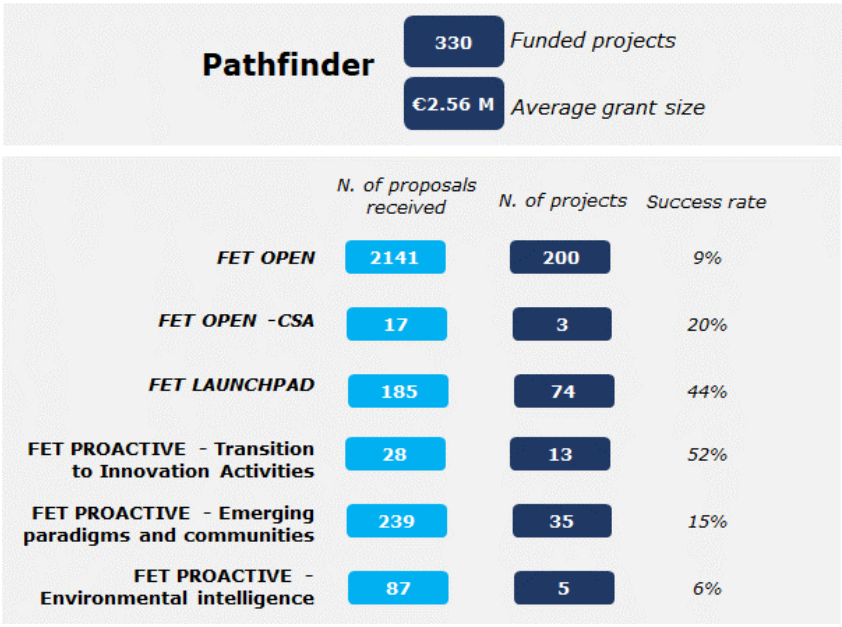
[19] For example, the call of the FET Open "Challenging Current Thinking" received applications at four cut-off dates (16/05/2018, 24/01/2019, 18/09/2019, 3/06/2020) and the number of applications increased each time, from 375 in 2018 to 900 in 2020. The success rate fell from 11% - 13% in 2018- 2019 to 7% in 2020.

Figure 5. Key figures on the EIC Pilot Accelerator participation



CSIL elaboration of eCorda data. Success rate calculated considering the eligible proposals.

Figure 6. Key figures on the EIC Pilot Pathfinder participation

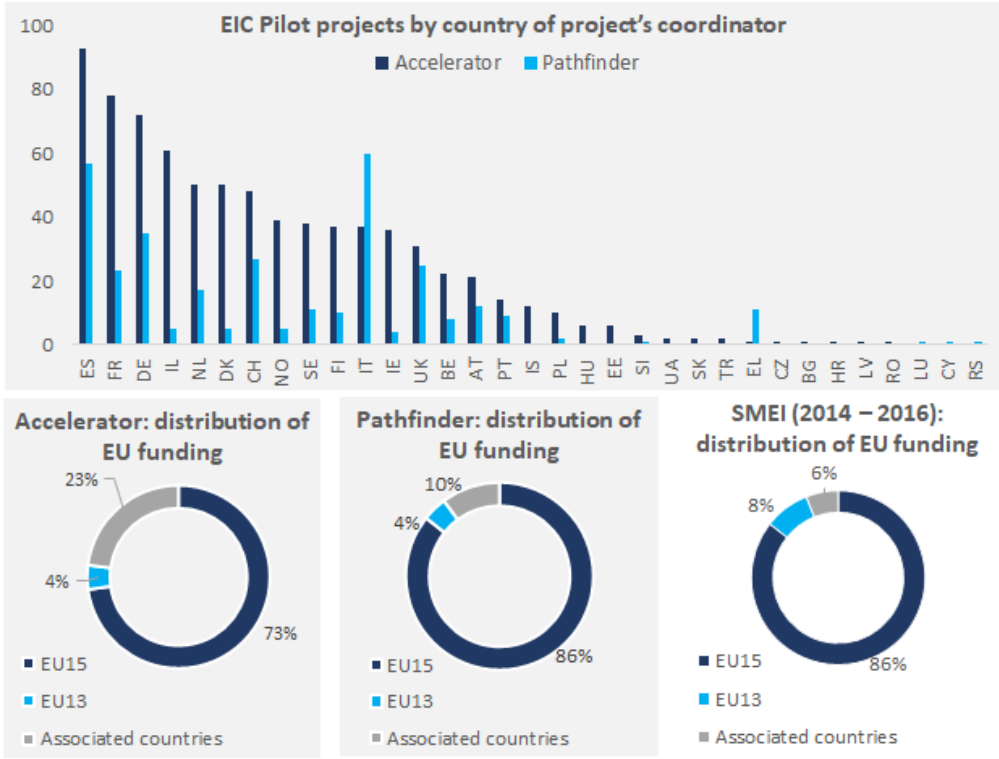


CSIL elaboration of eCorda data. Success rate calculated considering the eligible proposals.

Although applications came from more than 40 countries, the coordinators of funded projects were concentrated in a few EU-15[20] **countries and some associated countries.** However, compared to the SMEI, the Accelerator saw lower participation of EU-15 companies in project funding and much larger participation from associated countries, notably Norway, Switzerland and Israel. For companies based in EU-13, the EIC proved to be less accessible than the SMEI, which is probably due to the higher competitive nature of the Accelerator and its focus on disruptive as opposed to incremental innovation. Even when data are adjusted for GDP, the share of funding that goes to EU-13 countries remains modest. The four countries receiving the largest shares of Accelerator funding (relative to the size of their economies) are Finland, Denmark, Norway, Ireland, Sweden, while for the Pathfinder, it is Cyprus, Greece, Portugal, Switzerland and Austria that stand out as the largest (per capita) beneficiaries.

[20] UK included

Figure 7. The majority of projects were led by coordinators in a few EU-15 or Associated countries.

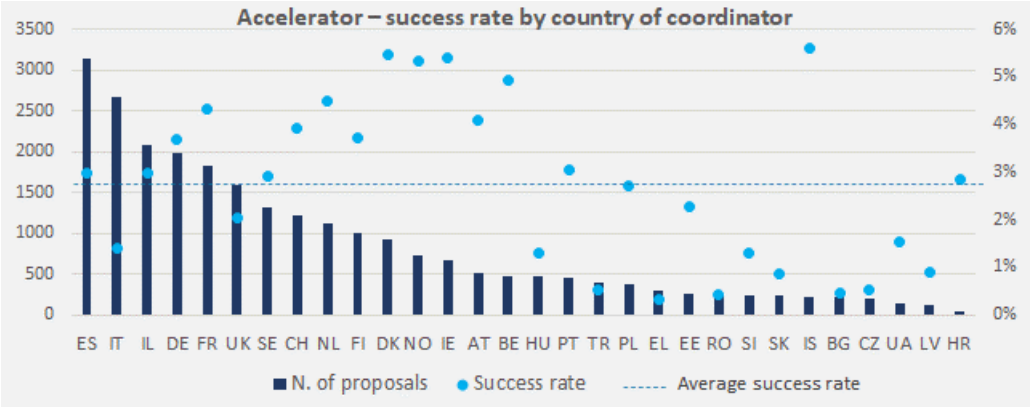


CSIL elaboration of eCorda data. Data on SMEI from European Commission, Evaluation of the SME instrument and the activities under Horizon 2020 Work Programme "Innovation in SMEs", Final Report, 2017.

Proposal success rates vary by country, but some countries are particularly successful. As in the SME Instrument 2014 – 2016[21], proposals from Central/Northern Europe are the most successful. For Pathfinder, the success rate is between 5% and 15% in most countries, with some outliers, notably Switzerland (with almost 28% of successful proposals) and the Netherlands (with almost 25% of successful proposals). Coordinators from Luxembourg and Cyprus led a small number of proposals but with a high success rate in the Pathfinder. Several factors underlie this geographical participation pattern. Entities located in countries with few alternatives (Italy and Spain) have a great incentive to apply. Proactive national contact points and national funding to support applicants (Denmark) have also played an essential role in sustaining participation and increasing success rates. Finally, the strength of local start-up ecosystems has been an important factor driving participation and is particularly relevant when looking at regional data.

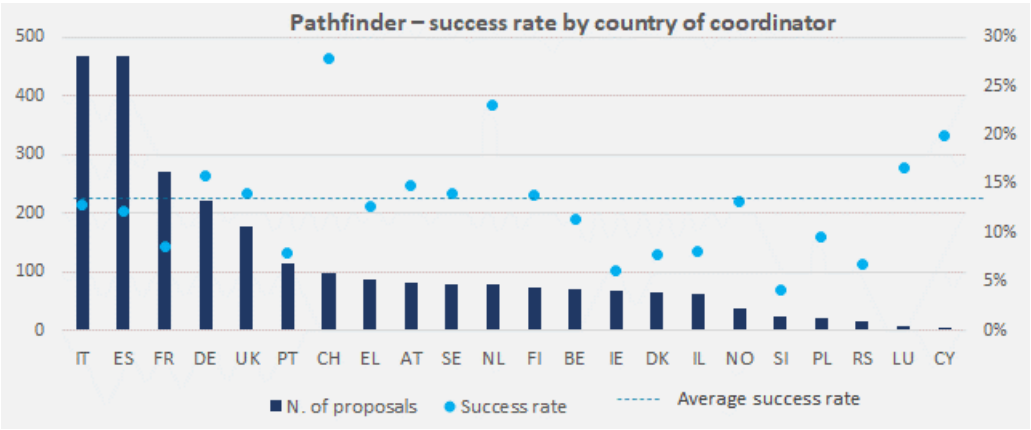
[21] Denmark, Ireland and Estonia were the most successful countries in the SMEI. European Commission, Evaluation of the SME instrument and the activities under Horizon 2020 Work Programme "Innovation in SMEs", Final Report, 2017.

Figure 8. For the Accelerator, only a few countries have a success rate above 5%.



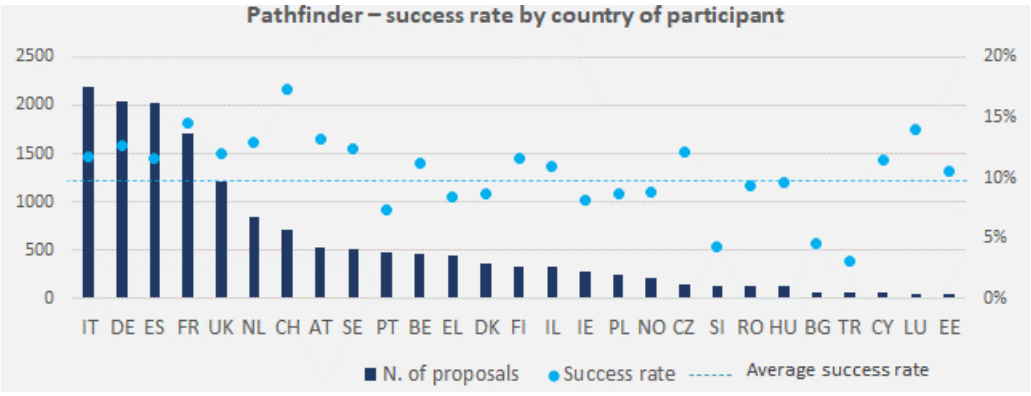
CSIL elaboration of eCorda data. Only countries with success rates>0 are included in the graph.

Figure 9. For the Pathfinder, Switzerland, the Netherlands and Cyprus stand out with high success rates.



CSIL elaboration of eCorda data. Only countries with success rates>0 are included in the graph.

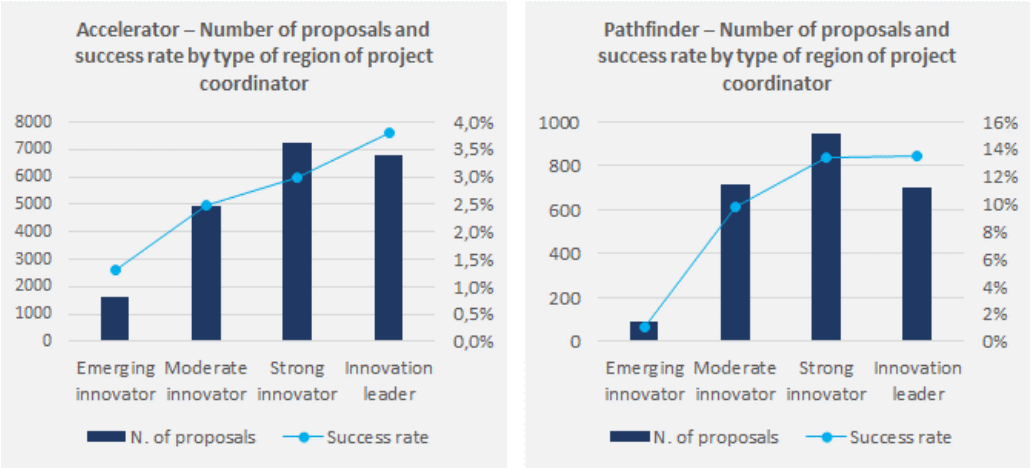
Figure 10. Considering all the applicants participating in the Pathfinder consortia, organisations from Switzerland, France, Luxembourg, Austria and Netherlands were the most successful.



CSIL elaboration of eCorda data. Only countries with success rates>0 and more than 50 proposals are included in the graph.

Organisations in highly innovative regions have been more successful when applying for the EIC Pilot. Whilst very few proposals are led by applicants from regions classified as "Emerging innovators", there is quite a good distribution among regions classified as "Moderate Innovators", "Strong Innovators", and "Innovation Leaders".[22] There is also a substantial difference in success rates between the two extremes of this classification. This regional funding concentration is a pattern that has also been observed by previous assessments of Horizon 2020 and FP7, leading to a debate on the role of these programmes in reinforcing existing territorial unbalances.

Figure 11. Proposals led by coordinators from innovative regions are more successful in the EIC Pilot.



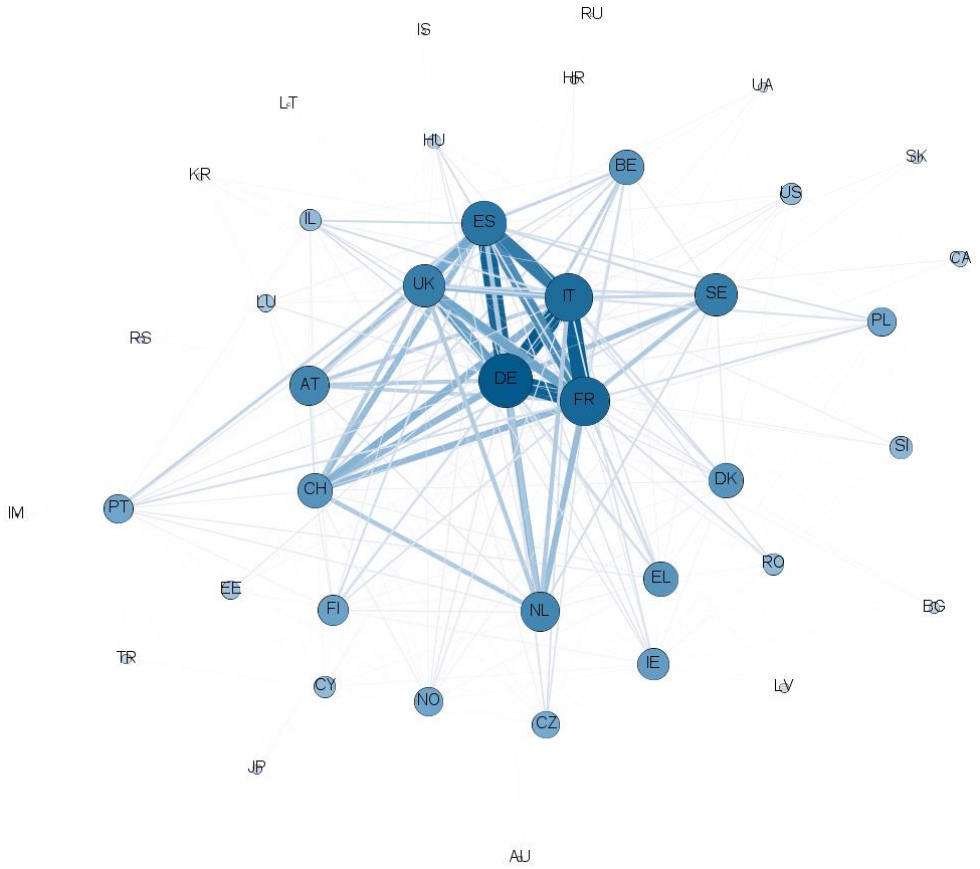
CSIL elaboration of eCorda data.

In the Pathfinder, the geographical distribution of consortia displays a high concentration in the few countries and regions that are at the centre of deep tech ecosystems. Organisations based in Germany, France, Italy, Spain and the UK have well-established collaboration networks (Figure 12). Each is connected through project collaborations with more than 30 countries and plays a key role within the collaboration network, acting as the main connector to the programme for more peripheral countries. Lithuania, Croatia, Latvia, Slovakia, and Bulgaria are the least connected countries among the EU27+UK Member States. This pattern was also found in previous assessments of H2020[23].

[22] See the Regional Innovation Scoreboard classification at: https://ec.europa.eu/growth/industry/policy/innovation/regional_en.

[23] The mid-term evaluation of H2020 found that they were centralised around "larger and older Member States such as the United Kingdom, Germany, Spain, Italy and France, with Third Countries and newer Member States in the periphery of the network". European Commission, Interim Evaluation of Horizon 2020, Annex I, SWD(2017) 221 final.

Figure 12. Geographical distribution of participants in Pathfinder consortia.



Note: the size of the bubble and the intensity of the colour is proportional to the degree of centrality (number of countries each node has connections with), while the thickness of the edges is proportional to the weight (number of projects involving the two countries. CSIL elaboration of eCorda data.

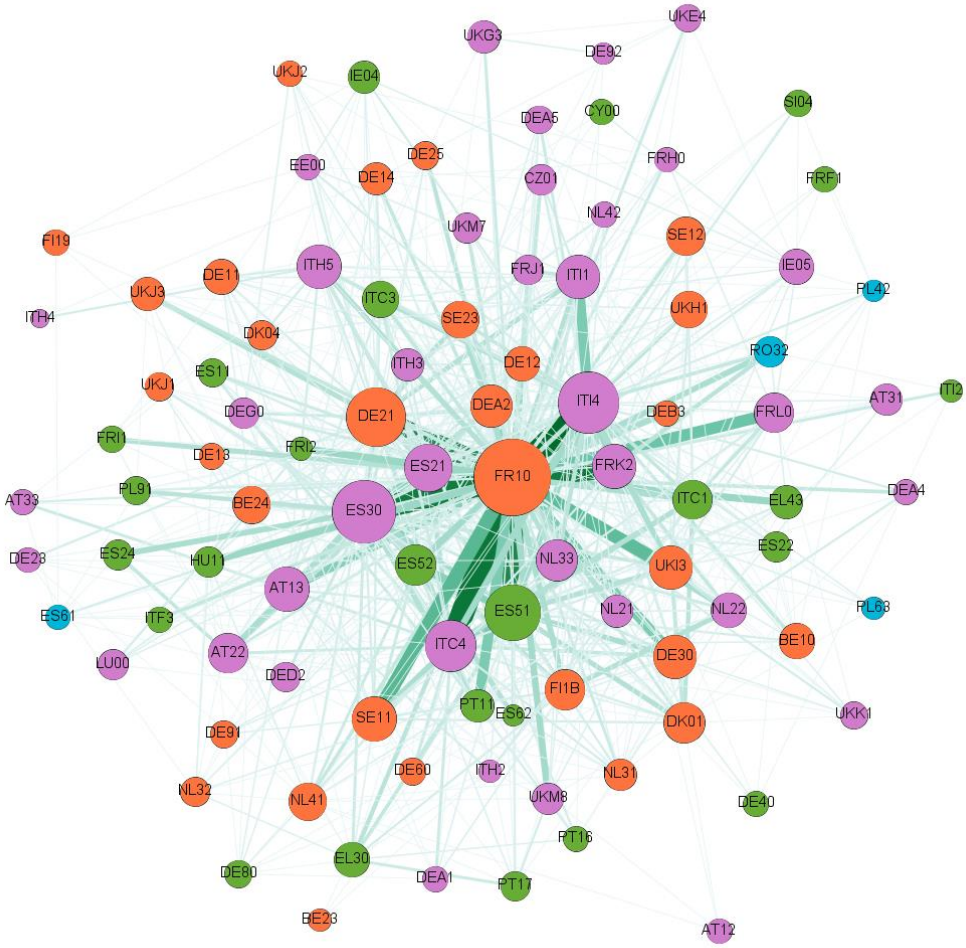
Concentration and technology-domain specialisation are even more marked at the regional level,[24] where collaborations are highly concentrated in a few regions that are highly innovative and dynamic. For example, the French region Ile-de-France (Figure 13, FR10) constitutes a hotspot for all digital technologies[25]. Although most projects are concentrated in highly innovative regions, there are also a few emerging innovation regions, such as Bucharest-Ilfov (RO32), where local organisations were able to be involved in collaborative projects with the most central regions. Green and Healthcare technologies are developed by regions throughout Europe, although some regions focus on specific technologies.

[24] See the methodological annex for an analysis of technology and geographical concentration for the EIC projects.

[25] In the Pathfinder, organisations located around Paris (including the CNRS) are involved in 106 projects and have established collaborations with organisations located in 79 different EU regions. In particular, solid collaborations have been strengthened with organisations based in Lazio (ITI4), Lombardy (ITC4), Madrid (ES30), and Rhône-Alpes (FRK2).

Overall, these participation patterns reflect regional specialisation,[26] which is itself a sign of well-established and vibrant R&I systems.

Figure 13. Pathfinder collaborations are concentrated in a few regions.



Note: the size of the bubble is proportional to the degree centrality (number of regions each node has connections with), the thickness of the edges is proportional to the weight (number of projects involving the two regions), while the colour partitions regions according to their innovativeness type. Only EU27 regions connected with at least five different regions through more than one project are shown. CSIL elaboration of eCorda data.

[26] Prognos, CSIL (2020), Study on prioritisation in Smart Specialisation Strategies in the EU Final Report

EIC PILOT PERFORMANCE

This chapter provides an independent assessment of the EIC Pilot's performance. It is structured along with the evaluation criteria of relevance, efficiency, effectiveness, coherence and EU value-added defined in the EU Better Regulation guidelines.

Relevance

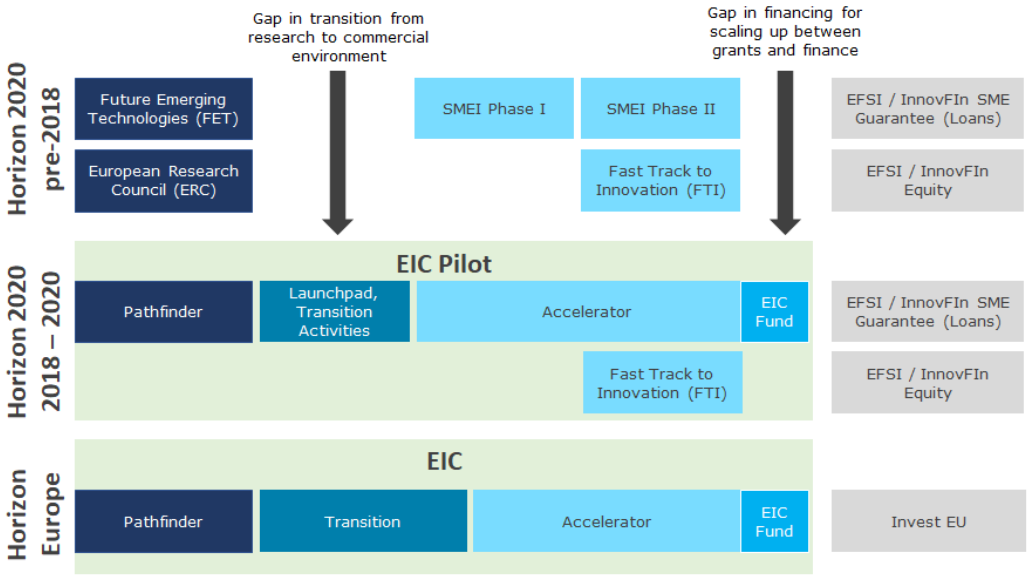
This section assesses the EIC Pilot's alignment with EU policy objectives and looks at the novelties introduced by the programme and the extent to which these are suitable for addressing societal and economic needs. In particular, this analysis focuses on the following changes: i) the integration of the SMEI and FET under a coherent programme; ii) the support for the transition of research discoveries to the market, iii) the use of a bottom-up approach in the EIC calls' design iv) the establishment of the EIC Fund.

Alignment with EU policy objectives and needs

The EIC Pilot has been the first EU programme simultaneously addressing the funding gaps known as the two "Valleys of Death" and connecting scientists with innovators to bring innovation to the market (Figure 14). In combination with other EU initiatives, and with its broad objectives encompassing technological breakthroughs and science-based innovation along with companies' scale up, the EIC is set to contribute to multiple EU policy objectives. The EIC Pilot's work programme met the main EU policy orientations on R&I and supported the EU Industrial strategy. The Pilot's work programme for 2018-2020 outlined a response to the objectives set by key EU policies, including the Capital Markets Union (CMU)[27], the New Industrial Policy[28], the European Green Deal and the Digital Transition and the European Research Area (ERA). In particular, the need to improve the translation of R&I results into the economy and the provision of finance to innovative start-ups and SMEs to support the competitiveness of the European economy established a strong rationale for the revision of the SMEI and FET instruments and the setting up of the EIC Fund.

[27] Action Plan on Building a Capital Markets Union COM/2015/0468 final
[28] Brussels, 27 May 2019 (OR. en) 9706/19 COMPET 433 IND 185 MI 476

Figure 14. The EIC Pilot addressed the two "Valleys of death"



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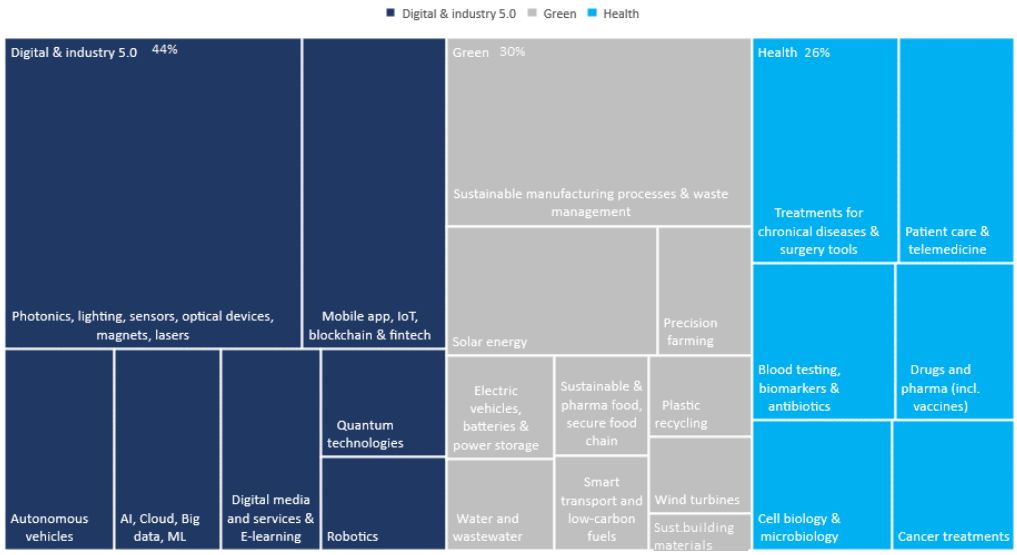
The EIC portfolio is geared towards contributing to the EU policy priority of a twin transition and addresses newly emerged public health concerns. The green and digital transitions have been on top of the EU political agenda since 2019[29]. In March 2020, the European Commission published a Communication on A New Industrial Strategy for Europe[30]. This strategy was part of a package of communications, including an SME strategy[31] for a sustainable and digital Europe aiming to considerably increase the number of SMEs engaging in the green and digital transition. In 2020 the coronavirus pandemic put healthcare at the centre of EU policy debate and action and spurred unprecedented initiatives to reinforce national healthcare systems and contain the spread of the virus. Funds from Horizon 2020, including the EIC, were directed at improving the European response capacity in a similar emergency context. Using text clustering techniques, projects were classified into 23 technology classes[32] that could be linked to one of these macro-areas with a balanced distribution among them: 44% of projects to the Digital & Industry 5.0 macro-area, 30% to the Green macro-area and 26% to the Health macro-area. The identified technology classes comprise key research themes for EU research and industrial policies, including AI, IoT, autonomous vehicles, batteries and

[29] Ursula von der Leyen (2019). The political guidelines for the next European Commission 2019-2024.
[30] A New Industrial Strategy for Europe. European Commission Brussels, 10.3.2020 COM(2020) 102.
[31] An SME Strategy for a sustainable and digital Europe. European Commission, Brussels, 10.3.2020 COM(2020) 103 final
[32] See the methodological Annex for more details on the text clustering.

power storage, quantum technologies, vaccines, and cancer treatments.[33] Portfolio alignment with the Green and Health macro-categories has been further reinforced with thematic calls.

Figure 15. Distribution of EIC Pilot projects among technology classes and the policy areas



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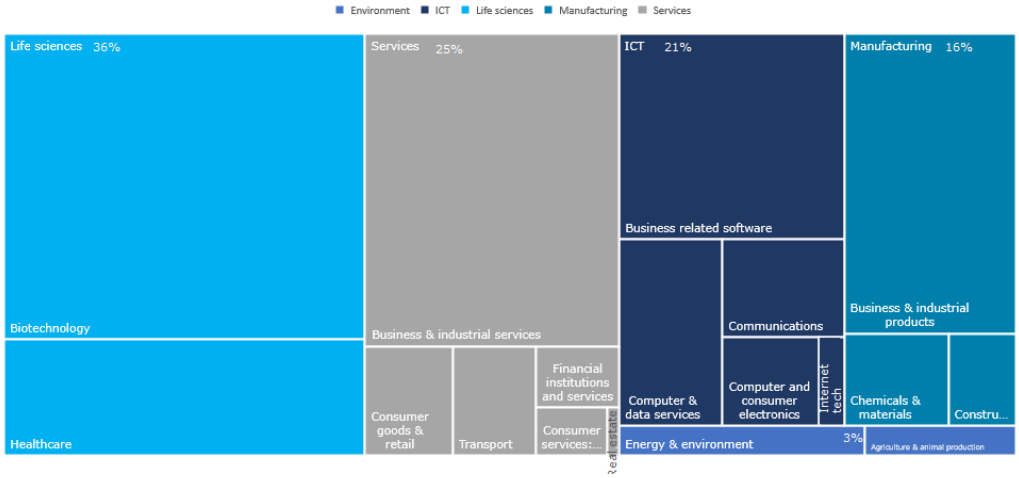
The sector distribution of Accelerator projects[34] **mirrors the classification by technology domains and confirms the programme's alignment with EU policy objectives and priorities** (Figure 16). Projects are distributed across five macro-sectors: Environment, ICT, Life Science, Manufacturing, and Services. Accelerator participants mainly belong to the Life Science macro sector and, more specifically, to the Biotechnology sector (about 26%), registering a significant increase from 23.1% in 2018 to 28.7% in 2020. This result correlates with the increased interest in health-related projects stemming from the COVID-19 pandemic.

[33] AI, IoT, quantum computing, connected and automated mobility are initiatives of the policy area "Shaping Europe's digital future". Energy storage is a key theme for energy R&I and the transition towards carbon neutrality. Cancer is one of the Horizon Europe Mission.

[34] Since Pathfinder participants are usually education institutions or research centres it is not possible to investigate the sector of application.

Figure 16. Sector classification of Accelerator projects' participants (NACE)

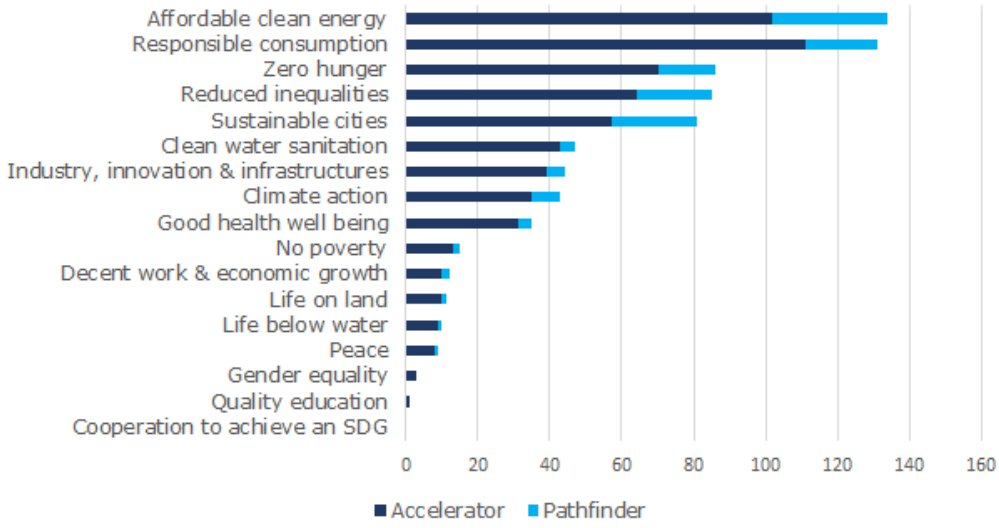


CSIL elaboration of Orbis and eCorda data

The alignment of the EIC project portfolio with the United Nations Sustainable Development Goals (SDGs) deserves to be further assessed. Contributing to the SDGs is a priority of the EU, reflecting the international commitment to eradicate poverty and achieve a sustainable world by 2030. The link between the projects funded by the EIC Pilot and the SDGs was not tracked by the programme's monitoring system. Through systematic project summary review[35], this evaluation was only able to assign 461 EIC projects (42%) to the SDGs with good coverage of the Green Deal relevant areas (Figure 1). These results do not imply that the other half of the portfolio includes projects that are irrelevant to the most pressing human challenges. Project summaries are probably not sufficiently elaborated to assess how projects could contribute to the SDGs, and there is a high probability that the result of such analysis may be biased by the use of SDG-specific buzzwords. When projects are analysed more in-depth, as in the case studies, it can be observed that projects are solution-oriented and motivated to identify feasible high-impact solutions. The focus on societal challenges also reportedly gave companies a societal purpose and is important for staff motivation[36].

[35] See the methodological note for more details about key words selection
[36] See case study project summaries in meta-analysis.

Figure 17. SDG7 "Affordable clean energy" and SDG12 "Responsible consumption" are those gathering the highest number of projects.



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The EIC Pilot's contribution to cross-cutting issues involving policy priorities promoted across Horizon 2020 has been mixed. The data[37] show a positive contribution to the objectives of increasing SME participation in R&I[38], digitalisation[39] and transition to the market[40]. Conversely, the programme lagged behind compared to targets reported in the Horizon 2020 mid-term evaluation for widening participation and international cooperation, with less than 7% of participants and EU funding to widening countries[41] and less than 1% of participants from Third Countries (considering only the Pathfinder).

The programme has adopted thematic calls[42] to finance projects with positive impacts on sustainable development and carbon neutrality. Since June 2020, any proposal concerning the energy efficiency of fossil fuels technologies, or the use of fossil fuels, were considered ineligible. These actions strengthened the programme's expected impact on the climate, sustainability, and biodiversity cross-cutting issues. However, the available data do not allow to conclude with certainty about the EIC Pilot's contribution to this horizontal topic. Horizon 2020

[37] More detailed data on KPIs and comparison with the mid-term evaluation of Horizon 2020 are presented in the methodological Annex.
[38] This is embedded in the elegibility criteria of the Accelerator, but it is important to mention thta the Pathfinder met the target of 20% of EU funding going to the SMEs.
[39] More than 50% of the EIC Pilot funding can be considered as related to ICT according to the markers assigned by the project officers.
[40] Embedded in project design and reinforced through specific instruments including the Pathfinder Launchpad and the call "Transition Activities".
[41] This is lower than in SMEI: 8.4% of the funding was for EU-13 countries in 2014 – 2016.
[42] The EIC Pilot work programme (Accelerator) launche a "Green Deal call" between March and May 2020 with a budget of around €300 M. The Pathfinder (FET Proactive) included two Green Deal calls in 2019 and 2020.

monitoring system reported that only 206 (less than 19%) projects contributed to at least one of these horizontal themes, but the actual number is probably higher and more in line with the targets. The technology classification that has been used in this evaluation has identified that at least 334 projects can be linked to technologies having a possible green impact.

Data on gender balance in participation is also inaccurate. From the data collected in the Horizon 2020 monitoring system, it is not possible to find the gender of the project leader. This evaluation has used external data sources, but data coverage could not be extrapolated to the whole portfolio[43]. Nevertheless, it is important to stress that the EIC Pilot has introduced specific measures supporting women-led companies that ensure that at least 25 per cent of applicants invited to the interview have a female CEO or an equivalent position (see also the section on effectiveness).

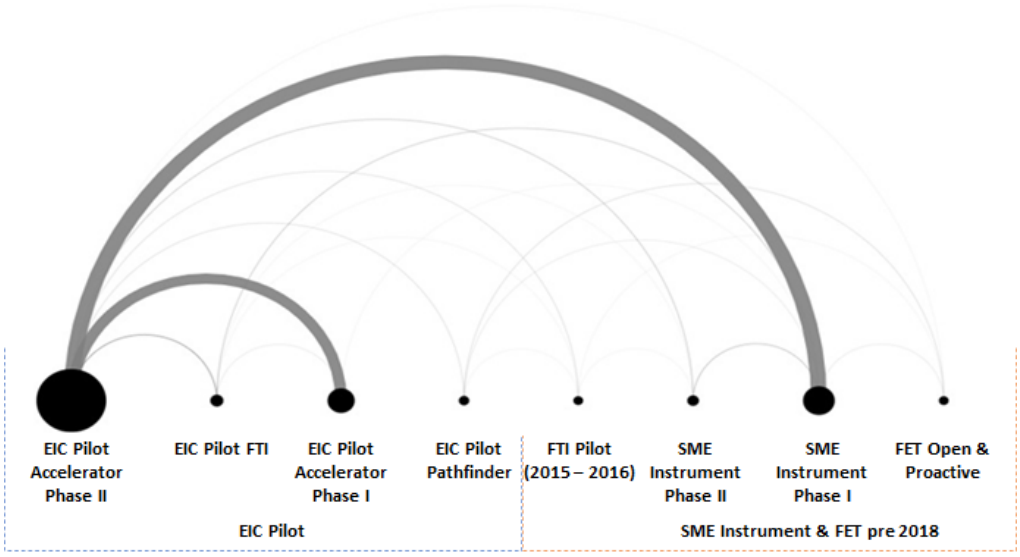
Fit for purpose of the novelties introduced by the EIC Pilot

The Pilot deployed a combination of instruments to support the integration of the FET and SMEI under the EIC umbrella, but this transition has not been yet completed. The Pathfinder and the Accelerator complement each other when covering different TRL levels. Several mechanisms have been embedded in the Pilot to facilitate the transition of early technology breakthroughs towards the market, namely: i) streamlining the past FET and SMEI within a coherent programme, ii) a portfolio approach in research project management implemented by the Programme Managers, iii) the FET Launchpad and transition calls, and iv) the possibility for Pathfinder participants to benefit from business advisory services. Some of these changes were introduced in 2019 and 2020, and their effects have not had the time to fully materialise.

From an analysis of the EIC Pilot project portfolio, it can be observed that the linkages between the programme's two components are yet to be established. The Accelerator proposals and projects often build on previous participation in the SMEI phase I or in the EIC Pilot phase I, whereas there is not yet sufficient evidence of technology upgrading or transfer from the Pathfinder to the Accelerator (Figures 18 and 19). Of the 915 participants in FET projects funded between 2014 and 2018, 56 (6%) applied for the Accelerator and 11 were successful. Many of these projects are running simultaneously (i.e., the same company receiving a Pathfinder and an Accelerator grant), and it remains to be seen what the result of this combined participation could be.

[43] Data in the EC monitoring system consider the gender of the contact person. According to ORBIS data, 53% of the 704 companies for which the information is available include at least a woman in the Board (although their exact role and involvment in the funded projects is unknown). According to the Innovation Radar data, 74 of the 102 Pathfinder projects monitored involved at least one legal entity in which the project leader is a woman. In 23 projects a woman is the project leader of the legal entity acting as coordinator, meaning that around 23% of the projects are led by a woman.

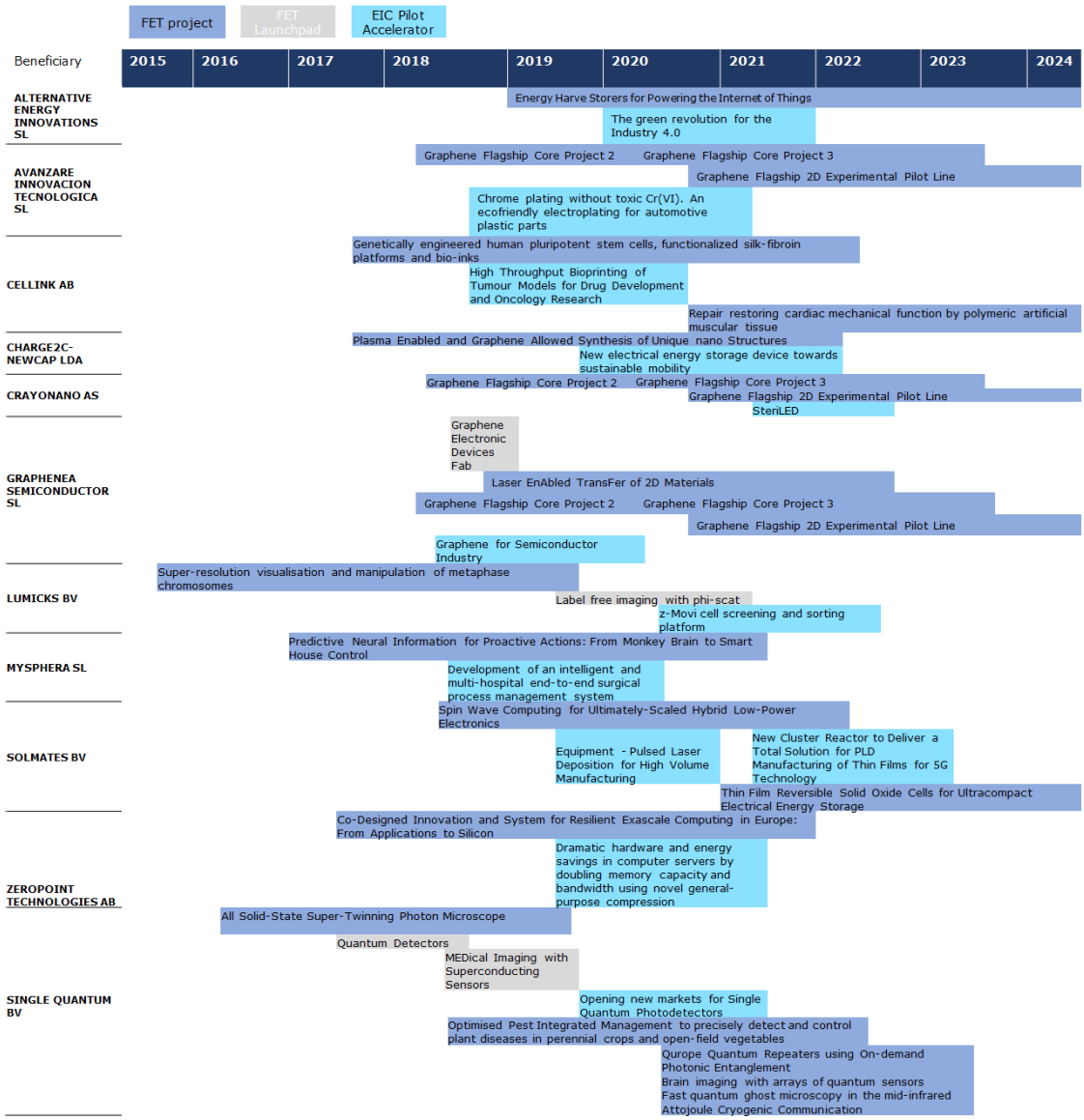
Figure 18. Almost half of the Accelerator participants have participated in SMEI I



CSIL elaboration of eCorda and Cordis data. Analysis of unique coordinators of the Accelerator (N=768).

A longer time horizon and a more complex analysis are needed to capture these linkages. A linear path from research to innovation cannot be taken for granted as multiple transition trajectories co-exist, implying that evidence on transition is incomplete when a short and medium-term timeframe is applied. Some technologies find immediate applications; others take decades before delivering visible applications. A single product/service may integrate technologies from different maturity levels, implying that transition paths are complex, nonlinear and often unpredictable. The commercial exploitation of results may also be undertaken by entities that were not in the original consortia, including by newly established spin-off companies. Finally, it is also important to stress that participation in the Pathfinder is driven by researchers and academics that may not be interested in spin-off and establishing entrepreneurial ventures.

Figure 19. Overview of FET and Accelerator projects involving the same beneficiary



The integration and consolidation of the SMEI and FET under a single programme continues in the new programming period through the use of specific instruments, including the EIC Transition to validate technologies and develop business plans for specific applications, the completion of the process of recruiting the programme managers, 'Booster' grants to ongoing EIC Pathfinder and EIC Transition projects, a Marketplace to connect preliminary and final research results with entrepreneurs and investors, and the Fast Track scheme for EIC

Pathfinder and EIC Transition successful projects to enter the EIC Accelerator[44]. In particular, the Transition programme should encourage other organisations, more inclined to commercialisation and entrepreneurship to reuse the Pathfinder projects' results.

The EIC Fund is underpinned by well-justified public policy goals and market needs, but stakeholders find it difficult to understand its rules. Providing financial support is crucial for supporting innovative enterprises. The blended finance option seems particularly relevant for deep tech start-ups, which need considerable resources to step up their research[45]. Recent data on VC investment patterns in deep tech ventures shows that the barriers to raising funds increase as VCs progressively shift away from their original vocation and seek investments with a more certain return, leading to a risk minimisation approach. Investors perceive deep tech as risky with both technology and market risks even if the barriers that have held back deep tech start-ups' development (cost of prototyping and testing, data access and computing power) are decreasing[46].

A contentious point on the Fund structure pivots around the interpretation of two eligibility rules: non-bankability and co-investment. The two criteria respond to the need to identify investment-worthy projects with traction from private investment, but that cannot be financed through traditional debt instruments. The first criterion addresses the lack of additionality observed in the SMEI and reflects the need to ensure that the Fund is not competing with the market by supporting projects that financial intermediaries could have financed. The second criterion ensures that market players do not see the recipient companies as publicly subsidised entities. It also guarantees that the European Commission remains a dormant investor in the company, till it may exit, due to the entrance of new investors. The two criteria are based on sound principles, but their interpretation may be difficult to grasp. Many have not properly understood the two criteria and consider it impossible to meet them together. This issue requires further communication through national contact points business and start-up associations.

The bottom-up approach pursued by the EIC Pilot is valued by stakeholders and has delivered a diversified project portfolio built upon deep tech emerging areas cutting across sectors and technology applications. The classification by technology domains captured both trending deep tech technologies, such as AI, quantum computing, photonics, blockchain, biotech, robotics and advanced materials, along with expanding application fields such as electric and autonomous vehicles, precision farming, telemedicine, e-learning, etc. The identified classes can be grouped in four macro-domains where the boundaries across them become increasingly blurred, opening new opportunities (Figure 20). For example, the class "Photonics, lighting, sensors, optical devices, magnets, lasers", gathering 45.5% of the Pathfinder portfolio, is

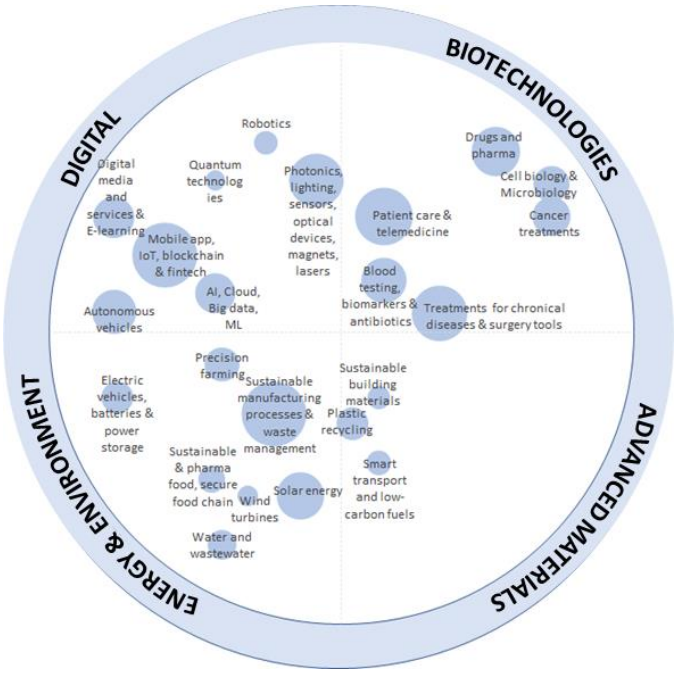
[44] EIC Work Programme 2022

[45] See WEF, KPMG (2020), *Bridging the Gap in European Scale-up Funding: The Green Imperative in an Unprecedented Time*.

[46] Boston Consulting Group (2020), The Deep Tech Investment Paradox: a call to redesign the investor model.

in between the Digital and Biotechnology clusters, since photonics is an enabling technology with multiple industrial applications. Likewise, projects in the "Treatments for chronic diseases & surgery tools" class make use of advanced materials (hydrogels) and apply them in areas such as bionics or regenerative medicine.

Figure 20. Classification of the EIC Pilot portfolio based on text clustering.



EIC portfolio data elaboration based on technology macro-classes as identified by the OECD Science, Innovation and Technology Outlook

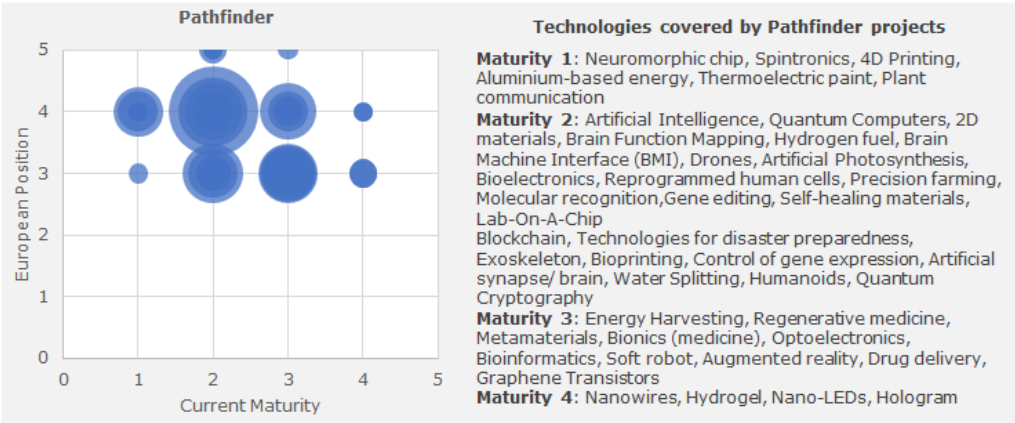
With its diversified portfolio across several technology domains, the EIC has supported technology fields that are underinvested by the market. According to recent data[47], despite rising investments in deep techs, the current investment model is heavily skewed in AI/ML and Life Science (approximately two-thirds of the overall investments), whereas SDGs, climate, and environmental concerns attract lower interest from private investors. In this respect, the text cluster analysis of the Accelerator's portfolio shows that 30% of projects relate to technologies that apply to energy and the environment.

The Pathfinder is well-positioned to foster future breakthrough innovations. Through a systematic review of the project summaries, we assessed that around half of the Pathfinder projects (166) could be linked to technologies likely to generate or contribute to "the 100 identified Radical

[47] Boston Consultring Group (2020), The Deep Tech Investment Paradox: a call to redesign the investor model.

Innovation Breakthroughs for the future".[48] Of these projects, 53 were funded by the Proactive calls, with research topics already defined in the call for proposals, and the remaining 113 came from open calls, indicating that both approaches are valid for supporting breakthrough innovations in promising technology areas. This analysis also found that the Pathfinder project portfolio includes projects in at least three "especially fast-moving technologies": neuromorphic chip (6), thermoelectric paint (1), and 4D printing (1). Projects also developed highly speculative technologies, especially in areas where Europe's position is stronger (e.g., plant communication, spintronics, bioelectronics, aluminium-ion batteries, airborne wind turbines, artificial photosynthesis).

Figure 21. Coverage of innovation breakthrough technologies by the Pathfinder



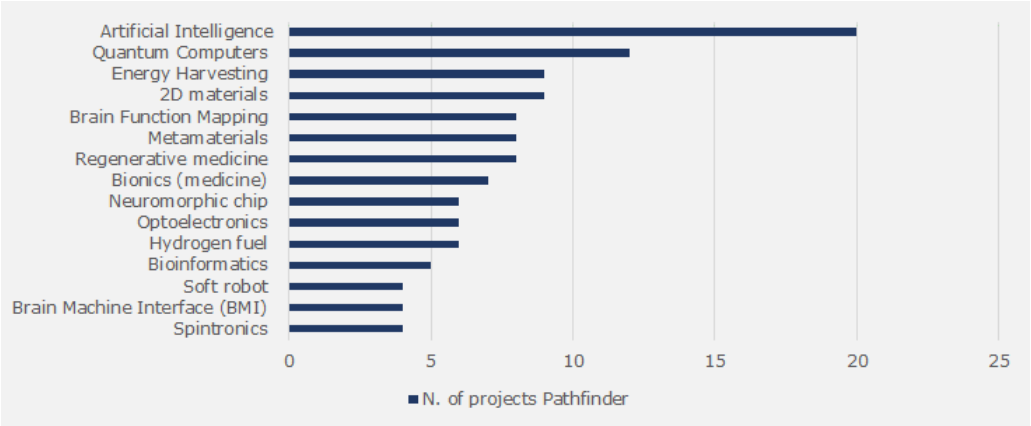
Maturity: This indicator describes the current status of the emerging technology. Low maturity (1) indicates first proof of concept or even first speculations, and very high maturity (5) suggests that a technology is already applied in first products.

European Position: This indicator captures the strength of Europe's current capability in research and innovation with regards to a technological innovation.

CSIL

[48] As identified by Philine Warnke, Kerstin Cuhls, Ulrich Schmoch, Lea Daniel, Liviu Andreescu, Bianca Dragomir, Radu Gheorghiu, Catalina Baboschi, Adrian Curaj, Marjukka Parkkinen, Osmo Kuusi (2019), "100 Radical Innovation Breakthroughs for the future", *The Radical Innovation Breakthrough Inquirer*, European Commission. More details about how this assessment was performed are included in the methodological annex.

Figure 22. Top 15 breakthrough technologies identified in the Pathfinder portfolio



CSIL

The Pilot had limitations in addressing emergency situations (COVID-19 crisis) that required the development and roll out of solutions in a very short period. In 2020, the EIC Pilot Accelerator put in place some dedicated and targeted actions to fund projects contributing to the Green Deal and help deal with the Covid outbreak (see box below). The two calls, especially the Covid call, attracted many applications and had a record low success rate. Stakeholders reported that this deluge of applications was driven by the uncertainty brought about by the pandemic and the fact that the following call would have been focused on green topics, restricting thus the possibility for financing for companies that could not prove the green impact of their projects. The quality of the project received was lower than in previous rounds, and selection was steered towards the health sector. Yet, it remains to be seen how these projects have contributed to addressing some of the problems created by the unfolding of the pandemics. Some of the interviewed stakeholders considered that the EIC project timeline, which generally lasts two years, is not fit for generating quick and immediately exploitable results.

Box 3. The EIC Pilot response to the Covid-19 emergency

In response to the Covid-19 emergency, the European Commission expanded the terms of an existing deadline – from March 18 2020 to March 20 2020, inviting all SMEs "with technologies and innovations that could help in treating, testing, monitoring or other aspects of the Coronavirus outbreak" to apply to the EIC Pilot. The number of applications in that cut-off reached 4,000 proposals. The share of proposals above the threshold was 22.4%, well below the average 35% of the other cut-off dates. The success rate stood at 1.9% with 72 selected projects. Proposals that provided solutions to mitigate the impact of COVID-19 benefited from a faster process to sign grants, and access to other funding was also facilitated.

The Green Deal related call was well perceived and received a large number of applications. Stakeholders generally think that the EIC could be an appropriate instrument for identifying technology applications contributing to fighting climate change and environmental degradation. Some stakeholders pointed out that the Green Deal related call for the Accelerator also delivered a certain amount of greenwashing in project proposals without substantial evidence of impacts.

Future evaluations will be needed to assess the extent to which projects with climate and environmental benefits were actually financed. The Better Regulation Tool #36 suggests a list of indicators that can be used at the project level to assess the environmental and climate impacts linked to the relevant SDGs.[49]

Efficiency

This section assesses the quality of the programme's delivery by looking at issues that emerged during the implementation of the Pilot. It discusses three phases of programme delivery: i) application and selection (programme attractiveness, drivers and barriers), ii) project management, and iii) communication and outreach activities. More recent changes in the programme's implementation procedures have been considered to reflect how the programme has learned and adapted after the Pilot.

Application and selection process

The EIC Accelerator has successfully attracted fast-moving, innovative companies. The Accelerator applicants and beneficiaries are more innovative than the average SMEs in Europe. Around 40% of unsuccessful applicants in 2018 (*N*=3,234) and 2019 (N=3,740) and 30% in 2020 (N= 3,740) and more than 60% of the beneficiaries (N= 776) had registered at least one patent[50]. On average, 9% of SMEs in Europe own registered intellectual property rights (IPR) like patents, trademarks or design rights, versus 40% of large companies.[51] Regarding the IP profile of companies applying and benefitting from the Accelerator, more than 65% of the Accelerator's unsuccessful applicants[52] and more than 70% of the beneficiaries[53] scored at least 50 out of 100 on the IP quality score in the year of application[54]. Furthermore, 29 companies (27 unsuccessful applicants and two beneficiaries) scored more than 75 out of 100, representing the most innovative companies in this group.

Following the OECD definition of high growth companies[55], the data shows that, in 2018, Accelerator applicants were on average high growth companies, characterised by an average annual growth rate of employees equal to 30%. Focusing on Accelerator participants in 2018, out of 103 companies with at least

[49] Better Regulation Toolbox, November 2021 version. https://ec.europa.eu/info/sites/default/files/br_toolbox-nov_2021_en_0.pdf

[50] ORBIS IP data. If there were no data for a company, this was interpreted as no patent.

[51] http://documents.epo.org/projects/babylon/eponet.nsf/0/981A954C6D692D4DC125849A0054C147/$File/Patent_commercialisation_scoreboard_European_SMEs_2019_en.pdf.

[52] Data available for 4673 companies.

[53] Data available for 472 companies.

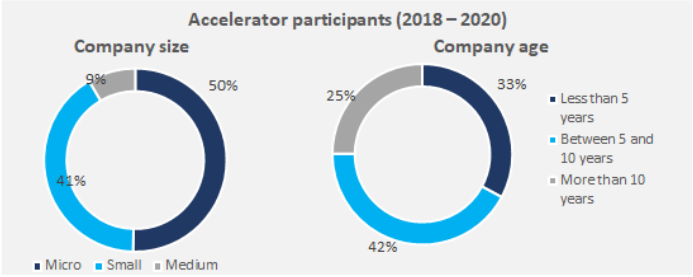
[54] The IP quality score is assigned by ORBIS IP from 0 to 100 based on the performance of the peer group of each company.

[55] All enterprises with average annualised growth greater than 20% per annum, over a three year period should be considered as high-growth enterprises. Growth can be measured by the number of employees or by turnover.

ten employees (and a full-time series between 2015 and 2018), 51 (about 50%) had an average annual growth rate between 2015 and 2018 above 20%.

In line with its objectives, the Accelerator increasingly attracted young micro-enterprises. From 2018 to 2020, the share of Accelerator beneficiaries that are microenterprises increased from 45% to 57%. The percentage of young enterprises (with less than five years) increased from 18% in 2018 to 49% in 2020. At the same time, the share of start-ups[56] participating in the programme increased from 24% in the SMEI phase II to 33% in the Accelerator.

Figure 23. Key features of the Accelerator participants

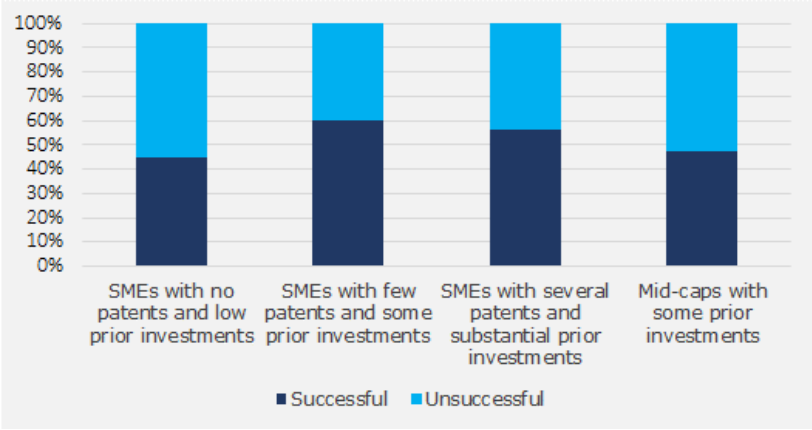


CSIL elaboration of eCorda and ORBIS data.

Through cluster analysis, four company typologies emerged to describe the EIC Pilot applicants and the companies selected tend to be the most innovative and dynamic. Applicants[57] were classified according to the number of employees, the company age, the number of patents, the total IP quality of the company, and the amount of private investment raised before the proposal submission. The clustering identified the following typologies of companies: i) Cluster 1 - SMEs with no patents held and low prior investments (N=500; 40. 13%), ii) Cluster 2 - SMEs with few patents and some prior investments (N=500; 40. 13%), ii) Cluster 2 - SMEs with few patents and some prior investments (N=313; 25.12%); iii) Cluster 3 - SMEs with several patents and substantial prior investments (N=412; 33.07%), and iv) Midcaps with some prior investments (N=21; 1.69%). Although the difference between selected and unselected companies remains limited by design (the comparison only includes teams that were invited for the interview), SMEs that had already registered some patents and had received investments rounds before applying to the EIC were more likely to be successful (Figure 24). Investments included private and other public funding, such as from Eurostars, the EIT, or national agencies.

[56] Established less than 3 years before the submission of the proposal.
[57] Includes successful and unsuccessful applicants invited for the interview. More details about the methodology are included in the Technical Annex.

Figure 24. SMEs that hold patents and had prior investments (including other public funding) are more successful



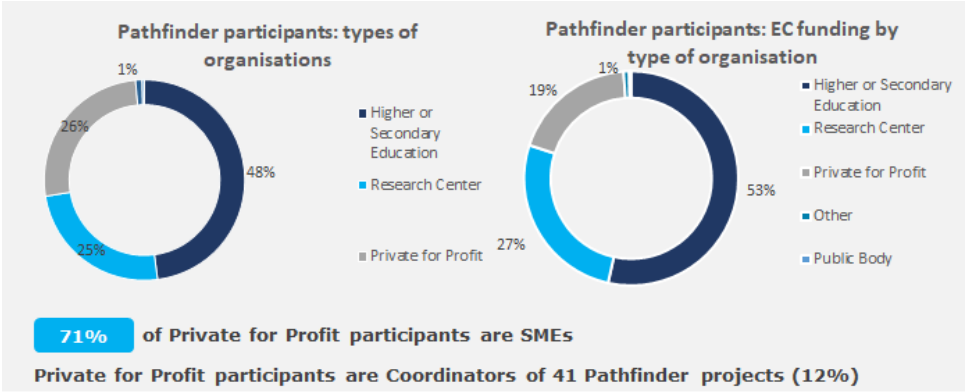
Source: CSIL elaboration on ORBIS, ORBIS IP and Corda data

Pathfinder participants mainly were from universities and research centres, and participation of companies remained limited. Consortia are often composed of a mix of public and private bodies. In most cases, they include at least one higher and secondary education, one enterprise, and one research centre. An important characteristic of Pathfinder participants is that the same entity was often the beneficiary of multiple EIC grants. For example, the CNRS participates in 58 projects (18% of all Pathfinder projects), the CNR in 37 (11%), the Agencia Estatal Consejo Superior De Investigaciones Cientificas in 23 (7%), the Eidgenoessische Technische Hochschule Zuerich in 22 (7%), the Ecole Polytechnique Federale de Lausanne in 18 (5%). These national research organisations are composed of decentralised research units at different universities implying that different teams are likely to be involved in the Pathfinder projects. However, this pattern also indicates that some organisations have acquired the skills to compete successfully (established network of researchers, proposal writing capacity, administrative capacity), while entry barriers are higher for newcomers.

Private companies can play a key role in Pathfinder projects since they can rapidly test the technical and commercial feasibility of scientific discoveries. In the Pathfinder, they accounted for 26% of participants receiving 19% of the budget, and around 70% of them were SMEs. Between 2018 and 2020, there has also been a minor increase in SME participation (3%)[58]. According to interviews, the Pathfinder has remained academic-driven, but it has had the merit of drawing scientists' attention to possible technology breakthrough applications. For the time being, the programme has been mainly attractive and accessible for companies connected to universities and research centres. In these cases, SMEs are seldom in the driver's seat, with their participation sought to accelerate technology applications or as a service supplier.

[58] All data from eCorda

Figure 25. Key features of the Pathfinder participants



CSIL elaboration of eCorda and ORBIS data.

The EIC project portfolio includes newcomers, although previous exposure to Horizon 2020 facilitated application and selection. Most Pathfinder participants (84%) have been involved in other projects funded by H2020, and according to the case studies, previous exposure to the FP increases the chance of success. The Accelerator targeted groups that were previously less attracted by the programme, including start-ups, which explains the relatively higher number of newcomers in the programme (43%). Nevertheless, it has to be recognised that the SMEI was the actual pioneer in attracting newcomer SMEs to Horizon 2020 with a 76% of new participants. From the case studies, it also appears that participation in Phase I of the SMEI worked as a gateway to the subsequent Phase II/EIC Accelerator (Figure 18). Moreover, Accelerator beneficiaries have a track record of seeking and securing support for R&I from other sources both at the EU level (notably the Eurostars SME Programme and the EIT) and at the national level.[59] Whereas they do not duplicate the EIC as they differ in scale and level of ambition, the prior access to these schemes may have been beneficial to reinforcing the ecosystem in which the company operates and in creating the conditions for a successful application.

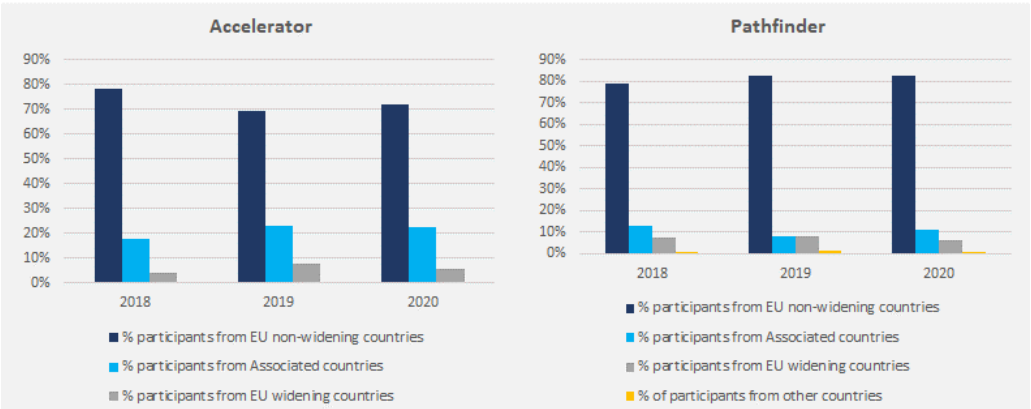
Less developed innovation systems in widening countries were not able to generate a critical mass of applications for the Pilot. The share of proposals from EU widening countries remained constant, around 10% for both instruments in 2018 – 2020. Only 7 out of 159 (4%) companies proposed to receive equity are from EU widening countries. The quality of the proposals from EU widening countries is, on average, lower. In the Accelerator, the share of proposals above the threshold for proposals coming from EU widening countries is 23%, compared to 36% for EU non-widening countries. The Pathfinder's share of proposals above the threshold is 29% for proposals led by an organisation established in EU widening countries and 48% for proposals led by an organisation in EU non-widening countries. The participation from EU widening

[59] For example, based on Dealroom data on other public investments received before the EIC grants, beneficiaries had received funds from the Swiss Venture Kick, Iceland's Technology Development Fund, Innovate UK, BPIFrance, Business Finland.

countries is particularly low in Launchpad calls, where the share of applicants from EU widening countries is between 2% and 4% of all applicants.

Unlike traditional start-ups, deep tech companies require complex innovation and entrepreneurial ecosystems[60] to thrive. These ecosystems are based on multiple types of players, including actors in the knowledge triangle (education, research and innovation) as well as financers (venture capitalists, public programmes). As an example, the literature identified several challenges for the development of more mature innovation ecosystems in eastern Europe, including insufficient use of public-private collaboration in R&D, lower funding for R&D and low availability of private equity, excessive reliance on EU funding (structural funds) which offer more accessible opportunities where competition is lower, the effects of the brain drain, and the inadequate regulatory frameworks[61]. With specific reference to getting access to the FP funds and the EIC, interviewees in EU widening countries pointed to less-developed support systems for the preparation of applications.

Figure 26. Distribution of applicants among EU widening countries, EU non-widening countries, Associated countries and other



CSIL elaboration of eCorda data.

For the Accelerator, the size of funding is the main driver of applications[62]. People interviewed for this evaluation also confirmed that companies are looking for big tickets to support the development of their projects into commercialisation. Other programme features that make it attractive for

[60] A common definition of an innovation ecosystem in the literature would include the complex interplay between different actors and institutions, including complementary, collaborative and competitive relations (Granstrand O., Holgersson M., 2020. Innovation ecosystems: A conceptual review and a new definition. Technovation, Volumes 90–91). Entrepreneurial ecosystem includes the presence of a strong group of leading entrepreneurs and universities, the availability of intermediary organisations (e.g. cluster organisations, university incubators) services and capital, the presence of large anchor firms, supportive public policies and communities of start-ups and entrepreneurs (Stam, E., Spigel, B. 2016. Entrepreneurial Ecosystems. Utrecht School of Economics. Tjalling C. Koopmans Research Institute. Discussion Paper Series 16-13).

[61] The Economist Intelligence Unit (2018). Creating innovation ecosystems in Eastern Europe

[62] Based on survey results

companies are the possibility to apply as individual entities, compared to other innovation support schemes where consortia are required, the open calls, and the programme reputation.

For the Pathfinder, open funding is the most attractive trait of the EIC, followed closely by the size of funding[63]. Pathfinder participants particularly appreciate the small size of the consortia, which streamlines proposal preparation and project management. However, according to the views of the people interviewed for this evaluation, the Pathfinder is less attractive than other Horizon 2020 instruments for researchers in academia. The reason for this lies in the lower success rate at the beginning of the EIC Pilot the specific structure of the Pathfinder with the three gatekeepers (radical vision, science to technology breakthrough and ambitious interdisciplinary research), which departs from the rest of H2020 programme. Most research ideas would fit better in other parts of Horizon 2020, possibly in the mainstream programmes than in the Pathfinder programme.

The outcomes of the evaluation process were often unpredictable, especially for the Accelerator. In interviews, participants reported a sense of randomness in project selection. Some beneficiaries reported that it was possible to succeed with a resubmitted proposal including minimal or no changes at all[64]. This fact has somehow undermined the credibility of the evaluation process and created a sense of haphazardness in project selection where the "luck factor" determined the difference between a selected and a non-selected high-quality proposal. Feedback provided by the evaluators was not considered sufficient to improve rejected proposals. At the same time, case study feedback on the jury panel was mixed. Whereas in some instances, the selected teams were impressed by the competence of the jury members, in other cases, they were left disappointed by the insufficient understanding of the more technical aspects.

The problems reported with the evaluation process were due to many factors, such as the budget available for each call, the large number of applications received and the broad range of technologies and sectors that needed to be covered by the evaluators. Identifying suitable evaluators may be a challenge in some cases. For projects with low TRLs in open subject calls, it can be difficult to assign evaluators to new, exploratory, interdisciplinary, not yet established research fields. Projects with higher TRLs may have had technologies that apply across several sectors. Moreover, the introduction of the non-bankability criteria was new to the SMEI, and initially, evaluators did not have a common understanding of how to apply it.

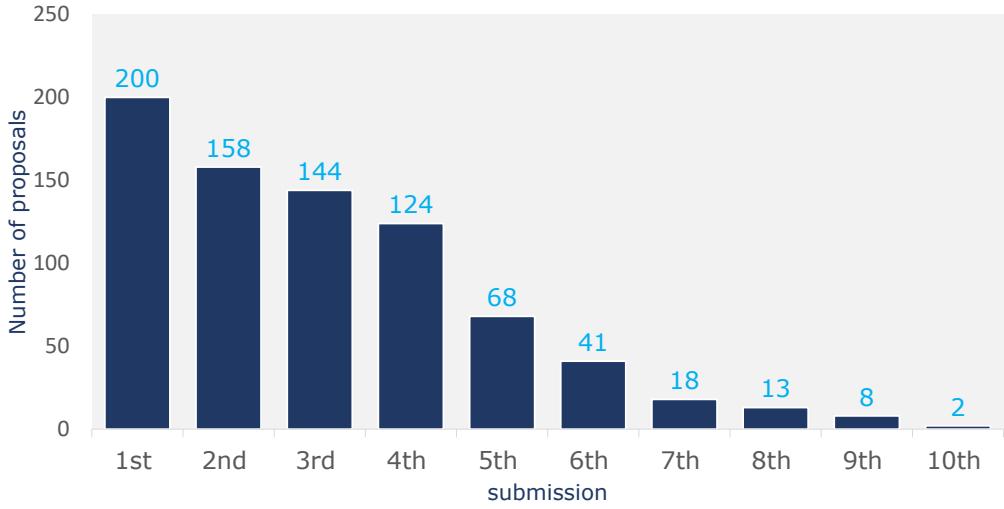
Low success rates were not commensurate with the efforts required by the application process. Oversubscription was driven by the programme's success and popularity, but also by a large number of re-submissions, with more than one out of 10 applicants applying more than five times between 2018 and

[63] As above

[64] In the case studies, 9 of the 15 projects analysed required 3 to 5 attempts before being funded. Similar feedback was also collected through the survey and the interview programme.

2020. Two-thirds of the Accelerator participants were successful at their first, second or third submission (Figure 27).

Figure 27. Distribution of Accelerator participants by the number of proposals submitted before being successful.



CSIL elaboration of eCorda data

Oversubscription is a problem that the EIC inherited from the SMEI, and that worsened over time as awareness about the scheme increased. The problem was exacerbated by the submission and re-submission of many unsuitable proposals[65] and has become an important factor holding back applications from companies and researchers that became increasingly frustrated. While the administrative part is considered agile and less burdensome than other national and regional schemes, writing a project proposal for the EIC is too resource-intensive and difficult to justify when the chances of getting a grant are so low.

The fully-fledged EIC has significantly improved the EIC application process. According to the Association of European consultants (EAIC), the new application system saves considerable time and effort for both the implementing agency and the applicants. Moreover, the new system is likely to favour the best applicants by reducing the "noise" of unsuitable applications that also contributed to reducing the programme attractiveness by keeping unnecessarily low success rates.

Companies have been recruiting specialised consultants to navigate through the application process, but this strategy was not sufficient to ensure success. More than 70% of survey respondents stated that they hired a consultant to prepare an application for the EIC. This figure is much lower for the Pathfinder applicants (less than 20%) who already have the skills to write a good

[65] On average 65% of the proposals received by the EIC Accelerator did not pass the quality threshold.

application because of their background in research. Companies from associated countries are more likely to seek consultant support but geographical differences, including between widening and non-widening countries, are minimal. Consultants can be hired both to help prepare an application and an interview. The costs vary greatly and generally include a fixed fee to be paid upfront and a success fee of up to 10%. Preparing a high-quality proposal requires skills that companies do not have in-house and includes knowing how to measure and value impacts. Consultants also help address the linguistic barriers of preparing the proposal in English. These are issues that have emerged already in the SMEI[66] and cannot be easily addressed unless the application form is substantially revised and simplified.

A new application process for the Accelerator in the fully-fledged EIC

The application process has been structured in two phases: a pre-screening stage (short application), a regular written stage (full application) and an interview stage. The scoring scale has been replaced by a simple "go / no go" approach. Only two submissions are allowed at each stage before a 24-month cooling off period.

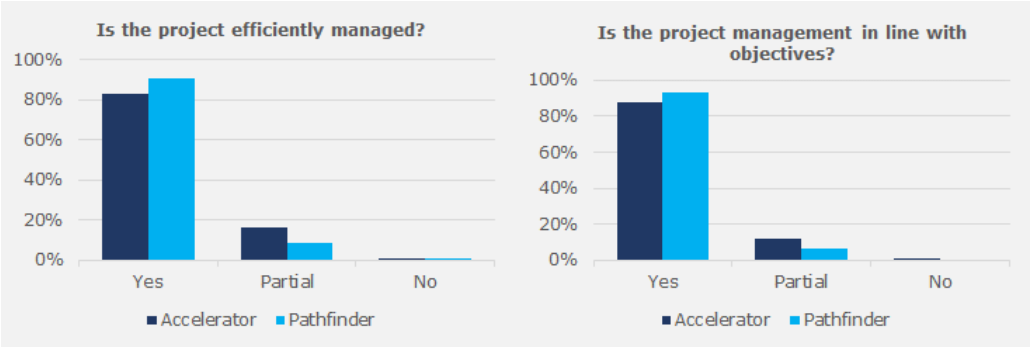
Nevertheless, results from the survey show that even if there has often been some consultant work behind well-written proposals, this was not sufficient to secure a project award. The quality threshold for the Accelerator's applicants to be invited to the interview was set at 13 out of 15 points. However, the number of candidates invited depended on the budget available for the cut-off date. Because of that, even proposals with a high score (e.g., 13.7 out of 15) did not pass the following step of selection. In addition, as separate ranking lists were defined at each cut-off date, proposals with the same score may have had opposite outcomes at different cut-off dates. Finally, success in the interview requires personal skills (e.g., English fluency, presentation and communication skills) that are difficult to acquire in a short time.

Management and implementation

Overall, stakeholders appreciate the agility and flexibility of EASME and acknowledge that the implementation of the EIC Pilot was challenging, especially after the Covid outbreak. Over 2020, Covid created critical challenges in programme and project implementation. For the executive agency (EASME), it has created a record-level number of applications and increased pressure on staff. At the project level, it has caused several delays affecting staff availability, supply chains, the possibility to travel, use labs and test facilities. Despite these difficulties, project management went smoothly (see Figure below). Beneficiaries were satisfied with the support received by project officers when dealing with grant agreement signature and reporting but also found the high level of staff turnover unsettling.

[66] CSES, CSIL, Prognos, KMFU (2021), Study on the effectiveness of public innovation support for SMEs in Europe, European Commission.

Figure 28. Assessment of the projects' management



CSIL elaboration of eCorda data.

Grant funding flowed well, but, at the early stage of the EIC Fund, companies had to deal with considerable delays and uncertainty. Beneficiaries appreciated the fast time-to grant of the EIC compared to other similar support instruments, but companies that were offered the blended finance option had to deal with considerable delays that went up to 12 months for the first batch of companies. The EIC Fund was incorporated on 22 June 2020 and operations effectively started on 1 September 2020. By that time, 140 companies had already been selected for investment support since the first call was launched in October 2019. Due diligence only started in August 2020. During this process, some companies were surprised when they were eventually offered a convertible loan instead of a full equity investment. Others were taken aback when they understood the implication of the co-investment requirement and realised they had to look for an additional investor by themselves. The length of the decision process and the delays in defining terms and conditions for the financing agreement were problematic for some of the selected companies. Some problems were fixed along the way, through better communication and reduced time-to-finance decision[67], but others have emerged in the new programming period 2021-2027 because of the transition from Horizon 2020 to Horizon Europe and continue to undermine the Fund's reputation and frustrate the awarded companies[68].

The role of the programme managers has not taken off during the pilot period. Following the DARPA model (See box), the EIC Pilot initially envisaged the recruitment of four programme managers, but these positions were not entirely fulfilled by the end of 2020. Beneficiaries interviewed for this evaluation were not clear about the difference between a project officer and a programme manager, but they look favourably at a more proactive and substantial involvement of project officers since the relationship with the executive agency has thus far been limited to administrative and reporting issues. The programme manager role has been through a longer than expected experimental phase. More

[67] The length of the time to finance decision was already halved for companies selected in the cut-off date of July 2020 and it went from 12.1 months to 5.9 months.

[68] Delays at the beginning of the new programming period were due to the fact that the arrangements for implementing the EIC Fund needed to be re-established under Horizon Europe regulations.

time is needed to observe the results of this strategic choice, especially in developing project pipelines into coherent portfolio strategies. It also remains to be seen if the resources dedicated to the programme managers are sufficient to fulfil their mission.

Box 4. DARPA model highlights

- → Besides the focus on defence, there are some important differences between the EIC and DARPA. The mission-driven approach, which is considered one of the drivers of DARPA's success, is only implemented in some parts of the EIC work programme. Compared to other public programmes in the US, DARPA benefits from special procurement rules that give to the agency a lot of flexibility and facilitate a risk-taking attitude[69].
- → In terms of human resources, DARPA has approximately one hundred program managers, which are coordinated by the office directors, deputy office directors, agency directors and deputy directors who supervise them. They are generally government employees recruited temporarily. In addition, to assist the program managers, DARPA also contracts out talented PhD scientists and engineers. This large resource endowment allows DARPA's staff to steer projects.

Communication and outreach

The EIC Pilot had great visibility. Survey results show that consultants have proactively promoted the Accelerator and greatly contributed to raising awareness about the EIC's opportunities. By contrast, Pathfinder applicants mainly heard about the programme by word-of-mouth from other research organisations, which is consistent with the network-based participation pattern. However, substantial differences still exist across the Member States, with some being more active than others in promoting the programme, including providing support for participating. Nevertheless, increased programme awareness is insufficient to stimulate higher participation in widening countries, especially in less developed and innovative regions.

In the early stage of the EIC Fund, communication problems have created expectations that could not be met. The European Commission had no experience in directly managing such a fund and could not properly anticipate and mitigate the related risks. Important aspects were not defined when the Fund was launched (e.g., procedures for selecting people for a seat on the Board of the investee companies), and the risk that the Fund rules would not have been properly interpreted was not anticipated. This applied in particular to the co-investment rule, for which it was not clear to what extent the EC would have supported the selected companies in finding a co-investor. Applicants to the Accelerator had problems fully understanding the implications of transitioning from grant and subsidy-based funding to equity funding. The implications and consequences of applying for a grant or an equity investment, or both, are very different and involve technical and financial due diligence and the use of different financial products.

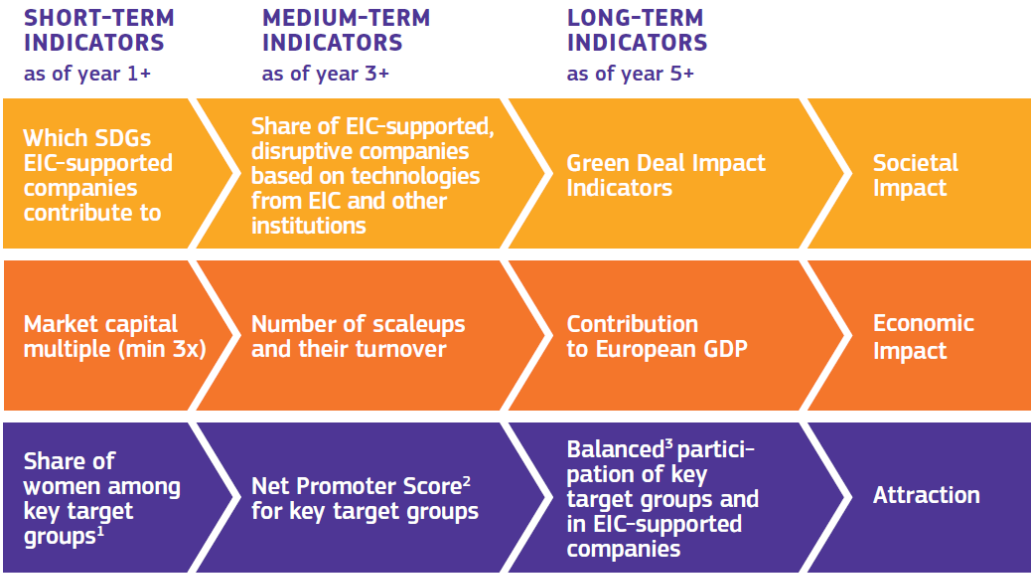
[69] Terzi A. Singh A., Sherwood M., (2022) Industrial Policy for the 21st Century: Lessons from the Past. Box 2.

Continuous changes have been surprising for stakeholders, but the understanding of the EIC programme and Fund objectives and targets has improved during the pilot. Initially, the focus on deep tech (as compared to digitally-driven) and disruptive (as compared to incremental) innovation was not well understood, leading to many unsuitable applications. The SMEI was already a new instrument in Horizon 2020, and the transition to a different programme configuration took many unprepared. Nowadays, stakeholders have a better understanding of the programme, but some reported a sense of fatigue towards continuous changes and hope for greater stability.

Effectiveness

In May 2020, the EIC Pilot Advisory Board published a "Vision statement" outlining the EIC impact pathways, with a focus on key performance indicators of societal impact, economic impact, and attractiveness (Figure 29). This section presents some preliminary findings based on the evidence collected on the progress towards the programme's objectives and its (short-term) KPIs.

Figure 29. The EIC Pilot assessment framework



[1] Key target groups include entrepreneurs, researchers and investors
[2] As outlined by Reichheld, F. (2003), The One Number You Need to Grow, Harvard Business Review, December
[3] Balanced across various categories (gender, states, regions, etc)

EIC Advisory Board (2020), A Vision and Roadmap for Impact.

An analysis of the Pilot's preliminary scientific and technology impacts is also included to account for the early progress of the Pathfinder's projects. This section also discusses the main factors that contributed to the project's achievements alongside some methodological challenges and limitations.

Societal impacts

The first indicator to measure the societal impact of the EIC looks at how EIC-supported entities have contributed to the SDGs against an objective of over 90% of the EIC portfolio built on a portfolio of impact-oriented companies. Considering the status of implementation of most projects, this analysis was performed by looking at the projects' descriptions and objectives as reported in the projects' summaries. Within this evaluation, attractiveness was considered a societal objective and is therefore discussed in this section. According to the EIC vision statement, the EIC should be able to attract diverse participants across the EU, involving newcomers and companies led by women with a target of 35%.

Measuring societal impact indicators at project acquisition does not provide a good indication of projects' contribution to the SDGs[70]. The EIC Pilot has supported technologies that are open to multiple innovations and applications that have not been yet fully explored. Case studies show that beneficiaries have a general idea of how their projects could contribute to pressing human challenges, but for this evaluation, it was not possible to differentiate between aspirational and actual contributions. A more realistic assessment of EIC projects' contribution to the SDGs will be possible after project completion, which could be done through bibliometric and patent analysis of the outputs delivered by the projects.

The objectives set by the attractiveness criterion are at odds with the competitive nature of the programme. The section on EIC Pilot efficiency discusses participation patterns showing that compared to the SMEI, the EIC Pilot has attracted more young companies, but participation has remained geographically skewed towards participants from "Innovation Leader" and "Strong Innovator" regions. This distribution reflects local capacities in generating world-class research and innovations and is aligned with the programme objectives. There are other policy instruments within the EU (Cohesion Policy) that are better positioned to address territorial imbalances. Evidence collected through the case studies and interviews suggests that the availability of national support networks for applicants can play a crucial role in increasing the chances of success (See box below).

Box 5. Examples of national programmes providing support to Horizon 2020 applicants

- → EUopSTART (Denmark) aims to intensify the participation of Danish enterprises and research institutions in European research and innovation. Danish enterprises and research institutions can apply for funding (grant) to cover up to 50 % of the costs connected to preparing an application for one of the calls under Horizon 2020 / Horizon Europe.
- → APRE, the Agency for the Promotion of the European Research (Italy), provides information and training to potential applicants for the EIC. It advises start-ups, researchers, spin-offs and other target groups on the most suitable funding opportunity for their projects (including screening the TRL). It helps prepare

[70] See the results presented in Figure 16.

business plans, provides training to enhance project management and pitching skills, and advises on using intellectual property assets.

→ Enterprise Ireland leads the national support network for Horizon 2020, working to increase participation by Irish companies and academic institutions in the EU R&I Framework Programme. It provides information on the funding opportunities and helps Irish applicants develop the tender.

The EIC project monitoring data did not allow the identification of the gender of the project leader. The name of the contact person that is included in Cordis identifies the name of the person that is responsible for the submission of the project application. By looking at Orbis data, this evaluation was only able to assess the share of Accelerator projects that included a woman on the companies' board. Neither data source was able to determine how many women were leading EIC projects.

The latest report published by Atomico[71] shows that the difference in access to finance between men-only teams and mixed/women-only teams continues to be huge. Men-only teams captured 91% of all capital raised and 85% of all rounds in 2020. The stereotypical image of a tech-savy male entrepreneur is still very dominant. Although such a large gap would justify targeted measures, the need to embed into the programme mechanisms that would favour women applicants has not emerged through the case studies and the interviews. Women's participation would be better supported through specific instruments, such as Women TechEU[72] or the Women Leadership Programme[73], to inspire and empower women in pursuing a career as tech entrepreneurs. Another measure, that has been particularly appreciated by the stakeholders, is the gender-balanced composition of the EIC jury.

Technology and scientific impact

In line with Horizon 2020 impact monitoring, technology and scientific impact indicators were measured by looking at scientific (publications) and technology (patents) production. The limitations of these indicators are well-known and refer to attribution and time lag issues. Anecdotal evidence from the case studies and data from the Innovation Radar were used to complement this analysis.

The Pathfinder already displays substantial scientific production that is on par with comparator programmes. The share of projects with publications, the average number of publications by project, and the share of peer-reviewed articles of the Pathfinder are in line with the average of projects funded by the Marie Curie Actions and the European Research Council in the period 2018 - 2020. Furthermore, 42% of the publications are in high-impact journals implying that they are likely to be disseminated and be influential in their respective fields.[74]

[71] The State of European Tech 2021.

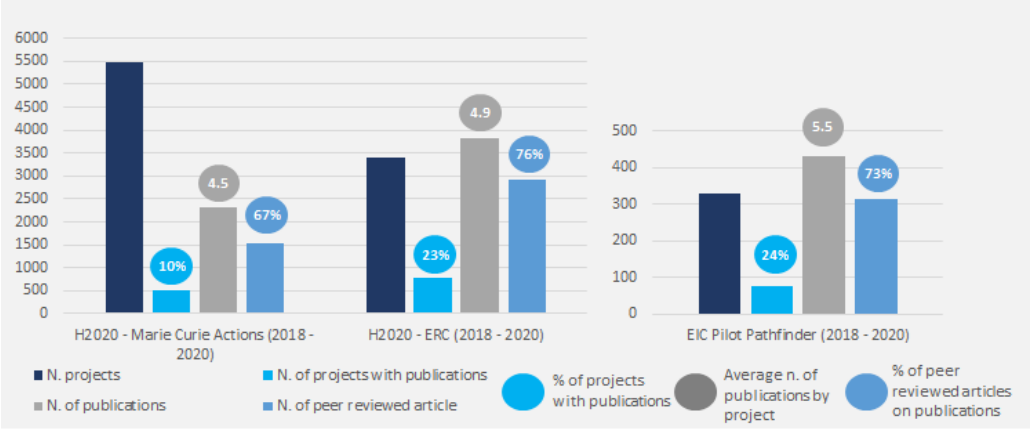
[72] Women TechEU is a new EU initiative funded under the European Innovation Ecosystems work programme of Horizon Europe. The scheme offers coaching and mentoring to female founders, and targeted funding (up to to EUR 75 000 as an individual grant).

[73] Mentoring and coaching provided by the EIC Business Acceleration Services including dedicated networking and pitching events.

[74] Data included in Horizon 2020 monitoring systems which are based on participant's self-reporting.

According to interviewees, the relatively small size of Pathfinder consortia favoured engagement and facilitated project progress towards their objectives.

Figure 30. The production of scientific knowledge by the Pathfinder is on par with Marie Curie's Actions and the European Research Council



Source: CSIL elaboration of eCorda data and data from H2020 Dashboard

Pathfinder projects have not progressed much in delivering innovation outcomes, but they display a higher market creation potential than FET projects (before 2018) and other projects in Horizon 2020. Further analysis of the Innovation Radar data casts some light on the capacity of the programme to translate scientific discoveries into technologies and innovations. Thus far, one-fourth of the EIC Pilot Pathfinder projects (77) have produced at least one innovation[75]. Only one-third of the innovations produced are considered very innovative, while 37% of them are found to be "obviously innovative and with easily appreciated advantages to customers". Up to 5.5% of the reviewed Pathfinder innovations are likely to bring only minor improvements to existing products. The transformation of the innovation produced into commercialised products remains uncertain. Nonetheless, the innovations produced by the Pathfinder have higher market potential than comparator programmes because they focus on new products, services and processes and have more often plans for commercial exploitation.[76]

The majority of Accelerator projects included in the case studies showed progress with their core technology assets but with no evidence yet of scaling up. At the time this evaluation was carried out, almost all projects

[75] It has to be considered that this analysis could not be applied to the entire Pathfinder portfolio, given that projects need to be advanced at least one year to be assesed by the Innovation Radar.

[76] The analysis compared data from the Innovation Radar data for the EIC Pilot Pathfinder and data published in the JRC "Market Creating Innovations in the EU Framework Programme" (2020) for other Specific Objectives and FET projects before 2018. The entire analysis is available in annex.

achieved a TRL between 8 and 9. Two projects were expected to licence production and four to achieve production on a larger scale.

Economic impacts

This analysis was only performed for the Accelerator since the metric proposed by the EIC vision statement is not suitable for capturing the economic impacts of the Pathfinder projects[77]. Economic impacts were measured by looking at the performance of the companies supported. The assessment compared beneficiaries' performance before and after the support and against a comparator group through a comparative and counterfactual analysis[78]. As in the main economic literature[79], the KPIs included changes in turnover, assets and employment. Changes in company valuation were used to assess early signs of scaling up. Finally, The EIC catalytic effect was measured by looking at investment rounds in the beneficiary's companies. Case studies provided further insights on the barriers to and determinants of projects' success.

Main characteristics of the companies supported by the EIC with a valuation >€100 M

Country of origin: top three countries are France (7) Netherlands (6), Finland (5), 18 out of 27 from Innovation Leader regions, 4 from Strong innovators, 1 Moderate and 3 from Israel.

Sector: Biotechnologies (7), Business and industrial services (5) and Healthcare (4)

Size: Small (13), Medium (9), Micro (2)

There are early signs of companies' growth. Based on Dealroom data, in July 2021, 27 Accelerator beneficiaries reached a valuation of more than €100 M.[80] They represent 7% of the sample on which data are available in Dealroom (N=410) and 4% of all Accelerator beneficiaries (N=768). Considering that the sample on which data are available is limited, the share of EIC centaurs might be higher. Although the data limitations do not allow to conclude of whether the target set in the EIC Vision (5% of the portfolio) has been met, the available evidence suggests that the EIC Pilot is on track to achieve this objective. Around 30% of the companies receiving a grant in 2018 saw their employees grow, on average, at a rate above 20% in the three following years.[81] Case study analysis showed that projects progressed in upgrading and improving their core technology assets, but there is

[77] A possible indicator could include the number of spin-offs generated by the Pathfinder project portfolio. Beckert B. Et al. (2018). Visionary and collaborative research in Europe. Impacts of Use-Inspired Basic Research.

[78] The comparative analysis observes differences and similarities between the treated and the untreated groups through descriptive statistics. It cannot predict if the observed differences (similarities) can be attributed to a specific cause (the public intervention). The counterfactual analysis assesses the existence of a causal relationship between the observed outcome and the intervention and provides an estimate of the impacts compared to what would have happened in the absence of the intervention.

[79] Bibliographic references are included in the methodological annex.

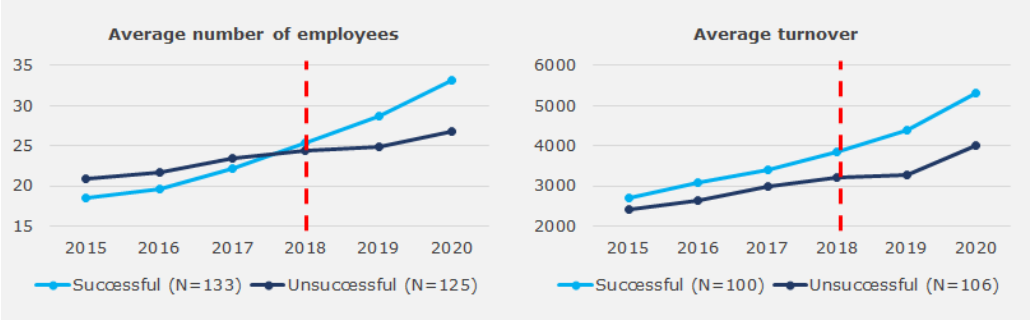
[80] These are the companies whose minimum valuation is above €100 M. If the companies with a minimum valuation below €100 M but a maximum valuation above €100 M are included, the number of companies that can be considered centaurs is 44.

[81] Orbis data based on the number of employees in the year of application.

no evidence yet on commercialisation, although some companies reported that they were ready to scale up production and staff or to licence production.

Companies that received EIC support performed better than other applicants when compared for some key performance parameters (Figure 31). The analysis considered EIC applicants (i.e., applicants that submitted high-quality proposals and were selected for the interview) and Accelerator beneficiaries to the 2018 calls. Data shows that, on average, before accessing the EIC, beneficiary companies were smaller and on a growth path that strengthened after the EIC support. This result can be interpreted as a positive sign of the programme's capacity to spot and select entrepreneurial and innovative talent. The counterfactual analysis[82] results show a positive causal relationship between the EIC support and the companies' capacity to generate additional jobs.

Figure 31. Companies that received a grant from the Accelerator outperformed their peers



Source: CSIL elaboration on ORBIS data

However, it is important to stress that a more revealing analysis of economic impacts should be based on a longer time horizon than was possible for this evaluation. The short-term positive impact on beneficiary companies' turnover and staff[83] reveals the immediate effects of the grant and cannot be considered a sign of successful product commercialisation. Evidence collected through the case studies confirms this finding, i.e. resources were hired to work on getting the products/services ready for the market, but large scale production has not yet started. Beyond access to finance, companies also face other constraints including regulatory and technical barriers. It remains an open question to be investigated by future evaluations whether the Accelerator was able to sustainably trigger growth in the beneficiary companies.

Applying an extended time horizon in assessing economic impacts is even more important for the EIC Fund. Literature shows that deep tech VCs need to work with a 10-15-year lifetime investment. The profitability of equity investments also

[82] Results and methodology discussed in the methodoogical annex
[83] Causality is statistically significant only for employment (number of workers).

tends to be negative in the first years (generally up to five) because the investee company is not able to yield a positive return[84].

At the portfolio level, with a longer timeframe, a counterfactual analysis is useful to establish causality and can be complemented by a cluster analysis exploring the possible determinants of success. This evaluation tested the feasibility and soundness of a counterfactual analysis when unsuccessful high-quality applicants are used as a control group. The results obtained through the econometric analysis are robust and statistically significant (for employment), but cannot be generalised to the EIC Pilot because the analysis was only applied to the projects selected in 2018.This approach has been largely employed in the literature and has the advantage of reducing the cost of identifying the control group. In addition to a counterfactual analysis, a cluster analysis of beneficiary companies would allow to identify the profiles of the most and least successful companies and whether this can be related to external factors such as location and sector or the company's pre-existing assets.

Main characteristics of companies receiving large investment rounds

Country of origin: top three countries Spain (5), France (4), Finland (2) and Israel (2).

Types of rounds: Most had series B and series C rounds from multiple investors. Most had seed and series A investments before EIC.

Finally, the EIC Pilot is on track to attract additional investments in the financed projects. Overall, Accelerator projects matched EIC grants with €460K for each €M of funding (eCorda data). According to Dealroom data, as of July 2021, 156 (20%) of the 769 beneficiaries of the Accelerator received other rounds of investments after the EIC. There are 19 companies that raised more than ten times the amount raised by the EIC, and ten of these have reached a valuation of over €100 M. On average, each supported company in 2018 received 2.8 times the amount awarded by the EIC Pilot in subsequent (public and private) investments, which is very close to the market capital multiple targets of 3 set in the EIC Vision statement. According to survey respondents and the case studies, participation in the EIC has strong reputational benefits that can make companies more visible internationally and attractive to other investors.

Coherence

This section assesses the strategic positioning of the EIC within the EU R&I policy mix and other similar support measures provided by the EU, European countries and regions.

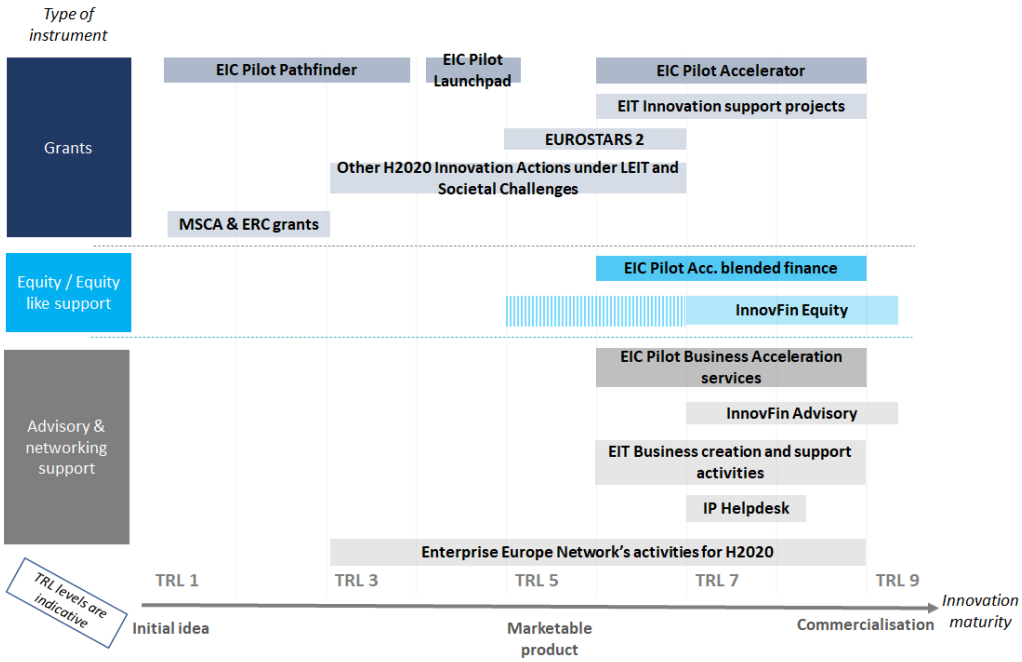
Internal coherence

The EIC Pilot has a distinct position within the EU R&I policy mix (Figure 32). Within Horizon 2020, the EIC Pilot has a unique target and configuration that allows the programme to respond to needs that are not addressed by other

[84] Robert Gampfer et al (2016). Access to finance for high-growth innovative enterprises: analysis of national support instruments.
IDB (2017), Comparative Study of Equity Investing in Development Finance Institutions.

programme parts. This internal coherence has been kept with Horizon Europe, where the EIC is a key piece under the Innovative Europe pillar.

Figure 32. The EIC Pilot strategic positioning within Horizon 2020



CSIL

The EIC uniqueness in the EU R&I policy mix is built on the following aspects:

- It is the only instrument designed to cover almost the entire TRL spectrum, with a view of translating breakthrough innovations carried out in universities and research centres into the economy through the development of commercially exploitable innovations leading to the scale-up of innovative SMEs.

- It pursues a portfolio approach that is set to follow the most promising projects through their technology asset development from the very early stage. This aspect was not properly tested in the pilot phase, which lacked a proper instrument to connect the two programme parts. This missing linkage has been introduced by launching the transition calls and recruitment of Programme Managers in 2020.

- It supports the commercialisation of game-changing innovations across all sectors and technology domains.

- The availability of blended finance for innovative, high risk and not yet bankable entrepreneurial projects.

Synergies with the European Institute of Innovation and Technology were not clearly defined and tested in the Pilot phase, but the current Memorandum of Understanding has put in place mechanisms for collaboration. Like the EIC Pilot, the EIT supports innovative European start-ups and companies. When the EIC Pilot was established, there was no formal cooperation agreement between the two programs, which was signed in January 2021. The MoU identifies synergies and complementarities by building on specific features of the two programmes. While the EIT supports institutions from all sides of the knowledge triangle to build innovation ecosystems and support beneficiaries such as start-ups, scaleups, SMEs and Alumni in their innovation journey, the EIC support individual companies and research teams. The EIT, through its Knowledge and Innovation Communities (KICs), pursues a thematic approach based on the societal challenges defined in Horizon's work programme, whereas the EIC works (mainly) through bottom-up calls that encourage innovations from a broader spectrum of technology domains. Several interesting initiatives, that can benefit both programmes' participants, have been launched. In particular, the EIT KICs are now set to feed the EIC project pipeline with promising projects, start-ups and scaleups while reducing the administrative burden for applicants via the dedicated Fast Track to EIC Accelerator. EIC Accelerator participants can also access Business Acceleration and Support services from four EIT KICs (EIT Digital, EIT InnoEnergy, EIT Climate-KIC, EIT Health).

On-going collaboration between the two programmes

The 'Fast Track scheme', introduced under Horizon Europe, allows the EIC to give a streamlined treatment to applications from projects already funded by the EIT KICs (and other eligible EU schemes).
Access to EIT KICs flagship programmes, has been granted to EIC beneficiaries, examples include access to specialized business acceleration services.

The EIC Pilot complemented other parts of the Horizon 2020 Work Programme, notably the one on "Innovation in SMEs". Until 2018 the "Innovation in SMEs" work programme comprised both the SMEI and the INNOSUP Actions. INNOSUP Actions mainly target intermediary organisations and consist of measures stimulating collaboration opportunities, peer-learning, and testing new approaches that facilitate SMEs' access to customers, capital and competencies. With the creation of the EIC Pilot, the separation of the two initiatives[85] brought more clarity to their different but complementary objectives. Whilst the EIC Pilot directly supports the actors implementing the innovation, the goal of the INNOSUP Actions is to strengthen the dynamism and the resilience of the ecosystem in which these actors operate.

In Horizon 2020, the provision of equity investments in innovative companies was delivered through the InnovFin programme, whose management was delegated to the European Investment Bank (EIB) and the European Investment Fund (EIF). The scheme supported European business growth, R&I projects from the early stage up to the expansion and growth stage. Unlike the EIC Pilot,

[85] In the Work Programme 2018 – 2020, "Innovation in SMEs" focused on INNOSUP Actions, whereas a separate work programme was elaborated for the EIC Pilot.

InnovFin provided equity investments through selected financial intermediaries that were responsible for companies' due diligence.

The design of Horizon Europe has further clarified the positioning of the EIC with respect to the EIT and the INNOSUP Actions (included in the "European Innovation Ecosystems") by gathering the three initiatives under Pillar III "Innovative Europe". The three initiatives will work in synergy and will complement each other.

External coherence

There are limited overlaps with other European and national programmes and substantial complementarities. Survey results for both successful and unsuccessful applicants show that there are limited alternatives to the EIC. Stakeholders and beneficiaries interviewed for this evaluation agreed that the EIC, with its target on deep tech, breakthrough innovation, European dimension and substantial funding, offers unique advantages to beneficiaries than other national or regional programmes cannot match. National and regional schemes, often supported by the EU structural funds, have a limited geographical dimension and a focus on incremental innovation. Even in countries where support to innovative companies through a mix of grants and financial instruments is available, the EIC stands out as the only programme having sufficient breadth and providing substantial support to deep tech companies, requiring investment in equipment, facilities and new staff. Some stakeholders consider that even if there were some overlaps, these should not be regarded as a major issue given the existing gaps for innovation financing compared to China and the US.

Horizon 2020 made important steps to improve synergies with the European Structural and Investment Funds fund (ESIF), **although with mixed results for participant SMEs.** The Seal of Excellence (SoE) has been an example of effective synergies between the SMEI (and later the EIC Pilot Accelerator) and ESIF. The Seal of Excellence worked as a quality label awarded to high-quality proposals submitted for funding under the SMEI calls but could not be funded under the available budgets. Companies holding the SoE could be granted ESIF support through a faster assessment procedure, provided that the respective Managing Authorities integrate the schemes within ESIF programme calls.[86] The SoE has also been integrated into national schemes supporting innovative SMEs (see box below). However, the usefulness of the SoE depended on local conditions, including the availability of structural fund resources for financing individual innovative SMEs and on the administrative procedures related to eligible costs. In particular, the budget ceiling for Phase II SoE holders was likely to be lower in regional and national schemes compared to the EIC.

[86] JIIP (2017) Synergies between Framework Programmes for Research and Innovation and European Structural and Investment Funds.

Box 6. Examples of national SME programmes that integrated the SoE

- → Czechia. In 2016 and 2017, the technology agency of the Czech Republic funded projects in the frame of the GAMA programme with a maximum of 55% of the total costs. The scheme was dedicated only to Phase I holders in Czechia.
- → Slovenia. SoE Phase II holders based in Slovenia were offered co-funding by the executive agency Spirit in the period 2017 - 2019. The same categories of costs were considered eligible as in the SMEI Phase II. SoE Phase I holders were offered a €35,000 lump sum to co-finance their feasibility studies by the executive agency Spirit.
- → Sweden. VINNOVA, the Swedish innovation agency, has established the Runner-up programme targeting SoE Phase I holders. VINNOVA relies on the outcome of the Horizon 2020 evaluation. After the proposal has been granted funding, the project will follow the same rules and reporting as all the other projects supported by VINNOVA. VINNOVA also has an agreement with the Enterprise Europe Network to coach Runner-up participants.

Another initiative that is complementary to the EIC Accelerator is the Start-up and Scale-up initiative[87]. This initiative was launched in 2016 and aims to remove barriers to scaling up in the single market with ecosystem building projects and develop networking opportunities by connecting clusters, people, and local ecosystems across Europe. Although the EIC Pilot and the Start-up and Scale-up initiative deal with different barriers and offer different types of support, they pursue a common objective – accelerate the company growth of the best EU scale-ups- and complement each other. Whereas the EIC Pilot did not mention any collaboration between the EIC and Startup Europe, the EIC 2021 Work programme envisages a new wave of actions under the Startup Europe initiative targeting specifically EIC beneficiaries. The actions will target digital and deep tech start-ups that have received support from EIC to support their growth in Europe. Local digital and deep tech start-up ecosystems will be supported to foster cross-border acceleration activities, especially in widening countries.

The EIC Fund addresses an existing market gap, but its functioning is not yet stabilised making its strategic positioning still not well understood by stakeholders. Besides InnovFin which was part of Horizon 2020, other complementary equity instruments, but not necessarily focused on game-changing innovation, are the European Fund for Strategic Investment (EFSI) Equity Instrument and the COSME Equity Facility for Growth. In the current programming period, EIC applicants and participants can benefit from InvestEU, through different channels (see box on the left).

Possible synergies with InvestEU

Non selected bankable projects can be channelled to InvestEU that will carry out its own due diligence for approval.
Beneficiaries preferring to blend their EIC grant with a loan can be directed to InvestEu.

Following scale-up, the beneficiary becomes bankable and is channelled to InvestEU for equity or debt investments that could complement or replace the EIC Fund.

Stakeholders do not have a clear perception of how the EIC Fund envisages positioning itself in the VC market and with respect to other available equity-like

[87] European Commission COM(2016) 733 final Europe's next leaders: the Start-up and Scale-up Initiative {SWD(2016) 373 final}

support schemes. It is, in particular, the co-investment rule that would make the EIC Fund less relevant for young innovative SMEs and more similar to existing products. The functioning of the EIC Fund has not stabilised yet to bring sufficient clarity about its main characteristics and advantages for applicants compared to alternatives. Future evaluations will also be better positioned to assess to what extent the synergies identified between the EIC and InvestEU deliver the expected results and benefits for participants.

There are duplications among several initiatives at the EU and national levels regarding the provision of training and coaching. Generalist and specialised business acceleration services are also available throughout Europe[88]. Survey and interview respondents reported that some of the services provided by the EIC business acceleration services could be available through other national and European programmes, including through the EIT. At the EU level, the EIC Pilot partially relied on the expertise of the Enterprise Europe Network (EEN), as it facilitated the coaching services of the BAS. Accelerator beneficiaries could benefit from the innovation and internationalisation services of the EEN, including an assessment of the firm's innovation management capacities and the identification of a suitable coach or consulting package to address the gaps identified. However, some potentialities stem from reinforced cooperation between the EIC and the EEN, which was not fully exploited. Being a network of intermediaries well-established at the national and regional levels, the EEN can help the EIC reach the target groups. This aspect has been leveraged in the full EIC starting from 2021.

EU added value

This analysis assesses the extent to which the benefits of the EIC Pilot could have been delivered in the absence of the programme. It is based on qualitative evidence collected through the survey, the interview programme and the case studies and on the results of counterfactual analysis.

Overall, the EIC Pilot had strong and well-acknowledged EU added value. According to beneficiaries and stakeholders, the European dimension of the EIC and its focus on disruptive innovation and breakthrough technologies create substantial signalling effects that national programmes could not have delivered. Examples from the case studies also show that the generous funding that is not available in national programmes allowed beneficiaries to focus on their projects and complete them, rather than continuously looking for sponsors and small grants that rarely cover the needs of deep tech ventures. For academics and researchers, participation in the Pathfinder is considered less prestigious than being awarded a European Research Council (ERC) Grant, but they appreciate the international dimension of the EIC and the possibility to work in consortia that also include private companies where technology application can be tested.

[88] A mapping of available acceleration services is available at Heatup Startup Europe website. The map is not comprehensive, but it provides a good overview of the available acceleration services across the EU.

The results of the counterfactual analysis suggest that, although unsuccessful applicants might have leveraged other sources of funding, their impact on the companies' growth is more limited.[89] Although the analysis could not control for other additional forms of support received by the companies, it showed that the benefits of the EIC support could not have been fully delivered in its absence.

EIC support was key to bringing projects to life, and it could rarely have been replaced by alternative funding. Projects would not have been implemented or would have been continued on a smaller scale without EIC support. Survey results and case studies show that without EIC funding, almost two-thirds of the Pathfinder projects would not have been implemented since they would have been unable to obtain the necessary financing and set up an international consortium. Indeed, the majority of unsuccessful Pathfinder projects never came to life. On the other hand, Accelerator projects are more likely to be carried out anyway, albeit at a smaller scale and with delays of up to 3 and 5 years. Around 60% of high-scoring declined Accelerator proposals were implemented at a smaller scale, with less substantial results and benefits, resorting to private financing (business angels, friends or family, or venture capital investors) or a combination of private and public funds. The absence of alternative forms of funding is the most common reason why declined proposals were not implemented.

Business accelerator services' EU added value is limited where the demand is met by other public and private initiatives. The European added value of the business acceleration services stems from its European dimension, concerning services that support companies to expand beyond their national markets. However, evidence collected through the survey, interviews and case studies suggests a lower European added value of business acceleration services for training and coaching services. In the case studies, there were instances where these services did not meet participants' expectations that would have expected to receive more specialised and tailored services. Although the offer of quality business support services is uneven across the EU, many providers can deliver similar services and participation can be supported by structural funds. Compared to the EIC, these actors may leverage more specific knowledge of the local systems and the reference markets.

[89] The analysis shows a positive causal relationship between the EIC support and the companies' capacity to generate additional jobs, with successful companies increasing their employees more than unsuccessful ones. On average, successuful applicants hired in the years after the support two additional employees as compared to unsuccessful applicants.

CONCLUSIONS AND LESSONS LEARNT

Conclusions

Overall, this evaluation found that the Pilot was instrumental in preparing stakeholders for the transition to a fully-fledged EIC under Horizon Europe and laying the foundations of a programme based on continuous learning and adaptability. The transition from the SMEI and FET to a radically new instrument was challenging and well managed, although some of the programme's novelties could not be fully developed and tested in the pilot phase.

The sections below present the conclusions of the evaluation team organised around the main evaluation topics set out in the Terms of Reference for this study.

Relevance and fit for purpose of the novelties piloted in the EIC

The transformation of the SMEI and the FET in the EIC Pilot and its subsequent transition to an Enhanced Pilot shows the adaptability and flexibility of the EU FP to respond to changing circumstances and emerging needs. The EIC Pilot met the objective of reorienting the FP support for innovation by designing a programme that integrates and connects science with innovation and provides funding for scaling-up. By bringing together the FET and SMEI, the EIC sharpened its focus on deep tech and shifted away from incremental and digitally driven innovation, for which there is already significant public support and private investments. It also pushed for better integration and collaboration between scientists, innovators and entrepreneurs. Through the establishment of the EIC Fund, it tackles market failures, such as the VC underinvestment in impactful technologies for societal challenges.

However, targeted instruments to support the transition of research results into feasible and commercially valuable technologies were only added at a later stage of the Pilot and could not be fully assessed by this evaluation. In principle, the combination of instruments that have been set out to address the transition objective is well-designed since it considers that innovation development and market deployment can occur in multiple ways. Support is also provided by taking into account the specific characteristic of the projects. The proactive programme management approach was inspired by the experience of the US DARPA as a way to steer and progress parts of the Pathfinder project portfolio towards EU policy objectives. When this evaluation was carried out, the programme managers were still being recruited and their roles defined. Whilst it was not possible to assess this process in the timeframe of this evaluation, the operationalisation of the proactive management approach will be an important aspect in future evaluations.

The bottom-up approach pursued by the EIC Pilot is valuable and has delivered a diversified project portfolio cutting across different scientific, technological, sectoral and application fields. Projects included in the EIC portfolio cover both trending deep tech technologies, such as AI, quantum computing, photonics, blockchain, biotech, robotics and advanced materials,

along with expanding application fields such as electric and autonomous vehicles. The Pathfinder portfolio is well-positioned to nurture breakthrough innovations in the future, including projects in highly speculative technologies where Europe's position is strong (e.g., plant communication, spintronics, bioelectronics, aluminium-ion batteries, airborne wind turbines, artificial photosynthesis). EU policy priorities for transitioning to a green, digital and healthy society are also well covered by the project portfolio of the EIC Pilot.

The EIC Fund is underpinned by well-justified public policy goals and market needs, but in the early stage, there were problems in understanding its rules and procedures. The blended finance option seems particularly relevant for deep tech start-ups, which need considerable resources to step up their research. Nevertheless, stakeholders did not have a clear perception of how the EIC Fund envisages positioning itself in the VC market and with respect to other publicly available equity-like support instruments. A contentious point on the Fund's functioning pivoted around the interpretation of the non-bankability and co-investment criteria, whose complementarity and rationale were not always fully understood by stakeholders. Communication on these issues has improved over time.

Efficiency in the implementation of the EIC Pilot

The Accelerator has successfully attracted fast-moving and young companies that were not participating in the FP, whereas barriers to entry for newcomers are higher for Pathfinder participants. The Accelerator applicants and beneficiaries are more innovative than average European SMEs, and, in line with its objectives, the programme has increasingly attracted small and fast-growing companies. The Pathfinder is a science-driven programme, and, as such, it has the bulk of its participants from universities and research centres. However, participation patterns show a strong geographical concentration and the pivotal role of a few organisations in setting up consortia for accessing Pathfinder funding. This is particularly the case for large and decentralised organisations that are able to involve different teams in multiple Pathfinder projects. Moreover, private sector participants in Pathfinder mainly come from companies connected to universities and research centres, and there is scope for further expanding SME participation to accelerate technology development and application (engineering phase).

The EIC is less accessible for entities located in EU widening countries. Application to the Pilot overwhelmingly came from the most dynamic and innovative European regions**.** Entities located in widening countries had lower success rates but also expressed a much lower demand for funding. Unlike traditional start-ups, deep tech companies require complex ecosystems to thrive. These ecosystems are based on multiple types of players, including actors in the knowledge triangle (education, research and innovation) and financers (venture capitalists, public programmes). Support provided by national contact points and national programmes can also make a large difference in generating interest and capacity for applying to the EIC. In less developed regions, there are not yet the conditions to generate a critical volume of high-quality applications.

For the Accelerator, low success rates were not commensurate to the effort and cost involved in applying for the EIC Pilot, but the new application rules have lowered barriers for applicants. Oversubscription is a problem that the EIC inherited from the SMEI, but it has worsened over time and became an important factor holding back applications from companies, especially in regions with the lowest success rate. Because of budget limitations, too many high quality proposals were left without EIC financing, generating the perception that the outcome of the selection was too dependent on luck. Most Accelerator applicants recruited specialised consultants to navigate the application process, but this strategy was not sufficient to ensure success. Further simplification of the application process is probably needed to lower barriers to SME participation. A positive change has already been implemented in Horizon Europe, where the new rules for applying to the EIC are based on a two-staged process that reduces the number of unsuitable proposals that reach the full proposal stage.

Grant funding flowed well, but the recurrent delays in approving the beneficiaries that applied for the blended finance instrument have been detrimental to the reputation of the EIC Fund. Companies that were proposed for financing by the EIC Fund had to deal with a lengthy decision process. Although there has been progress in reducing the delays of the Fund's financing decision, this process still takes too long, it creates uncertainty for the companies proposed for the equity investment and raises some questions about the EIC's ability to act quickly for supporting fast-growing companies.

Continuous changes during the Pilot have taken stakeholders aback, but the understanding of the EIC's main features has improved during the pilot phase. The SMEI was already a new instrument in Horizon 2020, and the transition to a different programme configuration took many applicants and support services unprepared. Initially, the focus on deep tech and disruptive innovation was not well understood. Applicants also had problems understanding that through the EIC Fund, the programme was transitioning from a grant and subsidy-based funding to an equity based funding model. After three years, stakeholders have a better understanding of the programme's objectives and participation requirements, but there is a sense of fatigue towards having to adapt to continuous changes, and more stability would be appreciated.

Early signs of the impact of the EIC Pilot

This evaluation identified early signs of progress, but a more complete assessment of the programme's impact requires a longer timeframe. Data on Accelerator beneficiaries show that the selected companies were on a growing path. However, the positive performance shown by data on multiples, turnover and employment may be the result of the immediate effects of the support received and will have to be confirmed by future evaluations. A longer timeframe is also needed for an assessment of the EIC Pilot's contribution to societal and technology objectives and for assessing the full scale of the impacts of the novelties introduced by the EIC in the FP.

Finally, on the KPIs used to measure the impact of the EIC Pilot, this evaluation identified some issues concerning their relevance, timeliness and feasibility. The indicators proposed in the EIC vision Statement focus on measurable economic indicators but do not account for appropriate measures of progress for Pathfinder projects. The proposed societal impact indicators, which combine contribution to societal value with inclusiveness objectives, have important measurement issues that should have been considered (e.g., the lack of gender-disaggregated data for applicants and participants).

The positioning of the EIC Pilot within the EU and Member states' R&I policy mix and its European added value

The EIC has a unique position within the EU R&I policy mix, and there are signs that synergies are being harnessed with other programmes in Horizon Europe. Within Horizon 2020, the EIC Pilot had a unique target and configuration that set the EIC for responding to needs that were not addressed by other parts of the FP programme. However, the Pilot phase was too short and too intense to institutionalise and put in operation new schemes that would have helped build bridges with other existing instruments, such as the EIT. In this respect, the EIC design identified some pertinent collaboration areas, but these were only operationalised in the new programming period 2021-2027 when a Memorandum of Understanding between the EIC and the EIT defined the terms of collaboration between the two instruments.

The EIC stands out as the only programme having sufficient breadth and scale to make a difference. Due to the unique features and objectives of the EIC, there are limited overlaps with other European and national programmes. Even in countries that provide support to researcher consortia or innovative companies through a mix of grants and financial instruments, the EIC stands out for its distinct advantages. Stakeholders believe that the European dimension of the EIC, the sizeable funding, the EIC reputation and the focus on disruptive innovation and breakthrough technologies altogether generate significant benefits for participants that cannot be delivered by national programmes.

The EIC has strong European added value, although this appears to be more limited in relation to the provision of business coaching and training under the Business Acceleration Services. In most cases, without the EIC financial support, projects would not have been implemented or would have been continued only on a smaller scale. Participants appreciated the European dimension of the business acceleration services (e.g. meeting with international corporate and investors) but also reported a few mismatches between the needs and the types of services provided that have affected participants' perceptions of their added value within the EIC. Targeting of the services and their promotion to the appropriate participant profiles has been an issue. Most EIC participants are located in strong innovator regions where demand for the services provided by the EIC can also be met locally by other public and private initiatives, whereas the EU added value is stronger in regions where the offer of high quality is more limited.

Lessons learnt

The lessons learnt by this evaluation focus on three main areas of improvement for the EIC.

Lesson 1. There is scope for improving the offer of training and coaching services under the Business Acceleration Services.

When collecting stakeholders' opinions, this evaluation found a modest European added value and complementarity for the training and coaching services offered by the Business Acceleration Services, while there was a perception of higher values for other services such as matchmaking events (meet the corporate/procures). In particular, the need to align the offer of these services to participants' needs and expectations has emerged, alongside the availability of similar services through national and other European programmes. Partnerships with other instruments in Horizon Europe, such as the EIT, have already been established and constitute a good example for building synergies and complementarities with existing programmes.

Lesson 2. The EIC Fund should continue to consolidate its credibility by shortening the time-to-finance decision and effective communication.

The Fund can play an important role in catalysing investments in areas that are underinvested by private investors but, to fully meet its objectives and reduce uncertainty for beneficiaries, it needs to considerably speed up the process leading to the signature of the financing agreement. In the pilot phase, delays were due to the novelty of the instrument, both for the EC and the beneficiaries, whereas in the current programming period there were legal difficulties in transitioning the Fund under Horizon Europe. Although some of the initial difficulties have been addressed and delays reduced during the pilot, the operations of the Fund have been delayed in the transition to Horizon Europe which negatively affected the Fund's reputation. Stakeholders' expectations about the benefits and implications of receiving the Fund's support could be managed by further communication through national contact points, SME and start-up associations.

Lesson 3. The EIC Pilot's impact assessment framework does not fully align with Horizon Europe's impact assessment framework.

The EIC impact assessment framework was developed by the EIC pilot Advisory Board in the Pilot phase to complement the FP assessment framework, and focused on new areas to capture the programmes' objectives, including its support for scale-ups. However, when assessing all EIC Pilot components, this evaluation had to add specific KPIs from the FP assessment framework to report on scientific and technological progress alongside economic performance. The transition from research to the market is an important objective of the EIC that is not currently covered by specific indicators of achievements, such as TRL progression or the number of spinoff companies. Economic impacts indicators are relevant for the Accelerator, but cannot be used for Pathfinder projects.

The EIC Pilot has made commendable efforts in trying to achieve more balanced participation, especially for women. Good examples of these initiatives include the Women TechEU and the Women Leadership Programme, along with gender-balanced jury composition. Nevertheless, identifying attraction and inclusiveness as the programme's KPIs creates possible conflicts with the award criteria for project selection and in particular with excellence in science and innovation. The promotion of more geographically and gender-balanced participation in Horizon 2020, as well as in Horizon Europe, are cross-cutting objectives reflecting the FP's goal to foster participation from all groups and eligible countries, whereas specific measures are designed to enhance wider participation (e.g. by strengthening innovation systems).

The analysis of the societal impacts should consider the time that is needed for the materialisation of these effects that are hardly observed in the short period. Actual impacts can be measured through bibliometric and patent analysis once the technology applications have become clear. Finally, economic impact targets could be designed to integrate success alongside failure, for instance by identifying the share of the portfolio that is expected to achieve high growth and significant catalytic effects instead of using averages across the entire portfolio.

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The European Innovation Council (EIC) Pilot was launched in 2018 to support breakthrough innovation and scaling up of European deep-tech start-ups in view of setting up a fully-fledged EIC for the Multiannual Financial Framework 2021-2027. The study looks at how the programme was delivered, early results achieved and identifies barriers and drivers to deliver on the EIC pilot objectives, providing lessons learnt to improve the fully-fledged EIC in Horizon Europe.

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