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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A New European Innovation Agenda

{SWD(2022) 187 final}

1. LEADING THE NEW WAVE OF DEEP TECH INNOVATION

Innovation is essential to drive Europe's competitiveness and to ensure the health and well-being of its citizens. Innovation shapes markets, transforms economies, stimulates step changes in the quality of public services and is indispensable to achieve the overarching objectives of the twin green and digital transition.

A new wave of innovation is on its way: deep tech innovation, which is rooted in cutting edge science, technology and engineering, often combining advances in the physical, biological and digital spheres and with the potential to deliver transformative solutions in the face of global challenges. The deep tech innovations that are emerging from a growing cohort of innovative startups in the EU have the potential to drive innovation across the economy and society. This can in turn transform the EU's business landscape and associated markets and help addressing the most pressing societal challenges, including by achieving the UN Sustainable Development Goals.

Europe has a long and proud history in innovation and is optimally positioned to lead this wave of deep tech innovation for four underlying reasons.

First, the EU's leadership in science. The EU is a powerhouse in knowledge production, and deep tech innovation exploits new science and technology insights based on the highest standards of ethics and integrity. With 6% of the world population, the EU is responsible for one fifth of all top-quality publications[1] in the world[2]. Moreover, EU companies are global leaders on high-value green patents and green patents in energy intensive industries.

Second, Europe's strong industrial base and increasingly vibrant startup ecosystem. Deep tech innovation results in physical products rather than pure software services[3] and therefore often benefits from strong partnerships with leading industries. The partnerships fostered between companies and with researchers through EU programmes alongside policies such as the New Industrial Strategy[4] and associated initiatives such as the European Chips Act[5], enable the development of strong EU propositions and value chains in deep tech enabled sectors.

Third, ambitious framework conditions conducive to innovation in the single market. Deep tech innovation targets solutions to key societal challenges. As evidenced by the EU's position in wind energy[6] for example, bold policy choices, such as on climate change and environmental protection, coupled with close cooperation between the public and private sector and the strengths of the single market have created the conditions for European companies to thrive in deep tech enabled sectors of the future.

[1] Defined as the top 10% most cited publications
[2] Science, Research and Innovation Performance of the EU (SRIP) report 2022.
[3] 83% of deep tech ventures are engaged in building a physical product (Source: Boston Consulting Group).
[4] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en
[5] https://digital-strategy.ec.europa.eu/en/policies/european-chips-act
[6] Half of active companies are headquartered in the EU, and European Original Equipment Manufacturers (OEMs) also hold a globally leading position COM(2021) 952 final, October 2021

Finally, Europe's talent base. Deep tech startups and innovation need access to a strong supply of Science, Technology, Engineering and Mathematics (STEM) and entrepreneurial skills, and associated capabilities that adhere to the highest research and development values and principles. Europe has some of the best higher education institutions (HEIs) and research organisations in the world and their vital contribution to the EU's education, research and innovation agenda continues to be strengthened through initiatives such as the new European strategy for universities[7]. With 17.5 million individuals in tertiary education, over a million researchers, and increased licensing, patenting and startup creation activity in many countries, these institutions are already playing a critical role in ensuring the flow of skilled individuals and ideas for deep tech innovation.

To leverage these strengths, the EU will take forward concrete new measures. These measures will enable innovators including deep tech startups to take better advantage of the single market and attract new institutional investors to strengthen financial and capital markets to commercialise and scale deep tech companies here in the EU. The new measures will help individuals become better equipped with relevant skills, to enable the potential of our diverse population, especially women, to be realised and to attract talented individuals to come and work in the EU. The proposals on regulatory frameworks will help the EU keep pace with rapid technology development to enable deep tech innovations to be tested and subsequently commercialised in the EU.

The uptake of deep tech innovation and the ability of regions across the EU to contribute to, and benefit from innovations will also be strengthened through actions to address the persistent innovation divide across Member States and regions. This will enhance internal cohesion, and deliver wider economic and social benefits - at present, the highest performing regions are up to nine times more innovative than the lowest performing ones[8] and technological output as measured by patents is concentrated in regions hosting the headquarters of large companies and with a high share of manufacturing companies[9].

Recent global trends also necessitate prompt action and underline the need to mitigate strategic dependencies in key technologies and critical raw materials. In keeping with the ambitions of the recent REPowerEU Plan[10] that builds on the Fit for 55 proposals, the EU must wean itself from its dependence on Russian fossil fuels well before 2030 by boosting energy efficiency gains, including through the uptake of circular economy principles, and accelerate the development and deployment of clean energy technologies notably from renewable sources including renewable hydrogen.

Prompted by considerations for a more circular, digitalised and resource efficient economy, the pandemic, or Russia's aggression against Ukraine, companies will need to build new capabilities and seek trusted partners to build supply chain resilience, develop new trade opportunities and collaboration given the increasingly international nature of innovation. Horizon Europe, Erasmus+ and other EU programmes and policies have consistently supported such cooperation

[7] Commission Communication on a European strategy for universities
[8] European Commission, (2022), The Eighth Report on Economic, Social and Territorial Cohesion based on Regional Innovation Scoreboard 2021.
[9] Staff Working Document accompanying the New European Innovation Agenda, section 2.3.1 Innovation Divide.
[10] REPowerEU Plan COM(2022) 230 final.

with trusted partners, including through Association agreements. The Communication on the global approach to research and innovation[11] provides an improved framework to develop such cooperation. Further, the new EU global connectivity strategy, the Global Gateway[12], and the Communication on the trade policy review[13] underline the importance of deepening international partnerships, diversifying trade relations and leveraging the openness and the attractiveness of the EU's single market.

The measures in this Communication, grouped under five flagship areas, can work in concert to leverage the strengths of the single market, strong industrial and talent base, stable institutions, and democratic societies to drive deep tech innovation in the EU, deliver on the opportunities offered by the twin transition and build lasting global partnerships while meeting the need for future open strategic autonomy. The measures build on past and ongoing initiatives, to improve the EU's innovation performance alongside the objectives and priorities of the new European Research Area[14] (ERA), the European Education Area (EEA)[15], the European strategy for universities, the Digital Education Action Plan[16], and the Digital Decade goals[17] and associated targets of 20 million ICT specialists by 2030. The goal of this Communication was also shared by the Conference on the Future of Europe in its final report of May 2022, calling for "Ensuring greater participation of startups and SMEs in innovation projects as this increases their innovative strength, competitiveness and networking[18]. The Communication also provides an overview of the EU's innovation performance, examined in greater detail in the accompanying staff working document.

2. EUROPEAN PERSPECTIVES – CHALLENGES AND FLAGSHIPS

2.1. Access to finance for deep tech scale-ups

2.1.1. Challenges

Europe is amongst the fastest growing regions in private capital investment[19]. Between 2016 and 2020, it experienced a faster growth than China and the US[20], albeit from a lower base. European startups also accounted for 33% of all capital invested globally in rounds of up to USD 5 million compared to 35% for the US[21].

[11] https://ec.europa.eu/info/sites/default/files/research_and_innovation/strategy_on_research_and_innovation/documents/ec_rtd_com2021-252.pdf
[12] JOIN(2021) 30 final
[13] Communication on the Trade Policy Review (europa.eu)
[14] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628&from=EN
[15] https://education.ec.europa.eu/
[16] https://education.ec.europa.eu/focus-topics/digital-education/digital-education-action-plan
[17] Europe's Digital Decade: digital targets for 2030 | European Commission (europa.eu)
[18] https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy/conference-future-europe_en#final-reports-and-proposals: measures 5 and 6 in the proposal "Sustainable Growth and innovation", measures 7,8 and 19 in the proposal "Enhancing EU's competitiveness and further deepening the Single Market", and the proposal "Digital innovation to strengthen the social and sustainable economy".
[19] Data from Invest Europe, 2022.
[20] A Compound Annual Growth Rate (CAGR) of 49%, against the 34% for China and 28% for the US.
[21] The State of Tech in Europe 2021.

Establishing the European Innovation Council (EIC), allows the most promising deep tech startups in Europe to gain additional support to scale-up their breakthrough innovations through a unique combination of public grant and patient equity investment through the EIC Fund. The Fund is set to become the largest early stage, deep tech investor in Europe: leveraging a budget of EUR 10 billion for the EIC to crowd in EUR 30 to 50 billion[22] from other private investors.

Measures under the capital markets union (CMU)[23] and support through InvestEU[24], the latter mobilising more than EUR 370 billion in additional investments, will further incentivise private investment to support such innovations in Europe. This includes efforts to leverage a fraction of the ca. EUR 13 trillion of "assets under management" (AUM)[25] of EU-based long-term institutional / private investors such as pension funds and insurance companies, into scale-up venture capital funds in the EU.

Nonetheless, the EU has a significantly lower number of tech scale-ups than the US and China, and scale-up financing lags behind that for startups[26]. A number of factors hold the EU back. Traditional bank products, such as loans, credit lines and bank overdrafts continue to be the main source of external finance for European enterprises[27]. Alternative market-based resources such as equity play a relatively minor role in the EU, and the tax system reinforces the status quo, as interest payments on debt financing are tax deductible, while in most Member States, the costs related to external equity financing are not[28].

The short-term character of traditional financing together with the comparative fiscal disadvantage of equity compared with debt is a significant constraint on innovation investments notably when scaling up. Deep tech innovation requires large amounts of patient capital as the companies concerned generally: lack established revenue streams and secured cash flow; are rich in intellectual property (IP) but have little tangible collateral; and will take time to deploy their results in terms of both marketable products and financial returns.

The EU also lacks large venture capital (VC) funds who are willing to subscribe large deal values when compared to those in the US and China. The distribution of VC investors across different investor types reveals that pension funds and insurance companies account for only 12.7% of the total VC funds raised in the EU in 2020[29]. Government agencies on the other hand, accounted for the largest share (almost 35%). This underscores the fragmented and risk averse nature of the European VC market, with many investors focusing on early stage, narrow, regional markets, which result in fewer and smaller late-stage investment rounds in Europe.

[22] https://eic.ec.europa.eu/system/files/2021-03/ec_rtd_eic-vision-roadmap-impact.pdf
[23] Capital markets union
[24] https://investeu.europa.eu/index_en
[25] EU-27 pension funds represent ca. EUR 3 trillion (OECD, global pension statistics, 2022) and EU-based insurance companies have ca. EUR 10 trillion of assets under management (AUM; Insurance Europe, data, 2021).
[26] Tackling the Scale-up Gap: Evidence and impact of the scale-up financing gap for innovative firms in Europe and reflections on potential solutions - Anita Quas, Colin Mason, Ramón Compañó, James Gavigan and Giuseppina Testa.
[27] European Commission (2017), Analysis of European Corporate Bonds Market. Analytical report supporting the main report from the Commission Expert Group on Corporate Bonds.
[28] DEBRA Inception impact assessment
[29] Science, Research and Innovation Performance of the EU 2022 (forthcoming) based on Invest Europe, 2021.

A majority of the larger investment rounds have been driven by overseas investors (non-EU based VC funds)[30], while Initial Public Offering (IPOs) also play a relatively minor role in financing in the EU when compared to the US. An undersized IPO market limits sources of equity funding for companies[31] and investment opportunities for investors. This also limits the exit routes for VC and private equity investors which may have invested at an earlier stage of development of the company. In 2020, only 5% of the total divestment amount took place through IPOs in the EU, against the 30% reported in the US[32]. There is evidence that in combination, these factors have pushed European companies towards relocation including through overseas listings and exits including trade sales[33].

Furthermore, women and those from diverse backgrounds remain underrepresented in both deep tech startups and in investment funds despite clear correlations between company growth and the presence of diverse teams[34], including women, in leadership positions. In 2020, technology companies with female-only founders captured just 1.7% of the capital raised in European VC markets[35], and the difference between male-led companies and those with mixed and/or female founders remained significant in terms of both capital raised and the number of deals. Evidence points to similar under representation with respect to other minority groups. This limits the flow of ideas and talents that cater to the needs of the EU's diverse population and opportunities in global markets.

2.1.2 Flagship on funding for deep tech scale-ups

This flagship focuses on measures that will accelerate the growth of deep-tech start-ups in the EU. Approximately EUR 45 billion of funding for scale-ups could be mobilised by 2025[36] from untapped sources of private capital, and the cost of listing on public markets could also be reduced.

Rebalancing debt-equity incentives

The Commission has proposed a **debt-equity bias reduction allowance (DEBRA) on corporate income tax**[37] that would increase the availability of equity and make it more attractive for companies by reducing the cost of new equity across the EU. Once adopted by the Council, this could provide an allowance on the cost of raising equity combined with a limitation of interest deductibility. All non-financial corporations would be eligible for an allowance on new

[30] 75% of the scale-up finance deals in the EU.
[31] IPOs allow scale-ups to access risk capital to an amount of capital 5.5 times superior to that raised by those that remain private (https://mindthebridge.com/tech-scaleup-ipos-2019-report/)
[32] Science, Research and Innovation Performance of the EU 2022 based on Ambrosio et al (2021).
[33] Braun et al. (2019), Follow the Money: How Venture Capital Facilitates Emigration of Firms and Entrepreneurs in Europe 2019.
[34] https://hbr.org/2018/07/the-other-diversity-dividend/
[35] Atomico (2021), State of European Tech 2021.
[36] EUR 30 billion from pension funds, EUR 15 billion from insurance companies. Staff Working Document accompanying the New European Innovation Agenda, 2.1.3. Funds that could be mobilised through the action on later stage venture capital financing.
[37] Published on 11 May 2022.

equity and small and medium-sized enterprises (SMEs) could receive a higher notional interest rate (i.e., benefit from higher deductions) compared to larger firms.

Listing

In line with the objectives of the Commission's 2020 capital markets union (CMU) Action Plan, the **Commission will propose a Listings Act** in the second half of 2022. The Listings Act will simplify and ease both initial and ongoing listing requirements for certain types of companies in order to reduce costs and increase legal certainty for issuers, while safeguarding investor protection and market integrity. To allow certain founders and families (e.g. issuers listing on SME growth markets) to retain control post-listing, while raising a larger amount of funds and enjoying the benefits associated to listing, the Listing Act may also propose a minimum harmonisation of national legal regimes relating to Dual Class Share structures across the EU. Further, thanks to an EU guarantee under the SME IPO initiative[38] of InvestEU, the European Investment Fund will invest in SMEs that are going public or intend to do so. This will attract additional private investments to support SME scale-up and growth.

Later stage venture capital financing

The InvestEU Guarantee Agreement signed by the European Commission and the EIB Group in March 2022 paves the way to implement the InvestEU financial products under the **Research, Innovation and Digitisation window** through which the EIB Group will deploy EUR 5.5 billion to support breakthrough innovations up to 2027[39]. Building on a successful pilot[40], the **European Scale-Up Action for Risk Capital (ESCALAR) mechanism will be expanded under InvestEU**. The expansion will attract more and new private funds and institutional investors in particular, by complementing VC equity with quasi-equity having a reduced risk profile. This has the potential to double a given VC fund's investment capacity without distorting the character of the European VC landscape by attracting additional private investment based on a non pari-passu approach[41].

In support of this, the Commission will convene leaders of large institutional investors (pension, insurance and sovereign wealth funds) to explore opportunities and requirements for increasing investments into VC funds. Efforts to help financial institutions and their investment experts better assess, value and valorise intangible assets to facilitate the use of IP as collateral by SMEs will also be explored under InvestEU.

Further, together with Member States and the EIB, the Commission will assess the complementarities between existing EU funding instruments and recent initiatives such as the European Tech Champions Initiative[42] (ETCI, to which the EIB Group will initially commit up to EUR 500 million), with a view to addressing the scale-up gap for European deep-tech companies.

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[38] https://www.eif.org/InvestEU/equity_products_calls/index.htm

[39] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1548

[40] https://www.eif.org/what_we_do/equity/escalar/index.htm

[41] Investments benefitting from certain additional protections that reduce investment risk compared to other share classes or similar. In recognition of the lower risk, the investment will not benefit from the same return entitlements as other investors subscribing other share classes or similar with higher risk.

[42] https://www.eif.org/what_we_do/equity/news/2022/eib-supports-the-pan-european-scale-up-initiative-to-promote-tech-champions.htm

Increasing Diversity and Improving Deal Flow

The Commission will **pilot an innovation gender and diversity index**. This will include data on women and other less represented groups, including individuals with disabilities, in innovative startups and scale-ups as well as amongst investors and funds investing in such companies. It will be informed by a study to assess the gender investment gap both at the level of female-led companies and female-led funds. The study will develop a harmonised methodology for robust and systematic data collection and suggest adequate data analytics, to better inform policy. Programmes such as the **EIT's Women2Invest**[43], will further support efforts to increase diversity by helping investors connect to, and recruit from a more diverse pool of talent.

2.2 Framework conditions for deep tech innovation

2.2.1. Challenges

Framework conditions including regulations can drive or thwart the development and uptake of innovative new products and processes.

The EU has taken steps to strengthen integration within the single market and adopt regulations that balance the need to protect with that to innovate, as evidenced by the Commission's better regulation guidelines and associated toolbox[44]. Experimentation clauses paving the way for a more dynamic evolution of regulations exist in the digital[45] sphere, and the European Blockchain Services Infrastructure (EBSI) funded by the Digital Europe programme is one such example providing a general-purpose pan-European platform for cross-border public services. The recent evaluation of the European Interoperability Framework[46] also found that establishing structured cooperation around the interoperability of digital public services could have a material impact on innovation in the public sector. The transport and energy sectors have also benefited from such approaches in some Member States.

More recently, the Commission's revised proposal on the Renewable Energy Directive[47] provided scope to create regulatory sandboxes to foster innovation in the renewable energy sector, and a recommendation on fast permitting the deployment of renewable energy projects was included as part of the REPowerEU Plan. The proposal for a revised Industrial Emissions Directive (IED)[48] also promotes the uptake of innovative technologies and techniques during the ongoing industrial transformation by among others providing for temporary derogations on emission limits to test emerging techniques or to implement a state-of the art technique. Further, living labs for green digital solutions and smart zero pollution under the Zero Pollution Action

[43] https://eit.europa.eu/our-activities/opportunities/eit-opens-call-investors-participate-women2invest
[44] Better regulation: guidelines and toolbox | European Commission (europa.eu) - see in particular the dedicated tool #22 on research and innovation and tool #69 on emerging policies such as regulatory sandboxes.
[45] https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0001.02/DOC_1&format=PDF
[46] https://ec.europa.eu/isa2/eif_en/
[47] https://ec.europa.eu/info/sites/default/files/amendment-renewable-energy-directive-2030-climate-target-with-annexes_en.pdf
[48] https://ec.europa.eu/environment/industry/stationary/ied/evaluation.htm

Plan[49] will support engagement with regional and local authorities alongside stakeholders to develop local actions for green and digital transition.

The nature of breakthrough deep tech innovations and the urgency of the twin transition however, call for more progress on responsible regulatory frameworks that facilitate experimentation by innovators, ensure public acceptance and enable learning and adaptation by regulators in new domains. There is also considerable scope to learn from distinct approaches taken forward across EU Member States to clarify options at the disposal of innovators and regulators, to facilitate such experimentation.

Further, leveraging the role of the public sector as a lead customer can shape markets, deliver improved and accessible services, crowd in private investment where it would otherwise be lacking, and importantly, provide innovative start-ups with a vital first customer. In the EU, public authorities spend around 14% of GDP (around EUR 2 trillion a year) on procuring products and services[50]. According to EU wide benchmarking[51], modernising public services and strengthening the EU's industrial competitiveness globally requires a doubling of investments in innovation procurement. To date, while 81% of OECD countries have developed national strategies with policies that foster innovation procurement, only a third of EU Member States have such strategies. Data that can help improve existing approaches is either missing or inconsistent, impeding informed decision-making.

2.2.2 Flagship on enabling deep tech innovation through experimentation spaces and public procurement

This flagship focuses on facilitating innovation through improved framework conditions including experimental approaches to regulation, through so-called regulatory sandboxes[52], as well as test beds, living labs and innovation procurement.

Regulatory sandboxes

The Commission will **issue a guidance document** in the first half of 2023 that will clarify relevant use cases of regulatory sandboxes, test beds and living labs in order to support policymakers and innovators in their approach to experimentation in the EU. A staff working document will provide an overview of the main existing experimentation clauses and regulatory sandboxes in EU law, and support will be provided for innovators to identify areas and establish an experimentation space, such as regulatory sandboxes, living labs or test beds, which could facilitate the deployment of disruptive technologies through future calls[53].

[49] Zero pollution action plan (europa.eu)

[50] European Council of the European Union (2020), Council Conclusions: Public Investment through Public Procurement: Sustainable Recovery and Reboosting of a Resilient EU Economy.

[51] See Commission notice on innovation procurement C(2018)3051, based on the Bell innovation curve for conservative sectors.

[52] Regulatory sandboxes provide well-defined exemptions to allow trials of innovative products and technologies that would otherwise not be fully compliant with existing regulations.

[53] https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/european-innovation-ecosystems_en

The Commission will also support the **creation of the GovTech Incubator** in 2023: an agreement for cross-border collaboration between digitalisation agencies for the deployment of innovative digital government solutions through Digital Europe programme.

In addition, the Commission will pilot an **Innovation-Friendly Regulations Advisory Group,** a group that provides upstream policy advice on new technologies in relation to the regulatory environment and business models, to focus on the use of advanced digital technologies within public services. This will include, in particular, the implementation of selected use cases in the public sector and interoperability requirements for digital solutions adopted by public administrations in the EU. Advice from the group may also support actions and programmes related to public procurement and experimentation with advanced emerging digital technologies by public authorities in controlled environments (regulatory sandboxes).

Test beds

The Commission will establish a new **open innovation test bed in renewable hydrogen** in 2023 under Horizon Europe to provide access to physical facilities, capabilities and services. As part of the open innovation test bed, the implementing parties will seek guidance on compliance with the European legal and regulatory frameworks and on increasing circularity by design (life cycle assessment), to support the development of a vibrant hydrogen economy across the entire value chain. Insights from the 22 open innovation test beds supporting the industrial uptake of technological innovations in the areas of nanotechnology and advanced materials will inform the future applicability of this approach. This will be complemented with advice from high-level groups such as a "New Mobility Tech Group" on facilitating testing and trials of emerging mobility technologies and solutions in the EU (European mobility test bed)[54].

Access to innovation infrastructure

The revised State Aid Framework for Research and Development and Innovation (RDI) will include, upon adoption, **a new rule allowing Member States to grant aid for the construction and upgrade of testing and experimentation infrastructures**. This will ensure that the RDI framework together with the General Block Exemption Regulation (GBER) can help Member States support the delivery of the European Green Deal[55] and the Commission's Industrial and Digital[56] strategies.

The Commission will also launch **testing and experimentation facilities**[57] **for AI innovation** at a European level in 2023. These will allow innovators to test state-of-the art solutions and products in real-world environments and at scale.

Innovation procurement

The Commission will support the formation of an **innovation procurement specialist advisory service**. This will act as an intermediary between public procurers and innovative suppliers. The Commission will also support the creation of living labs and incubators for example, to connect

[54] See Sustainable and Smart Mobility Strategy.
[55] A European Green Deal | European Commission (europa.eu)
[56] Europe's Digital Decade: digital targets for 2030 | European Commission (europa.eu)
[57] Digital Europe Programme

innovators and public administrators to provide innovative solutions in areas of public need[58]. Further, the Commission will update its EU wide benchmarking[59] of national policy frameworks and investments on innovation procurement in Europe and assess take up of the innovation partnership procedure within the procurement directive of 2014 alongside that on pre-commercial procurements, which fall outside of the procurement directives and international procurement agreements.

2.3. Promoting innovation ecosystems and tackling the innovation divide across the EU

2.3.1 Challenges

The EU's innovation performance continued to improve over the period 2014-2021[60]. It can compete effectively with leading economies across the globe by building a true pan-European innovation ecosystem underpinned by thriving regional innovation ecosystems and capitalising on the experience, needs, vision and perceptions of an increasingly diverse range of individuals, companies and places.

Smart specialisation strategies[61] play a central role in strengthening regional innovation ecosystems so that they are better equipped to stimulate and sustain economic growth. They provide the framework for European Regional Development Fund (ERDF) support for research and innovation to the tune of an estimated EUR 56 billion for the 2021-2027 period. Thematic Smart Specialisation Platforms and partnerships have also become key tools for connecting innovators with similar or complementary strengths and priorities in all Member States and regions, including in technology areas that are key for the twin green and digital transition. Over the last six years, 37 interregional partnerships[62] involving 180 territories from 33 EU and non-EU countries have provided such support in areas such as advanced battery materials, and hydrogen and fuel cell technology.

Research and technology infrastructures are also helping attract the best researchers, engineers, technicians, and students and have the capacity to underpin regional and regional innovation ecosystems. In regions across Europe, the alignment of support from the ERDF with smart specialisation strategies is fostering place-based innovation and stimulates investments aligned with regional business needs and opportunities. This has led to the creation of regional innovation hubs and industrial clusters based on the co-location of research infrastructures, HEIs, research and technology organisations, and industry (e.g., Grenoble, Hamburg or Brno). The

[58] The Single Market Programme | European Commission (europa.eu)

[59] European Commission, Directorate-General for Communications Networks, Content and Technology, The strategic use of public procurement for innovation in the digital economy: executive summary in English, French and German, Publications Office, 2021.

[60] European Innovation Scoreboard 2021.

[61] Smart specialisation strategies are the EU's principal methodology for reinforcing national and regional innovation eco-systems. Member States and regions across the EU are presently updating their smart specialisation strategies, in line with the established concept and relevant legal provisions for cohesion policy support.

[62] https://ec.europa.eu/growth/industry/strategy/interregional-partnerships_en#:~:text=Interregional%20partnerships%20The%20European%20Commission%20supports%20interregional%20partnerships,interregional%20cooperation%20to%20boost%20industrial%20competitiveness%20and%20innovation

European Cluster Collaboration Platform (ECCP)[63] provides both an overview of the specialisation and the impact of such clusters across 201 European regions, and EU programmes including the work of the Enterprise Europe Network (EEN) facilitate critical connections to international partners and supply chains reflecting the importance of openness and trade partnerships for the EU's economy[64]. The Commission has also launched the Common Mapping of Innovation Supporting Actors initiative[65] to provide a comprehensive mapping of innovation supporting actors and state of the art supporting facilities across all regional innovation ecosystems throughout Europe.

This work is in addition to funding for the European Institute of Innovation and Technology (EIT) and the European Innovation Ecosystems (EIE) under Horizon Europe's Pillar III "Innovative Europe", which is laying the groundwork for a pan-European Innovation Ecosystem intertwining regional innovation ecosystems across the EU. The EIT's Regional Innovation Scheme (RIS) focuses on developing innovation ecosystems in low-innovation performance regions across Europe and in linking these ecosystems to local and regional smart specialisation strategies. A new set of EIE projects will complement this by connecting well-developed regional innovation ecosystems with less developed ecosystems, ensuring cross-fertilisation.

Moreover, the Commission continues to encourage more coherence and greater synergies between EU policies and funding mechanisms supporting business innovation at all levels including by Member States under the New ERA Policy Agenda. This includes the industrial technology roadmaps that look to align research and innovation investments at EU and national levels to foster the development and uptake of innovative technologies[66] and the ERA hubs. The Recovery and Resilience Facility (RRF) will further underpin such developments. EUR 44 billion (at 2021 prices)[67] will be provided in the form of loans and grants to address country-specific challenges identified in the European Semester and promote the green and digital transition, which will contribute to system-wide resilience.

New models of collaboration have also been enabled, including through the Industrial Alliances[68] that bring together a wide range of partners in a given industry or value chain, including stakeholders from the public and private sector, and Important Projects of Common European Interest (IPCEI)[69], which enable the commercialisation of breakthrough innovations integrating the efforts of several EU Member States in support of the EU's industrial strategy in areas such as renewable and low carbon hydrogen and microelectronics. Furthermore, the network of European Digital Innovation Hubs will support digital innovation in SMEs and public administrations across all regions of the EU, by complementing national and regional digitalisation strategies, in order to help companies innovate and become more competitive using digital technologies.

[63] https://clustercollaboration.eu/
[64] https://trade.ec.europa.eu/doclib/docs/2021/february/tradoc_159438.pdf
[65] https://joinup.ec.europa.eu/collection/cmisa
[66] https://ec.europa.eu/info/research-and-innovation/research-area/industrial-research-and-innovation/era-common-industrial-technologies-roadmaps_en
[67] More than EUR 44 billion of the total will support research and innovation activities.
[68] Industrial alliances (europa.eu)
[69] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_6245

Despite these efforts, regional disparities in research and innovation performance remain deep across the EU and this innovation divide has been increasing. The diffusion of innovations and the uptake of breakthrough technologies including through inter-regional linkages remains sub-optimal and there is also unexploited potential in regional innovation ecosystems, often centred around higher education, research or training organisations. These can contribute[70] to industrial sectors and global value chains, but may currently lack incentives, experience and the resources to engage more actively especially in less developed regions.

This gap in innovation performance, mirrored by downturns in economic growth, connectivity and income, alongside rising inequality, weakens the performance of the EU innovation ecosystem as a whole and hinders cohesion across the EU.

2.3.2 Flagship on accelerating and strengthening innovation in European Innovation Ecosystems across the EU and addressing the innovation divide

This flagship aims to accelerate innovation and unlock excellence across the EU through various tools. It focuses on creating the basis for the emergence of connected regional innovation valleys across the EU, notably involving regions with a lower innovation performance, by building on strategic areas of regional strength and specialisation, in support of key EU priorities.

Fostering connected regional deep-tech innovation valleys across the EU

This action will look to strengthen innovation ecosystems across the EU, by accelerating the development and deployment of innovation, including deep tech innovation. It brings together less and more innovative regions with a view to addressing the most burning challenges facing the EU, namely reducing the reliance on fossil fuels, increasing global food security, mastering the digital transformation (including cybersecurity), improving healthcare and achieving circularity.

It will be launched by the end of 2023 and identify up to 100 regions committed to enhance the coordination and directionality of their R&I investment and policies, at regional level. It is expected that these regions will prioritise 3-4 **inter- regional innovation projects** including in deep tech innovation, linked to key EU priorities. It will build on **Smart Specialisation Strategies** and, where applicable, on the participation in the Partnerships for Regional Innovation (PRIs)[71], a pilot involving 74 EU territories (including 63 regions - NUTS2) that was launched by the European Commission and the European Committee of the Regions in April 2022.

In order to capitalise on such investments and maximise their impact, the Commission will support efforts to turn the diversity of the EU's territories into a strength by leveraging the specific assets of each region, and facilitating collaboration to build new EU value chains. This will enable regions with aligned areas of specialisation and complementary capabilities, as well as different levels of innovation performance, to collaborate and take forward joint innovation projects targeting EU priorities.

[70] As illustrated in the HESS handbook (JRC125293)
[71] https://s3platform.jrc.ec.europa.eu/pri

With funding of EUR 100 million from Horizon Europe and EUR 70 million from the Interregional Innovation Investments (I3) instrument under the ERDF, support will be provided for interregional collaboration activities that feature collaboration between at least one less innovative and another more innovative region. Supported actions could include market uptake of research, support companies in scaling up their ideas, as well as deploying and demonstrating deep technologies in real world environments and with end users, access to cross border infrastructure and expertise, exchange of staff, training and skills development and developing standards and regulations through sandboxes and test beds. Successful applicants under the joint Horizon and Interregional Innovation Investment Instrument (I3) calls will also be recognised as a **"regional innovation valley"**.

It is expected that regional innovation valleys will tap into the support available through their national and regional ERDF programmes to maximise their contribution to, and benefit from, engagement in interregional activities. It is estimated that at least EUR 10 billion available to Member States under Smart Specialisation Strategies will be directed to regional innovation, including in deep-tech innovation, linked to EU priorities.

This action will take account of existing efforts aimed at reinforcing and connecting industrial and regional innovation ecosystems. This includes I3 under Cohesion Policy; Startup Villages[72] as part of the Long term Vision for Rural Areas policy[73]; Euroclusters[74] under the Single Market Programme; and Horizon Europe including European Innovation Ecosystems, Startup Europe, Widening Participation and Strengthening the European Research Area, Missions, and the work of the EIT's Knowledge and Innovation Communities (KICs) and RIS.

Synergies between cohesion policy programmes and Horizon Europe

To achieve the ambition of building greater synergies between cohesion policy and Horizon Europe during the course of the 2021-2027 programming period, the Commission will publish a **guidance document**[75] outlining complementarities between the respective funding instruments. This will support managing authorities of the cohesion policy programmes, National Contact Points for Horizon Europe and project promoters in making better use of opportunities to foster innovation in all regions, through the integrated use of these key EU instruments to facilitate the deployment and uptake of advanced technologies funded through research and innovation programmes, and thereby increase their impact. Such synergies will also be sought elsewhere including through the EU ETS Innovation Fund[76], which will support the demonstration of innovative low-carbon technologies and support the transition to climate neutrality.

Domain specific ecosystems

As part of the REPowerEU Plan, the European Commission has committed to boosting breakthrough innovation in renewable and low carbon hydrogen, a key technology for breaking

[72] https://s3platform.jrc.ec.europa.eu/en/w/the-european-startup-village-forum-call-for-pledges

[73] https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy/long-term-vision-rural-areas_en#documents

[74] https://clustercollaboration.eu/tags/joint-cluster-initiatives#:~:text=To%20implement%20the%E2%80%AFupdated%20EU%20Industrial%20Strategy%2C%20the%20European,the%20transition%20to%20a%20green%20and%20digital%20economy

[75] Commission notice of synergies between Horizon Europe and ERDF programmes (2022)

[76] Innovation Fund (europa.eu)

the reliance on fossil fuels. Drawing on a EUR 200 million top-up from Horizon Europe, the number of **Hydrogen Valleys** in the EU will, starting in the fourth quarter of 2022, be doubled to reach 50 by 2025. These will cover several hydrogen applications and combine into an integrated regional ecosystem covering the entire value chain, aligned to regional requirements. The existing hydrogen valleys established in the EU will also be connected with one another to accelerate the rollout of the hydrogen economy in the EU, with funding under the Connecting Europe Facility.

Further, through the proposed **EU Chips Act**, action will be taken to bolster Europe's competitiveness and resilience in semiconductor technologies and applications. This will help support the twin digital and green transition and strengthen Europe's technological leadership, and therefore ambitions for open strategic autonomy in the field. Investments in the next generation of technologies will include support for Europe wide access to design tools and pilot lines for prototyping, testing and experimentation. In total, more than EUR 43 billion of investment will support the policy ambitions of the Chips Act in the period up to 2030, which will be broadly matched by long-term private investment.

Important Projects of Common European Interest

The Commission will continue to actively support Member States collaboration in taking forward cross-border **Important Projects of Common European Interest** (IPCEI) under the State Aid Framework, to enable investment at scale in support of breakthrough innovations in key sectors and overcome market failures across the EU, including in less developed regions.

To date, two IPCEIs in the battery value chain have enabled significant investment in research and innovation as well as in support of the first industrial deployments of new battery technologies[77]. Over EUR 6 billion of Member States' funding will unlock an additional EUR 14 billion in private investments. A second IPCEI in microelectronics[78] will also be taken forward building on the success of the first[79], and the Commission will actively support ongoing efforts by Member States in the design of IPCEIs in the areas of health, cloud infrastructure and services, and hydrogen technologies and systems, with a view to completing the assessment of the first IPCEI on renewable and low carbon hydrogen by summer 2022. Further, as part of the RePowerEU Plan, the Commission will support efforts by the Member States to pool resources focused on breakthrough technologies and innovation along the solar and wind energy and heat pumps value chains.

Innospace

The Commission will establish **'Innospace'**, an AI-based open platform, to support the circulation of ideas and access to research results, highlight the demand and supply of innovative solutions, and connect stakeholders to facilitate collaboration. It will provide all stakeholders with information on innovation challenges and opportunities (technology and market trends, intellectual property, demand, etc.) and facilitate the identification of functionalities, services and funding opportunities, public or private, to support the translation of ideas into activities and projects.

[77] IPCEI Batteries (ipcei-batteries.eu)
[78] IPCEI on microelectronics – A major step for a more resilient EU chips supply chain | European Commission (europa.eu)
[79] https://www.ipcei-me.eu/

Further, a new '**EIC ScaleUp 100' action**[80] will identify a cohort of a hundred deep tech start-ups with the potential to scale up as global leaders or potential unicorns[81] from the portfolio of the EIC as well as other EU programmes. By mid-2023 these companies will start receiving enhanced support to develop their strategy and leadership team, protect IP, connect to strategic investors and partners, expand internationally and obtain links to national scale up support. Besides direct support to companies, the initiative will also share best practice amongst Member States and across Europe-wide networks

2.4 Deep tech talents

2.4.1 Challenges

Innovation depends on the successful nurture, attraction and retention of talented individuals and a diverse array of skills. High quality education and attractive working conditions are thus key to attracting and ensuring a flow of highly skilled and talented individuals that can contribute to achieving wider policy priorities including the twin transition and a competitive edge in strategic value chains.

To date, the Bologna[82] and Lisbon[83] processes have played a key role in improving European competitiveness in higher education, boosting both cooperation and mobility within Europe and in incentivising global talent to move to Europe. Proposals under ERA, European Education Area (EEA), the Skills Agenda[84], the European strategy for universities, and the Skills and Talent package[85] alongside EU programmes such as European Social Fund Plus, Marie Skłodowska Curie Actions (MSCA), Erasmus+ and Erasmus for Young Entrepreneurs also play a significant role in developing, attracting and retaining skills.

The new European strategy for universities features measures to turn HEIs into engines of regional innovation, including through a talent fair to match students and startups, a programme to support the creation of incubators in European HEIs, and a new 'innovators at school' initiative. Likewise, in recognition of the importance of vocation education and training, the centres of vocational excellence (CoVE)[86] provide high quality support for innovation across the EU and within regions including through services such as clusters and business incubators for startups alongside entrepreneurial initiatives for participants.

The EIT has created the largest network of innovation partners with 2900 partners with a particular focus on education courses that combine technical and entrepreneurship skills, as well as startup creation and acceleration services with the provision of equity investment for startups. he Structured Dialogue on digital education and skills launched in October 2021, following President von der Leyen State of the Union address, will also support Member States in their

[80] EIC Work Programme 2022 – p. 113.
[81] A company with a valuation of over EUR 1 billion.
[82] http://www.ehea.info/
[83] https://www.coe.int/en/web/higher-education-and-research/lisbon-recognition-convention
[84] European Skills Agenda - Employment, Social Affairs & Inclusion - European Commission (europa.eu)
[85] Skills and Talent | European Commission (europa.eu)
[86] https://ec.europa.eu/social/main.jsp?catId=1501

efforts to attain the Digital Decade target for skills. It will contribute identifying existing gaps at national level and promote successful approaches to improve digital skills and related training.

Furthermore, several Member States have also now launched 'startup visas' and in 2021, 26 countries (24 EU Member States alongside Iceland) signed the Declaration on the EU Start-up Nations Standard[87], which promotes policies that will favour startups, and facilitate access to talent, including international talent.

Nonetheless, the EU appears to be losing the global race for talent[88]. Skilled researchers and potential academics have moved from the EU to the US, and the EU has been less successful than other OECD countries such as the US, Canada and Australia in attracting global talent at earlier career stages including at PhD level. Access to talents is also hampered by structural barriers and persisting biases, resulting in a lack of diversity in particular STEM fields: women represent 22.4% among doctoral graduates in the field of ICT and 29.4% in the field of Engineering Manufacturing and Construction.

In parallel, the EU's working age population is shrinking due to demographic change, and foreseeable changes to the labour market point to the likelihood of growing skills mismatches and future shortages. There is for example a relatively high share of professionals with skills in advanced manufacturing technologies and industrial biotechnology in the EU27, but a noticeable gap when compared to the US in AI and cybersecurity[89].

High concentrations of talents within EU Member States will accentuate these shortages. The HEInnovate country reports[90] show that the most innovative and entrepreneurial HEIs are concentrated in the main cities with a resultant disparity between the needs of the economy and the availability of talent. Regions with the potential to develop technologies critical to the green transition such as renewables are often distant from those with transitioning industries such as coal mining[91].

University-industry collaboration alongside that with research and technology infrastructures is a crucial channel for the production, valorisation and diffusion of new knowledge. Evidence however points to mixed uptake in support of inter-sectoral mobility despite increased recognition of its value. Higher education, research and technology infrastructures and training institutions, in less innovative regions in particular, currently lack the incentives, experience and resources necessary to engage more effectively with regional and international partners in industry. Entrepreneurial networks and training, essential for building capacity and experience in identifying opportunities, and commercialising innovative propositions are also not equally accessible, and the EU's innovation ecosystem fails to reflect the rich diversity of its population.

[87] https://startupnationsstandard.eu/
[88] Khan, J. (2021). European academic brain drain: A meta- synthesis. European Journal of Education, 56(2), 265-278;
[89] Advanced Technologies for Industry – Final Report, report on technology trends and technology adoption, July 2021
[90] HeInnovate: Encouraging entrepreneurship through higher education – OECD
[91] https://joint-research-centre.ec.europa.eu/jrc-news/eu-coal-peat-and-oil-shale-regions-updated-analysis-challenges-ahead-2021-03-16_en

Further, despite an effective stock options[92] regime for startups to attract talent proving its value, levels of employee ownership remains low across the EU[93]. The absence of innovation friendly employee ownership regimes hampers the ability of EU startups to compete for talent with Big Tech companies.

2.4.2 Flagship on fostering, attracting and retaining deep tech talents

Given the sizeable challenge to attract and retain talents in the EU, this flagship focuses on enhancing EU efforts through activities that will ensure the development and flow of essential deep tech talent within and to the EU.

Deep tech talents

The EIT will take forward an initiative to target **1 million deep tech talents** over a 3-year period across all Member States. The EIT will update and scale up its talent and skills development programmes based on the needs of deep tech fields ranging from new materials and synthetic biology to cleantech. Scale-up companies alongside other industry representatives will inform curricula and ensure that they accommodate changing labour market needs in respective technology areas.

The EIC and the EIT will also launch an **innovation intern scheme** in the third quarter of 2023, to create opportunities for over 600 researchers and EIT labeled students and graduates to gain an innovation experience by 2024. The interns will gain work experience in successful EIC and EIT supported companies, with researcher and associated company needs informing individual internships.

The Commission will also provide additional training support to HEIs, including European Universities Alliances, businesses and research and innovation centres through the Digital Europe programme. This will include the training of specialists in fields such as data science, AI, cybersecurity and quantum to support the future deployment of such technologies across all economic sectors.

Furthermore, the Commission, in partnership with interested Member States and stakeholders, will design an EU Talent Pool for launch by mid-2023[94]. It will be an EU-wide platform, a matching tool to help European businesses, including startups, to find the talents that they are not able to find in the EU labour market. This will increase the mobility of skilled individuals towards and within Europe through international recruitment and by supporting matchmaking between EU-based employers and qualified nationals of non-EU countries wishing to work and move legally to the EU. The Students and Researchers Directive[95] and the revised EU Blue Card Directive[96], the latter to be transposed by 18 November 2023, will also offer legal pathways to

[92] Estonia, Latvia, Lithuania, France, Portugal, Italy, Poland, Sweden and Ireland have already implemented policies to promote the use of stock options also for startups. (source: Rewarding Talent - A guide to stock options for European entrepreneurs, Index Venture 2021)

[93] In 2016, it was approximately half of that in the US. Despite increases since, it remains relatively low.

[94] Part of the policy package on "Skills and Talent" adopted by the Commission in April 2022.

[95] Directive (EU) 2016/801.

[96] Directive (EU) 2021/1883, with deadline for transposition on 18/11/2023, repealing Council Directive 2009/50/EC.

attract high-skilled workers, researchers and students from non-EU countries and facilitate their mobility within the EU. Further, in keeping with the Skills and Talent proposal, the Commission will relaunch discussions with Member States and other relevant stakeholders to assess the scope for further EU level action targeting the admission of entrepreneurs and startup founders from third countries.

Stock options

The Commission will establish a **working group on stock options under the EIC Forum** to explore approaches to tackle the administrative barriers that currently limit the uptake of employees' stock options across the EU. The forum will in the first instance allow the Commission and Member States to exchange information and share best practice with a view to facilitating a coordinated approach across the EU.

Women leading deep-tech innovation

A **women entrepreneurship and leadership scheme** will support early-stage women-led tech startups including through an enhanced 'WomenTech EU' call[97]. This will feed into other EU initiatives such as 'Women4Cyber'[98], and potentially national, acceleration programmes, to speed up the growth of women-led companies. Collaboration between the EIC and EIT to support female entrepreneurs will be reinforced, by opening the EIC's Women Leadership Programme to women-led deep-tech startups from the EIT. Complementary activities will include opportunities to network and connect female beneficiaries from a range of initiatives; equipping girls and women with entrepreneurship and digital competencies through targeted actions like Entrepreneurship, Science, Technology, Engineering, Arts and Mathematics (ESTEAM) Fests alongside mentor, training and support schemes[99]; and support for the creation and development of social start-ups led by women by making the best use of actions included in the European social economy action plan[100].

Promoting an Entrepreneurial and Innovation Culture

The Commission will establish a **peer learning and review for innovative policy and practice community.** In cooperation with the OECD, it will gather HEIs, including the new European network of innovative HEIs, public officials and key stakeholders to spur the adoption of policies and practices that strengthen HEIs' contribution to innovation in the communities they serve. An annual Education and Innovation Summit will reinforce such efforts by bringing together HEIs, deep tech companies and entrepreneurs to foster cooperation and inspire the wider education, research and innovation community to promote an entrepreneurial and innovation culture in Europe.

[97] https://eic.ec.europa.eu/news/eu-launches-women-techeu-pilot-put-women-forefront-deep-tech-2021-07-13_en
[98] Commission launches Women4Cyber, a registry of talents in the field of cybersecurity | Shaping Europe's digital future (europa.eu)
[99] Organised in 19 EU Member States to boost women and girls' competences including through ESTEAM online communities allowing learning and connecting with their peers online.
[100] Social Economy Action Plan - Employment, Social Affairs & Inclusion - European Commission (europa.eu)

The Commission will also continue to support young entrepreneurs through the **EIT "girls go circular project"**[101] , and extend it to cover participants from all EU Member States equipping over 40 000 school girls with digital and entrepreneurial skills.

Furthermore, from 2023, the **Erasmus+ Alliances for Innovation**[102] **will support the development of entrepreneurial skills with a particular focus on deep tech skills**. This will support and complement the development of incubators within HEIs, in close cooperation with the entrepreneurial sector, to help student entrepreneurs turn their ideas into businesses, as announced in the European strategy for universities.

The Commission will also support the creation of communities of expert facilitators, including the European Universities Alliances, to increase collaboration between industry, academia and research organisations, and to help match the supply of knowledge with the requirements of industry for innovation

2.5. Improving the innovation policy-making framework

2.5.1 Challenges

Impactful innovation policies must be based on accurate monitoring and evaluation. Policies at both EU and national level must keep pace with the changing nature of innovation.

At present, the innovation policy-making landscape is varied with multiple definitions in relation to key terminology and often policy related data that is difficult to compare. This makes it difficult for decision makers at EU and national level to have a commonly shared view of the state of play of innovation and of the different components and trends of innovation in the EU. This flagship aims to tackle these policy framing challenges, as well as to enhance capacity support for Member States in need to improve their policy-making approach.

2.5.2 Flagship on improving policy making tools

This flagship focuses on the development and use of robust, comparable data sets and a common data taxonomy that can inform policies at all levels across the EU, and policy support for Member States.

Data informed policy

The Commission will **prepare an exploratory report on definitions related to startups, scale-ups and deep tech innovation** during the first quarter of 2023. A subsequent pilot study will establish a set of indicators on startups, scale-ups and deep tech innovation that can help analyse and model innovation ecosystem policies at regional, national and European level. The European Innovation Scoreboard will be updated accordingly.

[101] Girls Go Circular | Digital and Entrepreneurial Skills for the Circular Economy (eit-girlsgocircular.eu)

[102] The Erasmus+ Innovation Alliances foster Europe's innovation capacity through cooperation and flow of knowledge among higher education, vocational education and training (both initial and continuous), and the broader socio-economic environment.

Support for Member States

The Commission will **support Member States and regions in designing and implementing better innovation policies through the Technical Support Instrument** (TSI) as part of Next Generation EU[103]. This will provide essential support that can for example cover data gathering for informed policy making, capacity building for public procurement personnel, the provision of regulatory advice and the use of regulatory sandboxes.

The Commission will also reinforce its Horizon policy support facility to provide practical support to design, implement and evaluate reforms that enhance the quality of research and innovation investments, policies and systems in Member States.

Coordinating policy

The Commission will **strengthen the role of the European Innovation Council Forum[104]** in 2022, enhancing the exchange of best practices and coordination of national innovation policy initiatives. The policy orientations of the Forum will be consistent with the Pact for Research and Innovation[105], and will feed into the work of the ERA governance and the European Research Area and Innovation Committee, in its role as a high-level strategic policy joint advisory committee, providing early advice to the Council, the Commission and the Member States on strategic research and innovation policy issues.

3. CONCLUSIONS

Europe can be a global leader in the current wave of deep tech innovation by making a concerted effort that leverages its diverse talents, intellectual assets and industrial capabilities. Member States and regions in particular are encouraged to build on the proposals and work with the Commission and stakeholders to mobilise investments, ensure favourable framework conditions and implement essential reforms.

The Commission will monitor and report on the progress and impact of the actions identified in this Communication by 2024, in close cooperation with the representatives of Member States in the European Innovation Council Forum.

[103] https://europa.eu/next-generation-eu/index_en

[104] https://ec.europa.eu/research-and-innovation/en/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/building-european-innovation-ecosystem/eic-forum

[105] Proposal for a Council Recommendation on a Pact for Research and Innovation in Europe (2021)

List of Actions in the Communication

Title (Flagship – Actions)	Timeframe
Flagship: Funding for deep tech scale-ups	
1. Directive on debt-equity bias reduction allowance (DEBRA) on corporate income tax, Commission proposal	Q2 2022
2. Listings Act, Commission proposal	Q4 2022
3. Expansion of the European Scale-Up Action for Risk Capital (ESCALAR) mechanism	2023
4. EIC WP 2022 Pilot European innovation gender and diversity index	Q1 2023
5. EIT Women2Invest Programme	Q4 2022
Flagship: Enabling deep tech innovation through experimentation spaces and public procurement	
6. Guidance document on Regulatory Sandboxes	Q2 2023
7. Open innovation test bed in renewable Hydrogen	Q1 2024
8. Launch Testing and Experimentation Facilities for testing AI innovation	2023
9. Revised State Aid Framework for Research and Development and Innovation	Q4 2022
10. Launch Innovation Procurement Specialist Advisory Service	Q1 2024
Flagship: Accelerating and strengthening innovation in European Innovation Ecosystems across the EU and addressing the innovation divide	
11. Establish and connect regional deep tech innovation valleys	Q3 2023
12. Commission notice of synergies between Horizon Europe and European Regional Development Fund programme	Q3 2022
13. Double the number of Hydrogen Valleys in the EU	2025
14. Establish Innospace – one stop shop for innovation ecosystems' players	2023
15. Launch Scaleup 100	Q1 2023
Flagship: Fostering, attracting and retaining deep tech talents	
16. Launch EIT deep tech talent initiative	Q4 2022
17. Launch innovation intern scheme	Q3 2023
18. Launch an EU Talent Pool to help businesses, including startups, find non-EU talents	Q3 2023
19. Establish Women Entrepreneurship and Leadership scheme	Q2 2023
20. Best practice exchange on startup employees' stock options	Q4 2022
21. Education and Innovation practice community	Q4 2022
22. Launch Erasmus+ Alliances for Innovation	Q2 2023
23. Launch Digital Europe call to train experts in future-oriented fields	Q3 2022
Flagship: Improving policy making tools	
24. Report on definitions related to startups, scale-ups and deep tech innovation	Q1 2023
25. Strengthen the role of the European Innovation Council Forum	Q4 2022