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EVALUATION

Interim Evaluation of the Horizon Europe Framework Programme for Research and Innovation (2021 - 2024)

Accompanying the document

Communication from the Commission to the European Parliament and the Council

Horizon Europe: Research and Innovation at the heart of competitiveness

{COM(2025) 189 final}

Contents

Annexes:

List of Figures

List of Tables

Abbreviations

AYA	Adolescent and young adult (cancer patients)
CDI	Citation distribution index
CEF	Connecting Europe Facility
CPS	Call Passport System
CSA	Coordination and support action
DEP	Digital Europe programme
DG	Directorate-General
ECA	European Court of Auditors
EESC	European Economic and Social Committee
EFSI	European Fund for Strategic Investments
EIC	European Innovation Council
EIT	European Institute of Innovation and Technology
EMPIR	European Metrology Programme for Innovation and Research
ERA	European Research Area
ERC	European Research Council
ESIF	European Structural and Investment Funds
ERDF	European Regional Development Fund
EU	European Union
FP	Framework programme
FTE	Full-time equivalent
GDP	Gross domestic product
IA	Innovation actions
IF	Individual fellowships
IKAA	In-kind contributions to additional activities
IKOP	In-kind contribution to operational activities
INFRA	Research infrastructures
IOI	EU innovation output indicator
IPR	Intellectual property rights
JRC	Joint Research Centre
JU	Joint undertaking

KIC	Knowledge and Innovation Communities
MAA	Multi-actor approach
MSCA	Marie Skłodowska-Curie actions
NEIA	New European Innovation Agenda
PRC	Private for-profit entities (excluding higher or secondary education bodies)
RIA	Research and innovation actions
RIV	Regional Innovation Valleys
R&I	Research and innovation
RI	Research infrastructure
SDG	Sustainable Development Goals
SME	Small and medium-sized enterprises
SoE	Seal of excellence
SWD	Staff working document
SEWP	Spreading excellence and widening participation
SSH	Social sciences and humanities
TFEU	Treaty on the Functioning of the European Union
TRL	Technology readiness levels
VC	Venture capital
UN	United Nations

Glossary

Term	*Meaning or definition*
Administrative data	Data collected by government entities and agencies in the course of their regular activities for administrative purposes, such as to keep track of project payments.
Applicant	Legal entity submitting an application for a call for proposals.
Application	The involvement of a legal entity in a proposal. A single applicant can make several applications in different proposals. A single proposal can include several organisations and, therefore, several applications.
Art. 185 initiatives	Article 185 of the TFEU allows the integration of national efforts into a programme undertaken jointly by several Member States, with the participation of the EU, including participation in the structures created for carrying out the joint programme. In Horizon Europe, this includes the European Metrology Programme for Innovation and Research.
Associated countries	Association is the closest form of international cooperation. Entities from associated countries can participate under similar conditions as those from EU countries. A country becomes associated to Horizon Europe through an international agreement. 19 countries are associated to Horizon Europe[1] (those not previously associated under Horizon 2020 are marked in bold): Albania, Armenia, Bosnia and Herzegovina, **Canada**, Faroe Islands, Georgia, Iceland, Israel, **Kosovo**[*], Moldova, Montenegro, **New Zealand**[2], North Macedonia, Norway, Serbia, Tunisia, Türkiye, Ukraine, United Kingdom[3].
Background and foreground IPR	Background IPR applications that are inputs of research rather than outputs, i.e. for which no causal link can be established with the support received by the programme (e.g. IPR applications reported by participants but filed before the start of a project. Foreground IPR are those filed after the start of the project that are genuine outputs of project research.
Causality	The sufficient link from one factor or event (the cause) to another factor or event (the effect).
Citation distribution index (CDI)	The citation distribution index is the sum of the weighted share of each decile of a distribution of publications, ranked by citation count (i.e. the first decile includes the 10% least-cited publications, the 10th decile includes the 10% most cited publications). This indicator is also normalised by year and by subfield of science. The CDI is normalised to 0 (i.e., the world average). A score above 0 indicates an above average level of performance, while a score below 0 indicates the opposite.
Cluster	To maximise impact, flexibility and synergies, the Horizon Europe Regulation organises R&I activities in six clusters, interconnected through pan-European research infrastructures, which individually and together incentivise interdisciplinary, cross-sectoral, cross-policy, cross-border and international cooperation (Annex 1 to the Regulation). Clusters make up Horizon Europe's second Pillar, 'Global Challenges and European Industrial Competitiveness'. They serve to structure expected impacts which have been defined based on existing strategic documents that are developed together with external stakeholders. Input from these is translated in research topics in a process of co-design (with external stakeholders and the public) and co-creation

[1] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf

[*] This designation does not affect positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

[2] Associated to Pillar II 'Global Challenges and European Industrial Competitiveness' as from the work programmes, including for the institutionalised European partnerships.

[3] Associated to the entire programme, with the only exception of the EIC Fund, for award procedures implementing the EU budget from 2024 onwards.

	(among Commission services). The six clusters are: health; culture, creativity and inclusive society; civil security for society; digital, industry and space; climate, energy and mobility; food, bioeconomy, natural resources, agriculture and environment.
Co-funded partnerships	In Horizon Europe, co-funded partnerships involve EU countries, with research funders and other public authorities at the core of the consortium. This evaluation covers nine such partnerships: 1. Water4all: Water security for the planet 2. Clean Energy Transition 3. Driving urban transitions to a sustainable future (DUT) 4. A climate neutral, sustainable and productive Blue Economy 5. European Partnership on Transforming Health and Care Systems 6. ERA for Health 7. European Biodiversity Partnership (Biodiversa+) 8. European Partnership on the Assessment of Risks from Chemicals (PARC) 9. Innovative SMEs. State-of-play (implementation) statistics also include data on other, more recent co-funded partnerships, namely: accelerating farming systems transition – agroecology living labs and research infrastructures; animal health and welfare; personalised medicine; and sustainable food systems for people, planet and climate.
Co-funding rate	Ratio (expressed as a percentage) between the partners' contribution to a project (see "co-investment") and the total eligible costs of that project. It is the opposite of the funding rate. It differs from the leverage factor, as the denominator is the total project costs, not the EU contribution to the project.
Cohesion policy funds	Financing provided under Cohesion Policy funds from, e.g. the European Regional Development Fund (ERDF), European Social Fund Plus (ESF+) and the Cohesion Fund in the 2021-2027 period (previously referred to as the European Structural and Investment Funds, ESIF, in the 2014-2020 period). In the current financial framework, the European Agricultural Fund for Rural Development (EAFRD) is not part of the Common Provision Regulation (2021/1060) but part of Common Agricultural Policy regulation (2021/2115). The scope of Common Provision Regulation has thus changed.
Co-investment (or "direct call leverage")	At the level of R&I projects, the difference between the project's total eligible costs and the EU contribution to the project. This is equal to Key Impact Pathway #9, short-term indicator ("Co-investment").
Contractual public-private partnership (cPPP) under Horizon 2020	These are structured public-private partnerships that have direct input into the preparation of work programmes in areas of major industrial significance. They develop roadmaps for R&I activities. There are currently eight partnerships: Factories of the future; Energy-efficient buildings; Green vehicles; Future internet; Sustainable process industry; Robotics; Photonics; and High-performance computing.
Control group	A group that is suitable for comparison with the group of units that were subject to a given policy. For more information, see Annex 2.
Coordination and support action (CSA)	An action consisting primarily of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructures. This may also include complementary networking and coordination activities between programmes in different countries.
Co-programmed partnerships	In Horizon Europe, co-programmed partnerships are concluded between the Commission and mostly private (and sometimes public) partners. The evaluation covers 11 such partnerships: 1. Artificial Intelligence, Data and Robotics

	2. Made in Europe 3. Photonics Europe 4. Processes4planet 5. Batteries: towards a competitive European industrial battery value chain 6. Clean steel – Low-carbon steelmaking 7. Towards zero-emission road transport (2ZERO) 8. People-centric Sustainable Built Environment (Built4People) 9. Zero-emission waterborne transport 10. Connected and Automated Mobility (CCAM) 11. European Open Science Cloud (EOSC) Association
CORDA (and eCORDA)	CORDA stands for Common Research Datawarehouse. It is the internal repository of R&I data gathered from EU R&I framework programmes. eCORDA stands for External COmmon Research Datawarehouse. It contains data on projects and proposals.
Correlation	Association between two variables. The establishment of a reasonable correlation between variables does not imply the establishment of a causal effect.
Counterfactual impact evaluation (CIE)	Refers to statistical procedures to assess the effect of a policy measure and gauge the degree to which it attained its intended consequences. For more information, see Annex 2.
Differences in differences (DiD)	A counterfactual impact evaluation (CIE) method. For more information, see Annex 2.
Direct leverage	Difference between a project's total costs and the EU contribution.
Dissemination action	The public disclosure of the results by any appropriate means (other than resulting from protecting or exploiting the results), including by scientific publications in any medium.
European Partnerships	European Partnerships bring the European Commission and private and/or public partners together to address some of Europe's most pressing challenges through concerted R&I initiatives. They are a key implementation tool of Horizon Europe. There are three types: • institutionalised partnerships in the field of R&I between the EU, EU Member States and/or industry (including joint undertakings, Art. 185 partnerships and the EIT Knowledge and Innovation Communities – described and listed as separate items in this glossary); • co-programmed partnerships between the Commission and mostly private (and sometimes public) partners; • co-funded partnerships involving EU countries, with research funders and other public authorities at the core of the consortium.
European Research Council (ERC)	The European Research Council is a European funding organisation for excellent frontier research which offers various grant schemes such as: starting grants, consolidator grants, advanced grants, synergy grants and proof of concept. The ERC is led by an independent governing body, the Scientific Council.
European Structural and Investment Funds (ESIF)	ESIF covers the 2014-2020 programming period. It includes the following funds: - European Regional Development Fund (ERDF) - European Social Fund (ESF) - Cohesion Fund (CF) - European Agricultural Fund for Rural Development (EAFRD) - European Maritime and Fisheries Fund (EMFF). The relevant legislation for these funds was the Common Provision Regulation (1303/2013).

Evaluation criteria	According to better regulation guidelines and toolbox, the five evaluation criteria assess the extent to which an intervention is: 1) *effective* in fulfilling expectations and meeting its objectives; 2) *efficient* in terms of cost-effectiveness and proportionality of actual costs to benefits; 3) *relevant* to current and emerging needs; 4) *coherent* internally and externally with other EU interventions or international agreements; and 5) has *EU added value* - i.e. produces results beyond what would have been achieved by Member States acting alone.
Exploitation action	Using results in further research activities other than those covered by the action concerned, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardisation activities.
Financial instruments	Equity or quasi-equity investments, loans, guarantees and other risk-sharing instruments. Horizon 2020's financial instruments operated in conjunction with those of COSME. Strong synergies were to be ensured with the European Fund for Strategic Investments (EFSI) to create the maximum possible impact. This was the main form of funding for activities close to market under Horizon 2020.
Fast track to innovation (FTI) actions	A type of action under Horizon 2020 that funded any kind of project on close-to-market innovation activities.
Focus areas in Horizon 2020	Horizon 2020 set out four focus areas to stimulate the development of knowledge and technologies deemed crucial to tackling societal challenges. These were: • boosting the effectiveness of the Security Union (predominantly funding projects on vulnerabilities and threats related to European cybersecurity, migration and (financial) technologies); • connecting economic and environmental gains - the circular economy (predominantly funding projects on technological innovations in industrial processes and the reuse of resources to reduce waste and CO_2 emissions); • digitising and transforming European industry and services (predominantly funding projects concerned with automation, artificial intelligence and machine learning, as well as Earth observation); • building a low-carbon, climate-resilient future (predominantly funding projects on energy production and consumption, emphasising the economic and environmental aspects of electricity storage, distribution and use).
Funding rate	Ratio (expressed as a percentage) of the EU contribution to a project and project's total eligible costs.
GDP multiplier	The GDP multiplier is obtained by dividing the cumulative change in GDP by the magnitude of the policy stimulus and can be understood as the amount of GDP produced for each euro invested in the policy. It represents the economic effect of the policy, and does not account for other direct and indirect costs.
High-quality proposal	A proposal that scores above the threshold established for the action. Depending on the action, admissible and eligible proposals are evaluated and ranked against the award criteria (excellence, impact, quality and efficiency of the implementation). Award criteria and their thresholds are specified in the general annexes[4] to the Horizon Europe work programme.
In-kind contributions to additional activities (IKAA)	Private members of some joint undertakings (JU) had to provide a minimum amount of in-kind contributions for costs incurred for 'additional activities' outside the JU's work programme and budget, but falling within the scope of the JU's general objectives. In Horizon Europe, the JUs' Single Basic Act (Art. 2) defines them as 'contributions by the private members, constituent entities or the affiliated entities of either, and by

[4] Horizon Europe work programme 2023-2025, general annexes, pp. 23-26, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-13-general-annexes_horizon-2023-2024_en.pdf

	international organisations, consisting of the costs incurred by them in implementing additional activities less any contribution to those costs from the Union and from the participating states of that joint undertaking'.
In-kind contribution to operational activities (IKOP)	All private members must contribute a minimum amount to the costs of the JUs' R&I projects. In Horizon Europe, the JUs' Single Basic Act (Art. 2) defines them as 'contributions by private members, constituent entities or the affiliated entities of either, by international organisations and by contributing partners, consisting of the eligible costs incurred by them in implementing indirect actions less the contribution of that joint undertaking and of the participating states of that joint undertaking to those costs'.
Innovation action	An action primarily consisting of activities that directly aim to produce plans and arrangements or designs for new, altered or improved products, processes or services, possibly including prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.
Interservice groups	Commission mechanism to ensure internal consistency of policy interventions.
Intervention logic	A (narrative) description and usually a diagram summarising how the intervention was expected to work. It describes the expected logic of the intervention or chain of events that should lead to the intended change
Joint undertakings (JUs)	Public-private institutionalised partnerships of the Union with industry and stakeholders for the joint funding and implementation of strategic R&I agendas under Article 187 of TFEO (via a dedicated funding body). Under Horizon 2020, these were: the Innovative Medicines Initiative 2 (IMI2); Electronic Components and Systems for European Leadership (ECSEL); Fuel Cells and Hydrogen (FCH); Clean Sky, Bio-based Industries (BBI); Shift2Rail (S2R); Single European Sky ATM Research (SESAR); and Fusion for Energy (F4E) – most of which also existed under FP7[5]. Under Horizon Europe, the JUs include: the Innovative Health Initiative (IHI); Global Health EDCTP3 Partnership, Europe High-Performance Computing (EuroHPC); the Chips JU (formerly, Key Digital Technologies, KDT); Smart Networks and Services (SNS); Circular Bio-based Europe (CBE); the Clean Aviation JU; the Clean Hydrogen JU; the Europe's Rail JU; and Single European Sky ATM Research 3 (SESAR 3).
Knowledge and Innovation Communities of the European Institute of Innovation and Technology (EIT KICs)	Institutionalised partnerships, as referred to in Regulation (EU) 2021/695, of higher education institutions, research organisations, companies and other stakeholders in the innovation process. They take the form of a strategic network, encouraged and funded by the EIT. The network can have various legal forms and carries out joint innovation planning (mid- to long-term), to develop innovative products and services, start or support new companies and train entrepreneurs, to meet the EIT challenges and contribute to attaining the objectives established under Regulation (EU) 2021/695. The EIT KICs launched prior to Horizon 2020 were EIT Climate-KIC (2010), EIT Digital (2010), EIT InnoEnergy (2010); the EIT KICs launched under Horizon 2020 included EIT Health (2014), EIT Raw Materials (2014), EIT Food (2016), EIT Manufacturing (2018) and EIT Urban Mobility (2018). The EIT Culture and Creativity has been launched in 2022 under Horizon Europe.
Leverage factor	The ratio (expressed as a number or a value in euro) between the total costs borne by partners other than the EU for R&I activities and the EU contribution to R&I activities. It is calculated for all measures of leverage set out above. For co-investment, the formula is: $\mathbf{CA_{Part} / CA_{EU}}$ And for total direct leverage (including additional activities): $\mathbf{(CA_{Part} + AA_{Part})/ (CA_{EU} + AA_{EU})}$.

[5] ECA annual report on EU Joint Undertakings for the financial year 2020, pp. 11-12, Figure 1.2. https://www.eca.europa.eu/Lists/ECADocuments/JUS_2020/JUS_2020_EN.pdf

	No financial data is available to this evaluation on additional activities funded by the EU ($\mathbf{AA_{EU}}$) which therefore equals to zero: this means other funding sources with their origin in the EU budget, such as cohesion policy funds, are not accounted for in additional activities.
Lighthouses	This concept/term is used by three EU Missions, in different ways: • Mission Soil: places for demonstration of solutions, training and communication that are exemplary in their performance in terms of soil health improvement. • Mission Ocean & Waters: sites piloting, demonstrating and deploying the Mission activities across EU sea and river basins. • Mission Cities: projects or initiatives with well-defined and measurable goals. They focus on implementation, fast delivery and creating a positive impact-minded culture in a specific area of action.
Living labs	This concept/term is used by two EU Missions, in somewhat different ways. • Mission Soil: user-centred, place-based and transdisciplinary R&I ecosystems, which involve land managers, scientists and other relevant partners in systemic research and co-design, testing, monitoring and evaluation of solutions, in real-life settings, to improve their effectiveness for soil health and accelerate adoption. • Mission Cities: open innovation ecosystems that are deployed in real-life environments. They serve to co-design, test, prototype and/or scale-up specific technical or social solutions.
National contact points	Network funded by the framework programme tasked with providing guidance, practical information and assistance on all aspects of participation in Horizon Europe.
Newcomer	Horizon Europe participant who was not involved in a Horizon 2020 project (not a Horizon 2020 participant). For Horizon 2020, a participant that was not involved in any FP7 project.
Openness	Horizon Europe is 'as open as possible as closed as necessary'. It is open to almost[6] all countries, 'by default'. It follows a non-discriminatory approach: researchers and innovators of any nationality can apply for grants (e.g. MSCA, ERC). According to Article 14 of the regulation establishing Horizon Europe, this principle does not apply to scientific publications which are all open.
Oversubscription rate	Share of eligible proposals evaluated as being above the quality threshold that were not retained due to budgetary constraints, out of all eligible proposals evaluated by experts with a score above the quality threshold.
Participant	Any legal entity carrying out an action or part of an action under Horizon Europe.
Participation	The involvement of a legal entity in a project. A single participant can be involved in multiple projects.
Policy mix	The set of activities, instruments and types of action used to implement Horizon Europe.
Prizes	Financial contribution (lump-sum) given as the prize in a contest. Prizes are a 'test-validate-scale' open innovation approach that brings together players who are new to an industry and small players that may pursue more radically new concepts than large, institutionalised contestants. Inducement prizes offer an incentive by mobilising new talent and engaging new solver communities around a specific challenge. They are only awarded based on the achievement of a set target, which solves a specific challenge.
Reciprocal access	Reciprocal access is a new requirement laid down in Article 16.4 of the Horizon Europe Regulation: entities from the EU should be permitted access to and, to the

[6] Russia and Belarus under sanctions; China cannot participate to innovation actions (IA) calls.

	extent possible, be allowed to participate in the equivalent programmes of associated countries. This clause refers only to the provision of *access* and not dedicated funding.
Regression discontinuity design (RDD)	A counterfactual impact evaluation (CIE) method. For more information, see Annex 2.
Final rate of reimbursement	Proportion of EU funding, i.e. the eligible cost of the action compared to the final grant amount[7].
Research and innovation action (RIA)	An action primarily consisting of activities aiming to establish new knowledge or to explore the feasibility of a new or improved technology, product, process, service or solution. This may include basic and applied research, technology development and integration, testing, demonstration and validation on a small-scale prototype in a laboratory or simulated environment.
Research output	The results generated by a given action to which access can be given in the form of scientific publications, data or other engineered results and processes such as software, algorithms, protocols and electronic notebooks.
Safeguards	Several articles in the Horizon Europe Regulation safeguard EU interests: • Art. 19 on ethics and integrity screening, Article 20 on security screening, • Art. 22.5 on protecting the EU's strategic assets, interests, autonomy or security, • Art. 22.6 on additional eligibility criteria based on specific policy requirements, Art. 39.6 and 40.4 with provisions on exploitation, dissemination and right to object to transfer of ownership and licences to non-associated third-country entities in line with EU interest.
Seal of excellence	A quality label which shows that a proposal submitted to a call for proposals exceeded all of the evaluation thresholds set out in the work programme, but could not be funded due to lack of budget available for that call for proposals in the work programme and might receive support from other EU or national sources of funding.
Social sciences and humanities (SSH)	The Horizon Europe programme guide lists the following SSH disciplines: *Social sciences, education, business and law* Social and behavioural sciences: economics, economic history, political science, sociology, demography, anthropology (except physical anthropology), ethnology, futurology, psychology, geography (except physical geography), peace and conflict studies, human rights. Education science: curriculum development in non-vocational and vocational subjects, educational policy and assessment, educational research. Journalism and information: journalism, library and museum sciences, documentation techniques, archival sciences. Business and administration: retailing, marketing, sales, public relations, real estate, finance, banking, insurance, investment analysis, accounting, auditing, management, public and institutional administration. Law: law, jurisprudence, history of law. *Humanities and the arts* Humanities: religion and theology, foreign languages and cultures, living or dead languages and their literature, area studies, native languages, current or vernacular language and its literature, interpretation and translation, linguistics, comparative literature, history, archaeology, philosophy, ethics. Arts: fine arts, performing arts, graphic and audio-visual arts, design, crafts.
Strategic R&I plan	This is an implementing act setting out a strategy to achieve the work programme. The strategy draws on a broad, mandatory multi-stakeholder consultation process and

[7] Annotated grant agreement, EU funding programmes 2021-2027, version 2024, p. 226. https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

	covers a maximum period of 4 years. It specifies the priorities, suitable types of action and forms of implementation to be used.
Success rate	The percentage of proposals that are selected for funding out of the total number of eligible proposals expressed as a percentage (Retained proposals/Eligible proposals*100).
Synergy	Synergy occurs when the impact of the results or programmes as a whole is greater than that of the sum of their individual impacts. There are different types of synergies. Upstream synergies are when another programme paves the way to apply to Horizon Europe. Downstream synergies are when other programmes take up the outputs of Horizon Europe and bring them to the market. Cumulative funding occurs when an operation/project that receives support from more than one fund, programme or instrument (including both shared and directly managed funds) for the same item of cost/expenditure. Combined funding is when an ERDF programme or another EU fund supports R&D projects that complement Horizon Europe projects. Transfers are resources allocated to Member States under shared management being - at the request of the Member State concerned - transferred to Horizon Europe. The Seal of excellence is explained under a separate entry above.
Technology readiness levels (TRL)	Technology readiness levels indicate the maturity level of particular technologies through a common understanding of technology status and address the entire innovation chain. TRL 1 – basic principles observed; TRL 2 – technology concept formulated; TRL 3 – experimental proof of concept; TRL 4 – technology validated in the lab; TRL 5 – technology validated in a suitable environment; TRL 6 – technology demonstrated in a suitable environment; TRL 7 – system prototype demonstration in an operational environment; TRL 8 – system complete and qualified; TRL 9 – actual system proven in an operational environment.
Time-to-Grant (TTG)	The time from the date of closure for a call for proposals (call deadline) and the date of signature of a grant by the European Commission. For two-stage calls, the second stage call deadline is used. The target for the Commission is 245 days (8 months). It is the sum of other two indicators, Time-to-Inform and Time-to-Sign (see below)
Time-to-Inform (TTI)	The time from the date of closure for a call for proposals (call deadline) and the date of communication of evaluation results (invitation letter). The target for the Commission is 153 days (5 months).
Time-to-Sign (TTS)	The time from the date of communication of evaluation results (invitation letter) and the date of signature of a grant by the European Commission. The target for the Commission is 92 days (3 months).
Total direct leverage	For European partnerships only: co-investment plus additional activities linked to the goal of the partnership, where applicable. It therefore represents the difference between the total costs of the R&I activities of the partnership (operational project costs, and additional activities) and the contribution of the EU to such activities. Contributions to the administrative costs of the partnership are not included. For non-partnerships, or partnerships without additional activities, this indicator is identical to co-investment.
Widening countries	Countries identified as 'low-performing' in R&I, and thus eligible to apply for actions dedicated to spreading excellence and widening participation. In Horizon Europe: • from the Member States, those countries are Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia; • for associated countries, the list of eligible countries is based on an indicator and published in the work programme[8]: Albania, Armenia, Bosnia Herzegovina, Faroe

[8] Article 2, point 17, Regulation 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the FP for Research and Innovation, http://data.europa.eu/eli/reg/2021/695/oj

	Islands, Georgia, Kosovo, Moldova, Montenegro, North Macedonia, Serbia, Tunisia, Türkiye, Ukraine, and once associated Morocco. Outermost regions of the EU (defined in Art. 349 TFEU) are also eligible for participation in widening actions. These are Guadeloupe, French Guiana, Martinique, Réunion, Saint-Barthélemy, Saint-Martin (France), the Azores, Madeira (Portugal, itself a widening Member State) and the Canary Islands (Spain).

1. Introduction: purpose and scope of the evaluation

Horizon Europe is the EU's ninth research and innovation (R&I) funding programme. Set up by Regulation (EU) 2021/695[9], it covers the period 2021-2027 and has a budget of EUR 93.5 billion[10]. The objective of the interim evaluation of Horizon Europe is to analyse the programme's design, implementation and first results. It is published 4 years after the start of the implementation. It covers all instruments, in every scientific field supported. This evaluation will support the implementation of current EU R&I measures and the design of future measures. It fulfils the Commission's legal obligation to explain how it has spent public funds.

The evaluation addresses the **better regulation criteria** of relevance, coherence, efficiency and effectiveness, and the EU value added of the Horizon Europe programme. It investigates the rationale for the programme, its implementation and achievements, and the longer-term impacts of EU investment in research and innovation. Effectiveness is assessed for the first time following the **Key Impact Pathways** towards the programme's scientific, societal and economic impacts. The efficiency analysis reviews costs and benefits for applicants to the programme and includes an assessment of potential unnecessary burdens and complexities for applicants and participants.

The evaluation faced some data limitations, described in Annex 2. In addition, it is widely acknowledged that it takes time for R&I activities to produce results, outcomes, and impacts and given the lifecycle of research and innovation projects, their impact is expected to become apparent only towards the end of the programme period – or even later.

The evaluation is based on the 15 148 signed projects as of 6 January 2025, including 983 closed projects (6.5%)[11]. This evaluation also assesses the performance of ongoing projects and steps taken for future implementation.

Evaluations of 19 institutionalised partnerships are set out in annexes to this evaluation. They are:

- Eight Knowledge and Innovation Communities of the European Institute of Innovation and Technology[12] (EIT Health, EIT Manufacturing, EIT Raw Materials, EIT Digital, EIT Urban Mobility, EIT Climate KIC, EIT Food, EIT InnoEnergy).
- Nine joint undertakings under the Single Basic Act[13] (Europe Rail, Single European Sky, the Chips JU (previously Key Digital Technologies JU), Smart Network and Services, Global Health EDCTP3, Clean Hydrogen, Circular Bio-based Europe, Clean Aviation and Innovative Health Initiative). Their evaluation includes a final evaluation of the preceding JUs under Horizon 2020, covering a period of 10 years of support by the EU budget.
- The European High Performance Computing JU (EuroHPC).

[9] Complemented by Council Decision (EU) 2021/764 of 10 May 2021 establishing the Specific Programme implementing Horizon Europe

[10] The mid-term revision of the multi-annual financial framework (MFF) in February 2024 has resulted in a net reduction of EUR 2.1 billion for the Horizon Europe programme over 2025-2027 (redeployed to cover new initiatives), but also added EUR 100 million from previously decommitted funds.

[11] This number also includes 30 suspended and 134 terminated projects.

[12] According to Article 20 of the EIT Regulation 'The Commission (...) shall carry out an interim and final evaluation of the EIT and the KICs. Those evaluations shall feed into the HE evaluations provided for in Art. 52 of Regulation (EU) 2021/695.'

[13] Art. 171.4: 4. States that 'The Commission shall carry out an interim and final evaluation of each JU feeding into the Horizon Europe evaluations (...).' Art 174.13: 3. States that 'The interim evaluations shall include a final evaluation of the preceding JUs.'

- The European Metrology Programme for Innovation and Research ('Article 185' initiative)[14].

The European Defence Fund, a specific programme of Horizon Europe, is outside the scope of this evaluation. It will be evaluated separately in the second quarter of 2025.

2. What are the expected outcomes of Horizon Europe?

2.1 Horizon Europe and its objectives

The Horizon 2020 interim evaluation and Horizon Europe impact assessment identified four key R&I challenges that should be tackled through future R&I programmes:

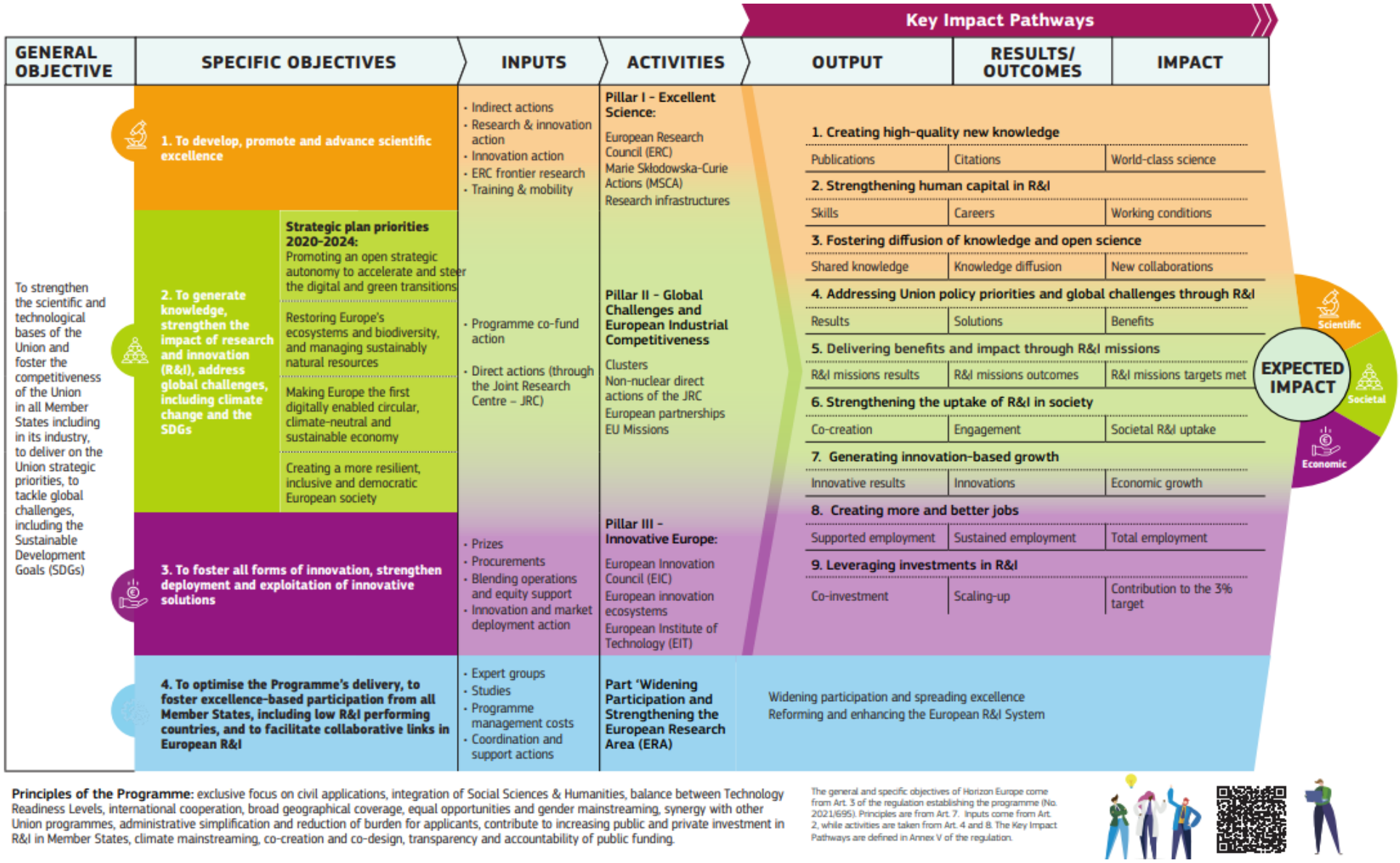
1) The creation and diffusion of high-quality new knowledge and innovation in Europe should be improved.
2) The impact of R&I should be reinforced to deliver on EU priorities.
3) The lack of rapid uptake of innovative solutions in the EU should be addressed.
4) The European Research Area (ERA) needs to be strengthened.

Based on these challenges, Horizon Europe aimed at promoting scientific excellence, generating new knowledge and high-quality technologies, addressing EU priorities and global challenges, providing the appropriate environment, and scaling up finance to turn great ideas into products and services that will create sustainable jobs and economic growth.

The **general objective** of Horizon Europe is to 'deliver scientific, technological, economic and societal impact from the Union's investments in R&I so as to strengthen the scientific and technological bases of the Union and foster the competitiveness of the Union in all Member States including in its industry, to deliver on the Union strategic priorities and to contribute to the realisation of Union objectives and policies, to tackle global challenges, including the SDGs by following the principles of the 2030 Agenda and the Paris Agreement, and to strengthen the ERA'[15]. The Programme's **specific objectives** and intervention logic are shown in Figure 1.

[14] The evaluation provision of the European partnership on Metrology decision of 2021 foresees that "The Commission shall conduct an interim evaluation and a final evaluation of the Metrology Partnership in the framework of the Horizon Europe evaluations, in accordance with Article 52 of Regulation (EU) 2021/695.
[15] Article 3, Regulation 2021/695. http://data.europa.eu/eli/reg/2021/695/oj

Figure 1: Horizon Europe intervention logic



Principles of the Programme: exclusive focus on civil applications, integration of Social Sciences & Humanities, balance between Technology Readiness Levels, international cooperation, broad geographical coverage, equal opportunities and gender mainstreaming, synergy with other Union programmes, administrative simplification and reduction of burden for applicants, contribute to increasing public and private investment in R&I in Member States, climate mainstreaming, co-creation and co-design, transparency and accountability of public funding.

The general and specific objectives of Horizon Europe come from Art. 3 of the regulation establishing the programme (No. 2021/695). Principles are from Art. 7. Inputs come from Art. 2, while activities are taken from Art. 4 and 8. The Key Impact Pathways are defined in Annex V of the regulation.

Horizon Europe brought a considerable change compared to previous framework programmes by introducing **Key Impact Pathways** (KIPs for short, listed on the right-hand side of Figure 1). Every KIP is monitored using a short-term, medium-term and longer-term indicator[16]. Support for basic research remains a cornerstone of the programme, pursued primarily under the first pillar (Excellent Science), but also in the other two pillars. Applied research and incremental innovation are the centre of gravity in the second pillar, addressing both industrial and societal needs (Global challenges and European industrial competitiveness), while innovation is the focus of the third pillar (Innovative Europe). The **mission-oriented** approach provides direction to all activities supported by the programme. The European Partnerships approach was also reinforced under Horizon Europe to become more strategic, coherent, and impact-driven.

The strategic orientations for R&I investments are defined in the multi-annual Horizon Europe strategic plans which act as a compass for defining Horizon Europe's activities. Topics from the Work Programmes come from the Strategic Plan[17].

Support to **innovation ecosystems** was reinforced under Horizon Europe, and it was given a dedicated programme part under the Innovative Europe pillar. The European innovation ecosystem 'encompasses relations between material resources (such as funds, equipment, and facilities), institutional entities (such as higher education institutions and support services, research and technology organisations, companies, venture capitalists and financial intermediaries) and national, regional and local policy-making and funding entities'[18].

JRC's direct research actions are funded under the framework programme, continuing its role as in previous periods, to generate scientific evidence for good public policies[19].

Figure 2: Horizon Europe programme structure

The Horizon Europe Regulation identifies gender equality as a cross-cutting requirement to be followed during implementation[20] and underlines the relevance of social sciences and humanities in the description of cluster priorities. It also states that 'the activities developed under the

[16] Described in more detail in the Commission SWD(2023) 132 final: 'Evidence Framework on monitoring and evaluation of Horizon Europe'. https://research-and-innovation.ec.europa.eu/system/files/2023-05/swd-2023-132-monitoring-evaluation-he.pdf.

[17] The Strategic Plan relevant for the evaluation period is available at: https://commission.europa.eu/system/files/2021-09/ec_rtd_horizon-europe-strategic-plan-2021-24.pdf

[18] Regulation 2021/695, Article 2.

[19] Ibid, Annex 1.

[20] Ibid, Article 7(6).

Programme should aim to **eliminate gender bias and inequalities, enhancing work-life balance and promoting equality between women and men in R&I**, including the principle of equal pay without discrimination based on sex', that 'the gender dimension should be integrated in R&I content and followed through at all stages of the research cycle' and that 'activities under the Programme should aim to eliminate inequalities and promote equality and diversity in all aspects of R&I with regard to age, disability, race and ethnicity, religion or belief, and sexual orientation'[21].

The importance of **exploiting** research and innovation results is also underlined in the Regulation: 'More emphasis should be placed on exploiting those results, and the Commission should identify and help maximise opportunities for beneficiaries to exploit results, in particular in the Union'[22]. This aspect is also integrated in the third specific objective. While exploitation is not obligatory, a 'best effort' is expected from beneficiaries[23].

Horizon Europe has several new features, compared to the preceding programme:

1. strategic plans, multi-annual strategic documents co-designed with stakeholders to guide preparations for bi-annual work programmes;
2. a new instrument: EU missions;
3. streamlined European partnerships;
4. enhanced synergies with other EU and national programmes;
5. a stronger open science policy, to promote collaboration;
6. an updated monitoring system.

The Horizon Europe Work Programme Group discusses indicative timelines for work programme preparation and provides guidance for topic drafting. The group has over 300 members from DGs AGRI, BUDG, CLIMA, CNECT, COMP, DEFIS, DIGIT, EAC, ECFIN, EMPL, ENER, ENV, GROW, HERA, HOME, IAS, JRC, MARE, MOVE, REGIO, RTD, SANTE, SG, TRADE. In addition, representatives from the Executive Agencies (CINEA, EISMEA, ERCEA, HADEA, REA) and the Joint Undertakings (Circular Bio-based Europe, Clean Aviation, Clean Hydrogen, EU Rail, Innovative Health Initiative, Key Digital Technologies) are also part of this group. The Horizon Europe 'main' work programme 2023-2024 and limited extension to 2025 contains 1 060 topics and other actions. The work programme 2023-2024 has 3 297 pages.

The initial budget for Horizon Europe was set at EUR 95.5 billion[24] for 2021-2027. In February 2024, the Council unanimously agreed, and the European Parliament gave consent, to the first ever mid-term revision of the expenditure ceilings in the multi-annual financial framework (MFF). The revision included a redeployment of EUR 2.1 billion from Horizon Europe to cover new initiatives but also added EUR 100 million from previously decommitted funds. Therefore, Horizon Europe Programme budget now stands at EUR 93.5 billion for 2021-2027[25]. The budget of the framework programme draws on a number of sources in addition to the one directly established in its legal base. Added to funds within the MFF[26], were EUR 5.4 billion from the Next Generation EU (NGEU) instrument in support of the green and digital recovery from the COVID crisis, as well as reused decommitted funds[27]. Funding is allocated through work programmes, which can be either annual or multi-annual, covering different parts of the

[21] Ibid, recital point 53.
[22] Ibid, recital point 85.
[23] Ibid, Article 39.
[24] Excluding EFTA and third country contributions.
[25] Excluding EFTA and third country contributions.
[26] EUR 84.2 million from MFF (Horizon Europe's legal base) and EUR 3 447 million estimative fines as per Article 5 of the MFF Regulation (fines linked to competition rules and other penalties, sanctions and imposed interest).
[27] In total, the budget includes EUR 678 million estimative reconstitution of decommitments as per Financial Regulation Art 15.3 (Joint declaration).

framework programme. In evaluating project proposals, the following criteria were assessed: (a) excellence; (b) impact; and (c) quality and efficiency[28].

2.2 Points of comparison

This evaluation compares the current Horizon Europe results to those from the same stage of implementation in Horizon 2020. This is the case for the KIP indicators and contribution to Sustainable Development Goals. For funding by country category, success rates, as well as the gender balance indicators – data is compared with the final Horizon 2020 averages.

Where the expected effects were quantitatively estimated or targets were set in the legal base, this evaluation compares the actual Horizon Europe data to these expectations. This is the case for the efficiency metrics (time to contract, time to pay, error rate, etc.) and leverage factors per JU.

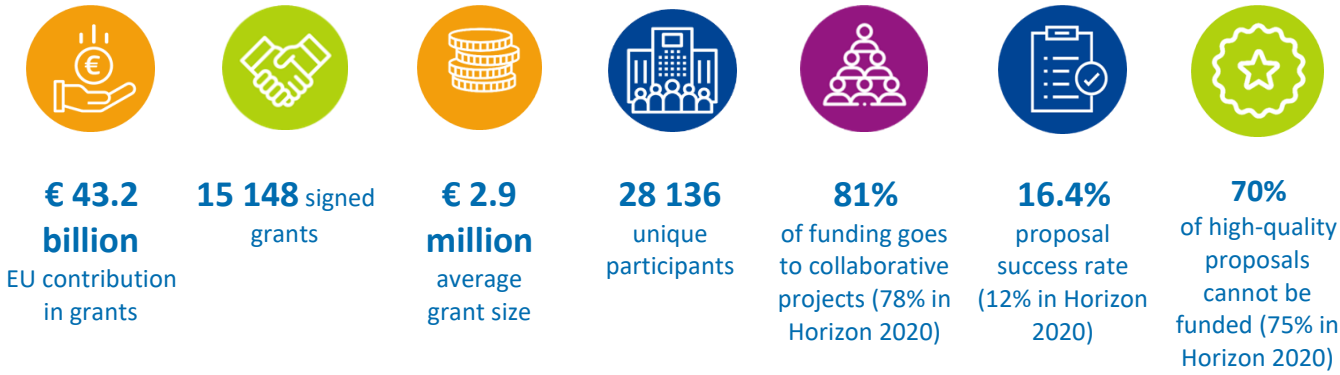
If none of the above is possible, newly available data on Horizon Europe is presented without any baseline or benchmark. This is the case for KIP indicators that did not have an exact equivalent using a comparable methodology in the previous framework programme (e.g. KIP 2 and KIP 6), the share of funding spent on gender equality objectives and biodiversity, as well as some of the new indicators for the EIT KICs.

For all the KIP indicators, data comes from validated periodic project reports in the central database, which is also used for comparison with the baseline from Horizon 2020. In sections on some specific programme parts (i.e. the ERC, MSCA, EIT), the implementing entities also provided data from their internal, continuous monitoring.

3. How has the situation evolved during the evaluation period?

Horizon Europe was launched in April 2021 with a total budget of EUR 95.5 billion, which was reduced to EUR 93.5 billion in February 2024. By the end of 2024, 58.4% of the voted budget (including NGEU funds) had been committed and 34.5% of the payments made.

Figure 3: Horizon Europe key figures



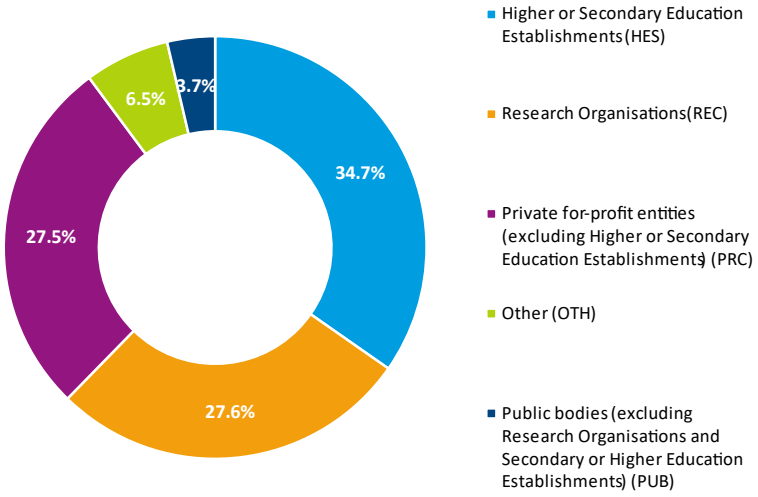
Source: All figures in this chapter come from CORDA[29] and the cut-off date is 6 January 2025.

[28] Ibid, Article 28.

[29] For cascading actions in European partnerships (primarily EIT KICs and co-funded partnerships), the evaluation data source only includes the amounts for the grant initiating the partnership. This should be intended as an *ex-ante* value, as at the reference date the partnership may have not used the Commission grant in full. For more information about this data limitation, see section 4.2.5.

Between 2021 and 2024, **15 148 grants** were signed, with a value of **EUR 43.2 billion** in EU contribution. Slightly more than half of Horizon Europe participants (51.1%) are newcomers, i.e. they did not participate in any Horizon 2020 project. Most newcomers are from the private sector, SMEs in particular.

Figure 4: Distribution of Horizon Europe grant funding by type of beneficiary



Higher education establishments have received the largest contribution (EUR 15.0 billion), followed by research organisations and private for-profit entities, which received similar amounts of contributions (EUR 11.9 billion). Around 16 220 private-for-profit entities (companies) were supported through grants, out of which 2 571 in pillar III (excluding the EIC Fund).

The share of funding per type of organisation is similar to Horizon 2020. Across the entire Horizon Europe programme, 81% of EU funding has been allocated to collaborative projects; in Horizon 2020, this was 78%[30].

A total of **10 077 SMEs received grants for EUR 7.4 billion**. Each SME joined on average 1.7 projects. **Pillar II involves 70% of all SME unique participants, and a majority of all EU contributions for SMEs, with EUR 4.7 billion allocated to them (68%).** Within Pillar II, joint undertakings contributed EUR 697 million to SMEs, 15% of the funds managed by JUs. Pillar III plays an increasingly important role: the European Innovation Council alone issued EUR 1.8 billion in grants to SMEs, more than any other programme part.

Additionally, the EIC Fund has approved equity investments towards start-ups and SMEs for further EUR 1.7 billion[31] for the Horizon Europe period alone. This leads to a total amount of Horizon Europe funding allocated to SMEs of EUR 9.1 billion as of 6 January 2025 (20.3% of total FP funding including approved equity investments). However, just around one third of approved EIC Fund investments (EUR 0.57 billion) have actually been paid out to beneficiaries to date[32].

[30] SWD(2024)29final, p. 16.
[31] The Horizon Europe EIC Fund figures are provided by the European Investment Bank, which manages the Fund on behalf of the Commission. The reference date is 1 December 2024. Unless where expressly specified, statistics in this section do not include the EIC Fund.
[32] For more statistics and analysis on SMEs (at an earlier reference date), see European Commission, SME participation in Horizon Europe, EU Publications Office, 2024.

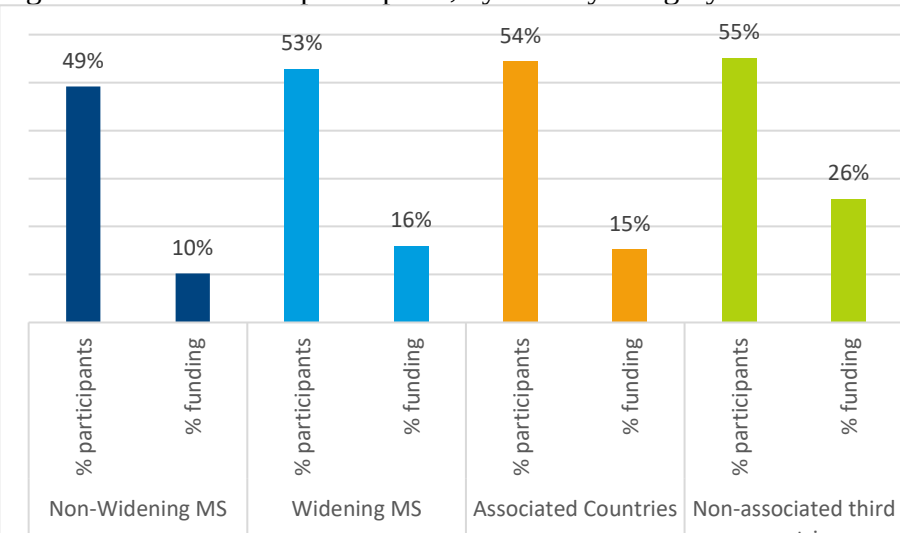
The Horizon Europe 15 ‘widening’ Member States[33] have received 14% of all the funding to date[34] - the same 15 MS had received 9% of the total funding in Horizon 2020[35]. Still, entities in four ‘non-widening’ Member States – Germany, France, Spain, and the Netherlands, in this order – received 50.9% of all Horizon Europe funding. Nonetheless, according to a monitoring report by the Commission[36], once EU contribution is weighted by national R&D expenditure, beneficiaries from widening Member States received double the amount as beneficiaries from other Member States.

Number of new programme participants on the rise

Newcomer organisations currently represent a majority of all grant participants: 51%. The share is nonetheless significantly lower than at the end of Horizon 2020, where almost three-quarters of all participants were not recorded in FP7.

14 365 newcomers have received **EUR 4.2 billion** in EU contribution. This is about 12% of all funding allocated under Horizon Europe.

Figure 5: Share of new participants, by country category



The discrepancy between the high share of participants and the relatively low share of funding to newcomers is due to the fact that most newcomers are small organisations, joining on average only one or two projects per framework programme. Larger organisations, which participate in many more projects and are also much more likely to be coordinators, are rarely Horizon Europe newcomers: just 4% of universities and 7% of research organisations coordinating projects did not participate in Horizon 2020.

More than half of all private for-profit participants and SMEs are newcomers (56.8%), as are those in the ‘other’ organisations category (e.g. civil society organisations) (59.2%). Around a quarter of higher education institutions in the programme are newcomers (23.7%), but they receive a negligible share of all funding (less than 1%). Among EIC Fund beneficiaries, 67% (165 organisations) are newcomers to Horizon Europe. The amount of EIC Fund investment approved towards newcomers is EUR 1.1 billion (65% of all investments approved by the Fund).

[33] The Widening Member States in Horizon Europe are: Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, and Slovenia.
[34] Entities from the Horizon Europe 15 ‘widening’ Member States received 15% of the funding going to EU27 beneficiaries - those same 15 MS had received 12% of funding for EU27 beneficiaries in Horizon 2020.
[35] Looking even further back, the Horizon Europe 15 ‘widening’ Member States account for 8% of the total funding in FP7 (cut-off date: 6 January 2025).
[36] European Commission, Country Participation in the EU R&I Framework Programmes: A retrospective on the first three years of Horizon Europe (2021-2023), 2024, https://data.europa.eu/doi/10.2777/485995, p. 11.

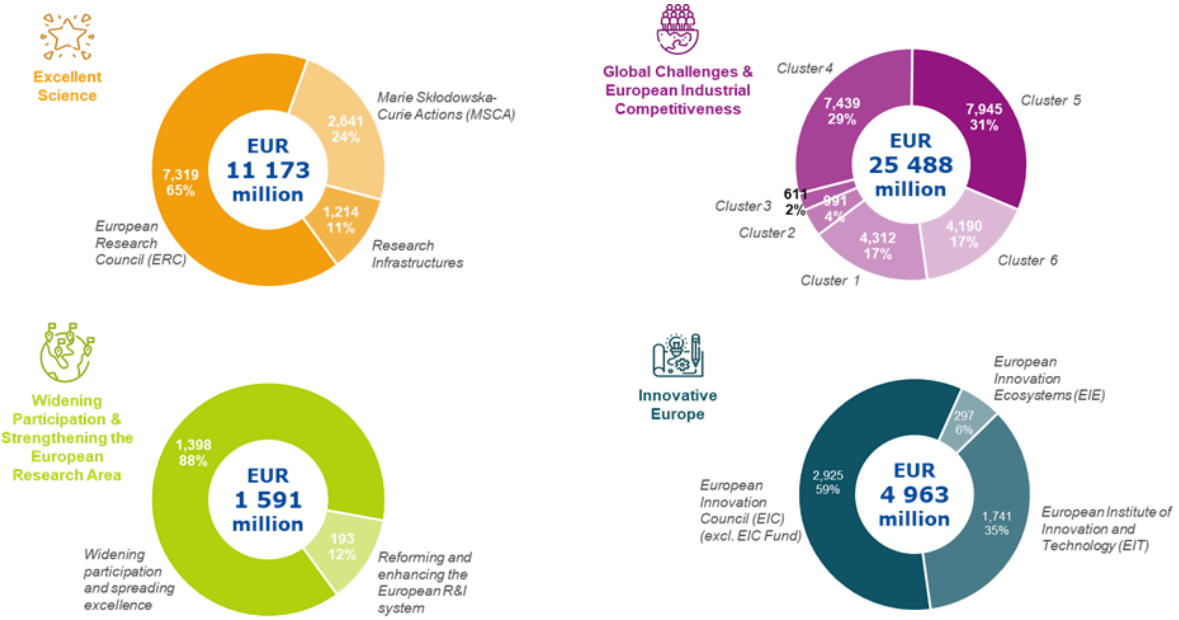
More collaborative projects and larger grants

More than eight out of every 10 euro went to **collaborative projects**, primarily in Pillar II – representing an increase from 78% in Horizon 2020. The average size of consortia increased from 12 partners in Horizon 2020[37] – to 16 partners in Horizon Europe Pillar II to date.

The average grant size is around **EUR 2.9 million** under Horizon Europe (compared to EUR 1.9 million under Horizon 2020, not adjusting for inflation). The major factors contributing to the larger average grant size are the discontinuation of the phase 1 of the SME instrument which used to award small grants (EUR 50 000 per project) to SMEs, and the introduction of larger grants under the EIC[38].

The largest share of funding was allocated to Pillar II – Global Challenges and European Industrial Competitiveness (59.0%), of which 60.4% was allocated to the climate and digital clusters of activities. The Excellent Science pillar accounts for 25.9% of the funding, allocated mainly through the European Research Council. The two other pillars share the remaining 15.2% of funding.

Figure 6: Distribution of Horizon Europe funding by pillar and programme part

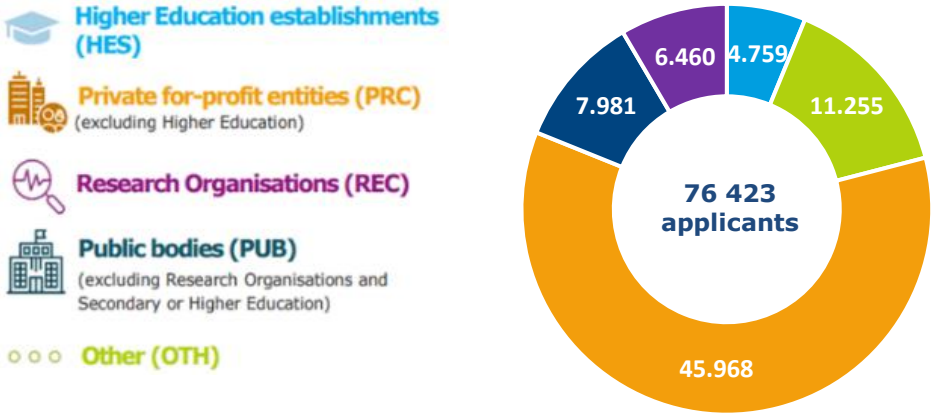


Horizon Europe has had a higher success rate than its predecessor, but nevertheless, 7 out of 10 high-quality proposals could not be funded due to the budgetary limitations.

The programme has been very sought after, receiving **88 803 eligible proposals** to 531 fully evaluated calls. On average, each call comprised 4 topics.

[37] Pillars II and III excluding the SME instrument in Horizon 2020.
[38] European Commission, DG for Research and Innovation, SME participation in Horizon Europe, Publications Office of the EU, 2024, p. 10. https://data.europa.eu/doi/10.2777/576670

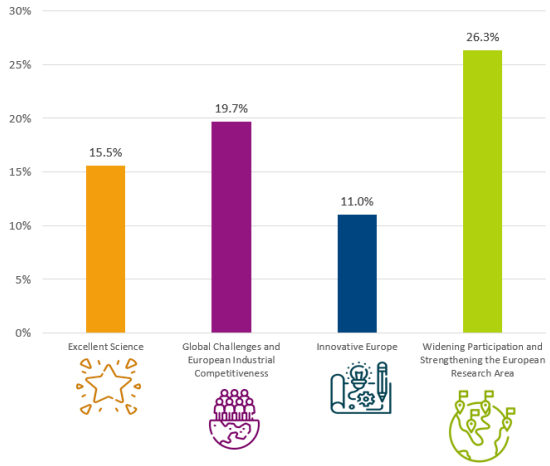
Figure 7: Distribution of Horizon Europe applications by type of organisation



A total of **76 423 applicants** had applied to the programme by 6 January 2025. Each was involved in 6.1 proposals on average. Most applicants were private for-profit entities (45 968) that had applied an average of three times. At the opposite end of the spectrum, 4 759 applicants were from higher education entities, each of which were involved in 37.5 proposals on average. Each research organisation applied an average of 14.4 times.

The **average success rate of proposals has increased** from 12% in Horizon 2020 to 16.4% in Horizon Europe. Success rates vary by pillar, but there are no major differences between country groups. The quality of the proposals has also improved compared to Horizon 2020, 54.6% of them being assessed as high quality by external experts, compared to 46% in Horizon 2020. Only 30.1% of the high-quality proposals could however be funded with the available budget. Even though this is an improvement on Horizon 2020 (25%), an **additional EUR 81.8 billion** (1.9 times the budget allocated to date) would have been needed to fund them all. To promote support through other means at national or regional level, 7 166 of the unfunded proposals have received a Seal of Excellence certificate.

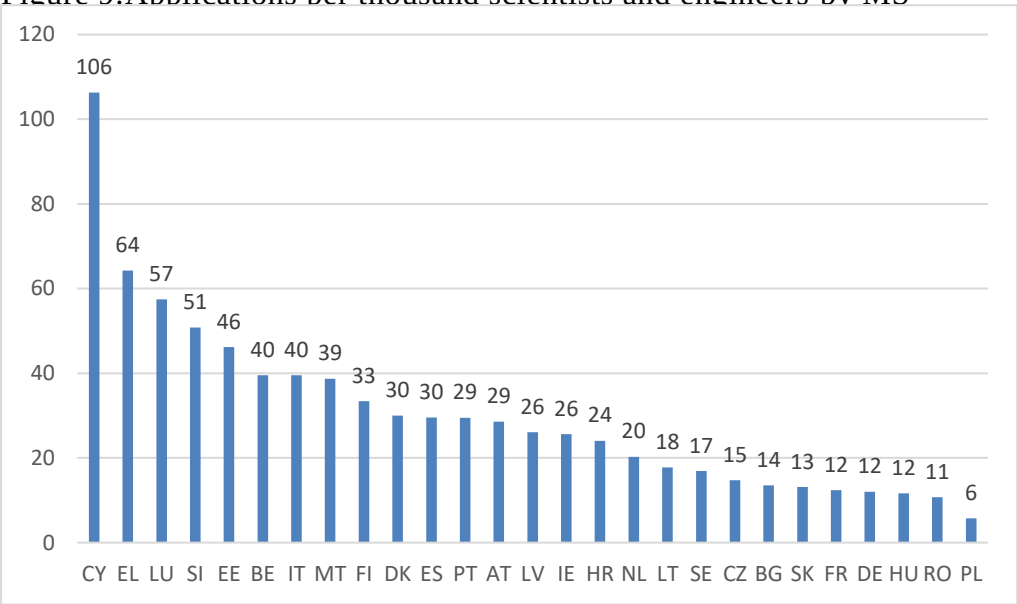
Figure 8: Horizon Europe success rates



A wider geographical coverage and higher success rates from the widening Member States than in Horizon 2020

The programme received applications with participants from **194 countries**[39].

Figure 9:Applications per thousand scientists and engineers by MS



20

Applications per thousand scientists and engineers in the EU

Entities located in the 15 **widening Member States** submitted fewer applications than those in the other Member States and accounted for 19.8% of all applications. Some widening Member States (Estonia, Hungary, Lithuania, Slovakia, Slovenia) have an application success rate close to the programme average (20%). It should be noted that the 15 widening Member States are home to 26% of the EU population of scientists and engineers.

Associated countries account for 12.6% of applications (mostly the UK, Norway, Türkiye, Israel, and Serbia), while non-associated **third countries** represent 5.6% (mostly Switzerland, US and China). Most associated-country applications were from the United Kingdom (6.1% of total applications and 48.5% of associated-country applications). Although the UK became an Associated Country on 1 January 2024, it is treated as an Associated Country for all grants and proposals from the start of the Programme (2021) in this analysis.

Additional data, including for European Partnerships and EU Missions, is available in Annex 8.

4. Evaluation findings

4.1 To what extent has Horizon Europe been successful so far and why?

This section provides an evidence-based assessment of the successes and shortcomings of the Horizon Europe programme in terms of its effectiveness, efficiency and coherence. It begins by examining how effectively Horizon Europe has contributed so far to its scientific, societal and economic objectives, as well as the objectives of spreading excellence and widening participation. The section then considers the cost of pursuing these objectives. Finally, it provides evidence of the degree to which the programme has operated in a coherent way, both internally between its different instruments, and externally with other EU and national programmes.

[39] Including Member States (widening and not widening) and third countries (associated and non-associated), see lists in glossary.

4.1.1. Effectiveness: **Towards scientific impacts** – To what extent has Horizon Europe advanced scientific excellence (Key Impact Pathways 1-3)?

This section assesses Horizon Europe's contribution to the three Key Impact Pathways focusing on 'Creating high-quality new knowledge'; 'Strengthening human capital in R&I'; and 'Fostering diffusion of knowledge and Open Science'.

Figure 10: Scientific impacts of Horizon Europe – Key Impact Pathways 1-3

Source: Annex V to Regulation 2021/695

What messages emerged from the stakeholder consultation?

The majority of respondents either agreed or strongly agreed with the statement that **Horizon Europe helped to develop, promote and advance scientific excellence** (83%; 1 301). Disaggregating by category of respondent revealed that companies (84%; 225), academic and research institutions (84%; 673) and business associations (87%; 33) deem Horizon Europe to be successful in developing, promoting and advancing scientific excellence. Conversely, 4% (67) of all respondents either disagreed or strongly disagreed with the statement that Horizon Europe helped to develop, promote and advance scientific excellence (67). Among this small minority, respondents from academic / research institutions constitute the largest proportion, representing 69% (46).

Creating high-quality new knowledge (Key Impact Pathway 1)

As of 6 January 2025, Horizon Europe beneficiaries reported 6 922 peer-reviewed scientific publications that had been validated by the Commission departments. Excluding the publications reported by the Joint Research Centre, Horizon Europe projects reported 4 299 peer-reviewed publications. Under Horizon 2020, at a comparable stage of advancement[40] and excluding publications under the direct actions of the JRC, beneficiaries had reported 2 827 validated peer-reviewed publications.

In past framework programmes, publications were mainly reported once the projects had been closed. For example, under Horizon 2020, grantees reported approximately 245 000 peer-reviewed scientific publications[41], 43% of which were reported in 2021 or later, when the implementation period of Horizon 2020 had ended.

The R&I framework programme continues to support excellent science – between 1985[42] and 2023, it supported 35 Nobel Prize winners[43] - two more than were reported in the *ex post* evaluation of Horizon 2020.

What messages emerged from the stakeholder consultation?

Stakeholders share the view that **scientific publications** have the highest potential impact on disseminating and exploiting results vis-à-vis workshops, events, project websites, patents and Commission exploitation support services: 68% (1 056) of respondents indicated that scientific publications help to a great extent to disseminate

[40] 31 March 2017, i.e. 3 years and 3 months after the start of the programme.
[41] Figure from Commission monitoring systems (CORDA), 2 December 2024.
In line with the Key Impact Pathways' methodology, the figure only encompasses peer-reviewed publications that the Commission could match to an external database for verification (Scopus). This verification step was not carried out in the past, including at the time of the final evaluation of Horizon 2020. The figure for Horizon 2020 might still change in the future as the matching methodology is improved and more publications are matched.
[42] 1985 is the second year of the existence of the Framework Programme for Research and Innovation.
[43] Programme Performance Statement, June 2024.

and exploit results. Research institutions and citizens deem scientific publications most useful (approximately 75% of each group: 596 and 160 respondents respectively). Conversely, business associations and companies saw less potential for scientific publications, with less than 10% indicating that they only helped a little or not at all to disseminate and exploit results (8% (3) and 7% (17) respectively).

Strengthening human capital in R&I (Key Impact Pathway 2)

A total of 95 156 researchers are benefiting from upskilling activities under Horizon Europe, of which 44.14% are women. In addition, MSCA have registered 8 307 researchers benefitting from mobility grants, while the ERC has registered 1 662 such researchers. The EIT KICs also contribute to this KIP through the upskilling/reskilling of the workforce within strategic value chains. More data is available in the EIT dedicated section below.

Fostering diffusion of knowledge and open science (Key Impact Pathway 3)

A total of 10 222 publications – including non-peer-reviewed scientific articles – have been reported so far under Horizon Europe, over 79% of which are reported by beneficiaries as available in open access (OA)[44]. This is a moderate increase compared to Horizon 2020, which had 69.8% at the same stage of advancement.

Horizon Europe's mechanisms for driving the uptake of open science at national level include: 1) supporting the development of knowledge and tools on open science; 2) supporting the development of research and technology infrastructures, environments and platforms that enable open access practices; and 3) inspiring the uptake of open science practices through guidelines, the requirements of the FP and participation in Missions and consensus-building activities[45].

- Clusters 1, 2, 5 and 6 have promoted open access in the work programmes, but as many projects are still at an early stage it is premature to provide feedback on open-source matters[46].
- Cluster 3, and to a lesser extent Cluster 4, have more restrictions than other clusters, that apply to sensitive actions that use classified background information and/or produce security-sensitive results[47].

The main barrier to publishing in open access is accessing sufficient funds to pay for the fees required by some journals or data repositories[48]. The Horizon Europe Regulation states that if the results are not exploited within a given period, the beneficiary shall use an online platform to find interested parties to exploit those results[49]. In 2021, the European Commission created Open Research Europe[50], a free open access publishing platform for European Commission-funded researchers across all subject areas. As of October 2024, over 750 peer-reviewed publications and 1 500 peer-reviews are available on the platform. Over 1600 authors from nearly 1000 institutions have published in Open Research Europe.

What messages emerged from the stakeholder consultation?

Over a third (35%; 535) of respondents indicated that **open science activities** for early sharing of results help to disseminate, exploit and access research and innovation results to a great extent. This view is particularly prevalent among non-EU citizens (51%; 18), followed by EU citizens (39%; 73) and academia (38%; 299). Overall, 73% of all respondents (1 114) indicated that open science activities either helped either to a great extent, somewhat or a little. Only 4% (56) held the view that open science activities did not help to disseminate, exploit

[44] Verification of the self-reported data against external data sources was still in progress at the time of this evaluation. The share does not include all JRC publications, 81% of which are published in open access.
[45] Excellent Science evaluation study, 2024, section 4.1.1.4, https://data.europa.eu/doi/10.2777/2295765
[46] Resilient Europe evaluation study, section 7.6, https://data.europa.eu/doi/10.2777/797281. Green Transition evaluation study 3.6.1.2, p. 69, https://data.europa.eu/doi/10.2777/67934
[47] Ibid.
[48] Excellent Science evaluation study, 2024, Executive Summary, p. 2, https://data.europa.eu/doi/10.2777/7542049
[49] See Art. 39, Regulation (EU) 2021/695 establishing Horizon Europe.
[50] https://open-research-europe.ec.europa.eu/

and access R&I results at all. 23% of all respondents indicated that they either do not know or do not hold any views on the matter (355).

European Research Council (ERC)

According to statistics provided by ERCEA, Horizon Europe ERC grantees have published 2 181 peer reviewed scientific publications by the end of 2024[51].

One of the objectives of Horizon Europe has been to attract talent to Europe. In the programme's first 4 years, around 2% of applicants to the ERC's schemes came from non-associated countries[52] and they made up nearly 1.5% of successful ERC applicants taking up a grant[53]. Almost half of these grantees came from the US, followed by Australia, India, South Africa, Cameroon and Uganda.

In addition, the survey and the interviews with ERC beneficiaries confirmed the impacts of obtaining an ERC grant on principal investigators (PIs) and their research teams[54]. The main effects cited by interviewees include strengthening their reputation as a researcher, the capacity to conduct frontier research, and the possibility to establish and consolidate their own research group. In addition, according to the survey, ERC grants give PIs the opportunity to improve their skills, mostly in project and people management, as well as in scientific methods and/or techniques. Intersectoral mobility among ERC beneficiaries is very limited, but international mobility opportunities are highly appreciated[55].

Marie Skłodowska-Curie actions (MSCA)

A total of 65 000 researchers are expected to benefit from MSCA under Horizon Europe, including 25 000 PhD candidates[56]. Of these, MSCA reports more than 8 300 researchers to have already been recruited under Horizon Europe. The MSCA also contribute to producing excellent science through peer reviewed scientific publications (361; 5% of all publications reported under KIP 1).

Postdoctoral fellows benefitting from the MSCA particularly value the freedom to pursue their specific research agendas (91%[57]) and the opportunity to engage in fundamental research (86%)[58]. Moreover, 95% of MSCA postdoctoral fellows affirm that the opportunities provided align with their need to improve their skills and competencies[59]. Countries with the most advanced and attractive research systems continue to host the largest shares of researchers. As with Horizon 2020, the programme also continues to support fellows in returning to their home countries, particularly Greece, Italy, Cyprus and Spain.

[51] The number follows a different methodology from the KIP 1 short-term indicator reported above and should not be counted as a percentage of the latter. Specifically, it is calculated based on the continuous reporting system of projects, which is in principle more up to date but may be subject to revisions when 'official' periodic reports are submitted.

[52] Applicants from Switzerland and the UK have been excluded from this analysis as these were not associated countries in 2021-2023.

[53] Figure from Commission monitoring systems (CORDA), 6 January 2025.

[54] Excellent Science evaluation study, 2024, Annex 1 – executive summary – ERC, pp. 20-21. https://data.europa.eu/doi/10.2777/9552959

[55] Ibid, Annex 1 1.3, p. 55. 61% of responding beneficiaries (146 out of 241) stated that their ERC project responds to a 'very large' or 'large' extent to their needs for international mobility opportunities.

[56] Performance tables of the annual mid-term and annual activity reports, as well as the Horizon programme performance statement (PPS), https://commission.europa.eu/document/download/95839d74-fc50-4ea5-81c9-854efefb7eed_en?filename=eac_mp_2024.pdf, p. 35.

[57] Excellent Science evaluation study Annexes, p. 22. 804 survey respondents. For all MSCA PF applicants: 65%, 1820 survey respondents.

[58] 705 survey respondents. For all MSCA PF applicants: 60%, 1671 survey respondents.

[59] Ibid. 782 survey respondents. For all MSCA PF applicants: 74%, 2 047 survey respondents.

According to the survey, 75% of MSCA postdoctoral fellows are satisfied with the supervision provided and agree that the arrangements in place are clearly defined[60]. Nine out of 10 surveyed researchers report that participating in the programme helped them obtain a research position with better career prospects (87%)[61]. A majority of respondents also expect their Horizon Europe project to improve the working conditions of researchers[62] and the provision of career advice[63] For quality and transparency of recruitment practices, the trend is similar, although slightly lower among staff exchanges participants[64] Interviewees pointed to measures such as providing more stable job contracts and improving salary conditions as the MSCA benefits that improved the competitiveness of their organisations the most[65].

Overall, MSCA postdoctoral fellows consider host organisations to be highly committed to improving the stability of researchers' jobs (60%)[66] while noting challenges to keep the MSCA allowances competitive. Since the time of the survey, salaries have already been revised. The need for improved communication on fellowship and grant details before projects commence has also been noted by fellows[67].

Successful applicants regard MSCA projects as an effective means to create or enhance collaborations with leading research organisations. Notably, 89% of MSCA beneficiary organisations[68] believe that their participation in the programme significantly strengthens their relationship with leading research organisations in Europe and beyond. For MSCA postdoctoral fellows, the programme provides ample opportunities for interdisciplinary cooperation[69]. The MSCA continues to successfully attract well-networked organisations with a long-standing tradition of scientific excellence, with the top 1% most networked entities accounting for 29.6% of total participations in the programme, surpassing the Horizon Europe average of 22.1%[70].

Research infrastructures

Research infrastructures (INFRA) supports the roadmap of the European Strategy Forum for Research Infrastructures (ESFRI), outlining the essential RIs needed in Europe for the next 10-20 years. INFRA funds various phases of ESFRI projects, including design studies, preparatory phases, and implementation phases. However, many interviewees and survey respondents consider the existing funding for RI development to be insufficient[71]. Problems with the lack of funding for the maintenance or sustainability of infrastructure reported in the final evaluation of Horizon 2020[72] still persist.

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[60] Ibid. 612 survey respondents.
[61] Ibid. 719 survey respondents.
[62] 51% of 326 DN respondents. 53% of the 112 staff exchange (SE) respondents. 100% of 8 COFUND respondents. Not applicable/unknown and blank responses excluded. Excellent Science evaluation study annexes, p. 310.
[63] 65% of 327 DN respondents. 60% of the 111 SE respondents. 88% of 8 COFUND respondents. Not applicable/unknown and blank responses excluded. Excellent Science evaluation study annexes, p. 310.
[64] 57% of the 333 DN respondents. 48% of the 103 SE respondents and 100% of the 8 COFUND respondents. Not applicable/unknown and blank responses excluded. Excellent Science evaluation study annexes, p. 310.
[65] Excellent Science evaluation study annexes, p. 312.
[66] Ibid, p. 22. 495 survey respondents.
[67] Excellent Science study Phase 2 (HE), Annexes, p. 108. The country correction coefficients, also mentioned by stakeholders, were revised in 2024: https://data.europa.eu/doi/10.2766/344144
[68] 432 survey respondents from MSCA DN, SE and COFUND actions. Excellent Science evaluation study annexes, p. 313.
[69] 77% of 628 survey respondents agree with this statement, Excellent Science evaluation study annexes p. 22. For all MSCA PF applicants: 60%, 1 656 survey respondents.
[70] Ibid, p. 24.
[71] Ibid, p. 28.
[72] SWD(2024) 29 final, pp. 77-78, https://eur-lex.europa.eu/resource.html?uri=cellar:b5a1da8b-be92-11ee-b164-01aa75ed71a1.0001.02/DOC_1&format=PDF

This programme part aims to foster collaboration among RIs and to ensure accessibility for researchers across Europe. Changes made under Horizon Europe include discontinuing integrating activities (INFRAIA) grants and introducing the more challenge oriented INFRASERV grants for the provision of access. INFRASERV topics bring together more heterogenous RIs than INFRAIA and aim to better address societal challenges. Typically, INFRASERV grants integrate two or more past INFRAIA RI communities. For example, the canSERV project[73] integrates more than 130 access providers, including providers from 13 pan-European life sciences RIs to support cancer research. Another example is the AQUARIUS project[74], which supports Mission Ocean by providing free access to a diverse portfolio of European RIs, including research vessels, marine observation platforms, aircraft, drones, satellites and more. Interviewees expressed concerns about these changes, notably the complexity of project coordination, the fragmentation of funding and the sustainability of the services developed beyond the lifetimes of individual projects[75]. Interviewees indicated the need for a longer-term vision for the integration of RIs. However, the full impact of these changes will need to be assessed over a longer period of time.

INFRA plays an important role in the development of the **European Open Science Cloud (EOSC)**. While advances are being made on FAIR data and the creation of new services, interviewees[76] expressed concerns about two issues which are already being addressed:

- The first is the lack of synchronisation between projects, potentially leading to a duplication of efforts and unexploited synergies. To address this, the INFRA work programme includes two topics (in 2021 and 2024) with dedicated activities for coordination among INFRAEOSC projects. The Commission also organises annual 'concertation' meetings of INFRAEOSC projects in order to further support coordination and the development of synergies.
- The second is the discontinuation of dedicated funding for the science clusters. Interviewees consider these clusters to be a key platform through which RIs of the same scientific discipline can collaborate, which in turn enables integration of RI services and data into the EOSC.

Pillar II contributions to Excellent Science

Scientific excellence is a primary evaluation criterion for Pillar II projects.

In addition to the main generators of peer reviewed publications (the ERC and JRC, both detailed above), Pillar II has generated 3 026 peer-reviewed publications. The largest share comes from Cluster 4 (Digital, industry, and space) with 1 453 publications. This is followed by Cluster 1 (Health) with 478 publications, and Cluster 5 (Climate, energy, and mobility) with 420 publications. Cluster 6 (Food, bioeconomy, natural resources, agriculture, and environment) has produced 430 publications. Cluster 2 (Culture, creativity, and inclusive society) and Cluster 3 (Civil security for society) contribute the fewest publications, 130 and 132 respectively. The lower number of publications for Cluster 2 and 3 is consistent with their lower funding expenditure, as together they contribute 5% of the pillar II budget.

Joint Research Centre's direct research actions

According to a bibliometric study[77] that analysed the JRC's publications indexed by Scopus between 2018 and 2022, JRC publications are cited 2.26 times the world average[78], similar to

[73] https://cordis.europa.eu/project/id/101058620
[74] https://cordis.europa.eu/project/id/101130915
[75] Excellent Science study annex, 2024, p. 26, https://data.europa.eu/doi/10.2777/9552959.
[76] Ibid, p. 26.
[77] Costa Dantas Faria, J., Hristova, M.A. and Lehto, S., Bibliometric analysis of JRCs research performance using Scopus-Scival tools 2018-2022, European Commission, 2024, JRC136476.
[78] 2014-2018: 2.34, 2016-2020: 2.27.

prestigious institutions such as the University of Oxford. The results were similar during the Horizon 2020 programming period. Moreover, the JRC publishes in top journals[79], with 45.4% in the top 10% most cited category and 6.6% in the top 1%, showing a significant increase from 37.1% and 2.1% respectively for the first 5 years of Horizon 2020.

Collaboration is a key aspect of the JRC's work, with 82% of publications involving authors from other organisations. Under Horizon Europe, the JRC joined as an associated partner for 32 collaborative projects under Pillars I and II. Of these, it joined 24 projects from Clusters 2, 4, 5 and 6, hosted three doctoral networks and three postdoctoral fellowships under MSCA, and provided research infrastructure in two pan-European research consortia[80].

In addition, a panel of independent experts[81] provided a positive assessment of the JRC, acknowledging its relevance, high-quality work and agility in addressing new challenges. Examples of JRC's expertise in support of policy-making include:

- **The EU digital policies:** JRC studies on technological and organisational enablers for data sharing in the EU informed the Data Act[82], while the estimation of benefits from interoperability informed the impact assessment of the Interoperable Europe Act[83].
- **Monitoring and measuring climate action:** In 2024, the Commission presented its recommendation for a 2040 climate target to reduce net greenhouse gas emissions by 90% relative to 1990 levels, with an impact assessment of possible pathways to reach climate neutrality by 2050[84]. The impact assessment was underpinned by the JRC's quantitative scenario analysis on the policy options.
- **Green Deal industrial plan:** JRC studies on supply chains and recycling potential[85-86] and its Raw Materials Information System[87] were used to track supply and demand for shaping the Critical Raw Materials Act[88]. For the Net-Zero Industry Act, the JRC provided analysis and recommendations on strategic infrastructure investment needs, industrial development and clean tech policies for key strategic net-zero technologies (notably batteries, electrolysers, solar energy, onshore wind and offshore renewables, sustainable biogas and biomethane, carbon capture and storage, heat pumps and geothermal, and grids)[89].

[79] Costa Dantas Faria, J., Hristova, M.A. and Lehto, S., European Commission, Bibliometric analysis of JRCs research performance using Scopus-Scival tools 2018-2022 4, p. 26.
[80] Based on Horizon Dashboard data, R&I organisation profiles https://dashboard.tech.ec.europa.eu/qs_digit_dashboard_mt/public/sense/app/dc5f6f40-c9de-4c40-8648-015d6ff21342/overview
[81] Heuer, R.-D., et al., Interim evaluation of the activities of the Joint Research Centre under Horizon Europe and Euratom 2021-2025 - Final report of the evaluation panel, Publications Office of the European Union, 2023.
[82] SWD/2022/34 final. Reference to JRC: pp. 23, 27, 43, 138.
[83] SWD/2022/721 final. Reference to JRC: pp. 12-13, 18, 21, 33-34, 48-49, 54, 62, 64, 85, 87, 90, 94, 96- 98.
[84] SWD(2024) 63 final. Reference to JRC: Part 1, pp. 10, 52-54, 67-69, 87, 92-95, 122; Part 2, pp. 3-5, 7-12, 15-16, 30, 45-47, 83, 97-98, 100, 109, 120; Part 3, pp. 20, 30, 118-119, 122, 131, 143, 151-153, 193-198, 207-210, 214-216, 218, 232-233; Part 3, pp. 9, 11, 15, 23-24, 36, 52, 58; Part 5, pp. 6.
[85] Carrara, S. et al., Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU – A foresight study, Publications Office of the European Union, 2023.
[86] Tazi, N. et al., Initial analysis of selected measures to improve the circularity of critical raw materials and other materials in vehicles, Publications Office of the European Union, 2023.
[87] https://rmis.jrc.ec.europa.eu/
[88] (i) Proposal for a Regulation COM(2023)160final, p.1; (ii) SWD/2023/161/FINAL, pp.116-117, 160, 173.
[89] (i) Proposal for a Regulation COM (2023) 161 final. Reference to JRC: p. 10; (ii) SWD(2023) 68 final. Reference to JRC: pp.27, 50-58, 74, 76, 103, 109; iii) SWD(2023) 219 final. Reference to JRC: pp. 13, 83, 84 and 94.

4.1.2. Effectiveness: **Towards 'societal impacts'** – To what extent has Horizon Europe increased the R&I contribution to address global challenges (Key Impact Pathways 4-6)?

This section assesses Horizon Europe's contribution to the Key Impact Pathways focusing on societal impact: 'Addressing EU policy priorities & global challenges through R&I'; 'Delivering benefits and impact via R&I missions'; and 'Strengthening the uptake of R&I in society'.

Figure 11 - Societal impacts of Horizon Europe – Key Impact Pathways 4-6

Source: Annex V to Regulation 2021/695

Addressing EU policy priorities and global challenges through R&I (Key Impact Pathway 4)

By mid-2024, beneficiaries mobilised EUR 7.42 billion of their own funds to address SDGs, and EUR 6.08 billion of their own funds to support climate-relevant projects. A total of 9 463 publications were linked to SDGs and 8 827 are climate-relevant in that they support EU policy priorities and address global challenges through R&I. Regarding innovative outputs, 3 570 were linked to SDGs, and 2 893 were climate-related.

Of the projects supported under Horizon Europe, the biggest proportion focused on **SDG3 - Good health and well-being (44%)**, followed by **SDG7 - Affordable and clean energy (24.2%)**, **SDG9 - Industry, innovation and infrastructure (22.9%)**, and **SDG16 - Peace, justice and strong institutions (21%)**[90]**.** Climate action (SDG13) is no longer in the top four, whereas the coverage of SDG3, SDG7 and SDG16 increased so far compared to Horizon 2020 (from 26% to 44%, from 12% to 24%, and from 6% to 21%, respectively)[91].

Effectiveness in contributing to EU policy priorities:

- **Climate action**:
  - The climate contribution of Horizon Europe was 35% by the end of 2023[92]. By comparison, the contribution of the previous framework programme, Horizon 2020, was 32%, falling short of the 35% target[93].
  - 65% of Horizon Europe call topics on climate science in Cluster 5 between 2021 and 2024[94] should contribute to the Intergovernmental Panel on Climate Change (IPCC)'s work by improving climate, adaptation and mitigation knowledge and projections. The results of these projects are not yet available. The previous two framework programmes were identified as the second most frequently acknowledged funding source of the

[90] Innovative Europe external evaluation study, Annex 6.3 on 'Sustainable Development Goals (SDG) Analysis', forthcoming in 2024, p. 400. More detail can also be found in the dedicated section on SDGs in the PPS.
[91] Ibid, p. 401 and 405. The comparison between Horizon Europe and Horizon 2020 is subject to methodological limitations (see Annex 2 of this SWD).
[92] According to the DG BUDG Climate Dashboard data as of 27 January 2025. This is based partly on preliminary estimates and continuous monitoring of Horizon Europe's climate mainstreaming efforts, therefore data is subject to yearly revisions as the programme evolves. The data is currently being revised and might be updated in future Programme performance statements.
[93] SWD(2024) 29 final, p. 22.
[94] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-8-climate-energy-and-mobility_horizon-2021-2022_en.pdf, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-8-climate-energy-and-mobility_horizon-2023-2024_en.pdf

research referenced in the IPCC's 6th Assessment Cycle reports, with over 4 500 publications cited, coming from over 1 200 projects[95].

- Spending on **biodiversity** increased from 7.9% in 2021 to 8.7% in 2023[96]. According to Horizon Europe's legal basis, the programme should contribute to the overall ambition of directing 7.5% of annual spending under the MFF towards biodiversity objectives in 2024 and 10% in 2026 and 2027[97].
- Although there is no specific target determined for spending on **clean air objectives**, the Commission is obliged to report on Member States' uptake of EU funds to achieve the objectives of Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants. From 2021 to 2024, the committed contribution of Horizon Europe to clean air is estimated at EUR 3 762.9 million (4%)[98].
- Horizon Europe investments in the **digital transformation** for 2021-2023 are estimated at up to EUR 14 053.2 million, or 33% of the Horizon Europe budget for these years (compared to 32% under Horizon 2020)[99].
- Horizon Europe investments in **security** (Cluster 3) supported the EU's commitment to ensuring the EU's civil **security resilience** of citizens and critical infrastructure, and establishing a common culture for disaster preparedness[100].

What messages emerged from the stakeholder consultation?
Overall, 60% of respondents (928) agreed or strongly agreed that Horizon Europe supports access to and uptake of innovative solutions by European industry and society to address global challenges, including climate change and the SDGs. This view was held most strongly among business associations (79%; 30), followed by non-EU citizens (70%; 23) and companies (69%; 183). EU citizens agreed to a lesser extent: 55% (105) (strongly) agreed with the statement, corresponding to a 15-percentage point difference from non-EU respondents.

Delivering benefits and impact via R&I missions (Key Impact Pathway 5)

EU Missions, of which there are five, are a new feature of Horizon Europe. They aim to address societal challenges and boost the impact of the programme. Following the submission of reports[101] from the five Mission Boards, they were launched in September 2021 in the form of a Commission Communication[102]. Since then, the Missions have developed activities funded through three Horizon Europe work programme parts (2021-2023), accounting for 10% of the Pillar II budget.

Projects related to EU Missions have led to 33 peer-reviewed scientific publications and 1 intellectual property rights (IPR) output. A total of 87 innovative products, processes, and methods have been developed under the projects. In addition, in 38 mission projects (representing 66.7% of the total), citizens or end-users were involved in the co-design of R&I content (compared to 48.7% programme-wide, reported below under KIP 6).

In January 2024, the Commission expert group supporting the monitoring of EU Missions found that 'faster and deeper integration of Missions with national systems and processes has occurred in cases where the Mission's objectives are closely aligned to pre-existing European and national policy strategies, and when the introduction of EU Missions has overlapped with national policy

[95] SWD (2024) 29 final on the *ex post* evaluation of Horizon 2020, p. 39.
[96] Horizon Europe programme statement, quoted in COM(2024) 231 final
[97] Regulation (EU) 2021/695, recital point 76.
[98] Clean air overview 2024, from June 2024, https://commission.europa.eu/document/download/52cb8a30-ab44-4973-8776-1b97f74bb503_en?filename=Budget%20contribution%20-%20clean%20air_0.pdf
[99] Ibid. Tracker based on the *intent* of the action.
[100] Resilient Europe evaluation study, 2024, p. 52. https://data.europa.eu/doi/10.2777/797281
[101] https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/foresight-reports-missions-horizon-europe_en
[102] COM(2021) 609 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0609

planning cycles. In terms of concrete actions, most countries are at the early stages in their contributions to EU Missions'[103]. For the evaluation at hand, the Mission secretariats provided data on progress towards their goals:

As of the end of 2024, the EU Mission **'Restore our ocean and waters by 2030'** is supporting 225 demonstration sites to prepare the ground for the uptake by national and regional actors of the proposed solutions:

- 122 demo sites in projects selected/running under Specific Objective 1 on marine protection and restoration, and restoration of inland waters.
- Another 55 demo sites in projects selected/running under Specific Objective 2 on preventing and eliminating pollution (microplastics, nutrients and chemicals).
- 29 demo sites in projects selected/running under Specific Objective 3 on greenhouse gas emissions from maritime economic activities in the EU, zero-carbon and low impact aquaculture, low-carbon multi-purpose use of marine and water space.
- 19 demonstrators in projects selected/running that contribute to the development of the 'digital twin ocean', a multi-dimensional and near real-time virtual representation of the ocean. The digital twin combines ocean observations, artificial intelligence, and advanced modelling operating on high-performance computers, and is accessible to all[104].

These results are available on the Mission Ocean and Waters Monitoring dashboard[105].

The Mission 'A Soil deal for Europe' (Mission Soil) aims to '*establish 100 living labs and lighthouses leading the transition towards healthy soils by 2030*'. The first 25 living labs have been set-up. The encompass around 250 real-life testing sites and involve 167 partners, 25% of which are from private sector, in 11 Member States. They take a bottom-up research approach that is place-based and collaborative, engaging stakeholders to address specific soil health needs and challenges in real-world settings. Although the list of living labs and lighthouses has not been published, numbers were provided by the Mission secretariat for this evaluation. Similar or higher numbers are expected under current and future annual work programmes. High-performing living labs sites will be designated as 'lighthouses' on a rolling basis, starting in 2025, based on criteria from the Mission implementation plan (undergoing refinement)[106].

Mission Soil has also contributed to key EU policies, including the proposal for a directive on soil monitoring and resilience. A key tool for such policy support is its Soil Health Dashboard[107], launched in March 2023, which provides an overview of soil health in the EU using 19 indicators. It covers the whole EU territory and covers some of those indicators for the first time (i.e. concentrations of heavy metals).

The Mission '100 Climate-Neutral and Smart Cities by 2030' has also made progress:

- In 2022, 100 cities[108] from 27 MS were *selected* to participate in the Cities Mission, as well as 12 cities from associated countries (out of a total of 377 interested cities)[109].

[103] Karo, E., Barajas, A., Sarvaranta, L. et al., Final report of the Commission expert group to support the monitoring of EU missions, Publications Office of the EU, 2024, p. 7. https://data.europa.eu/doi/10.2777/076494
[104] https://digitaltwinocean.mercator-ocean.eu/
[105] https://projects.research-and-innovation.ec.europa.eu/en/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters/monitoring-dashboard
[106] European Commission, Mission Soil implementation plan, pp. 31-32, and Annex D, p. 74. https://mission-soil-platform.ec.europa.eu/sites/default/files/2023-07/soil_mission_implementation_plan_final_for_publication.pdf
[107] https://esdac.jrc.ec.europa.eu/esdacviewer/euso-dashboard/
[108] EU missions, 100 climate-neutral and smart cities – Cities on a journey to climate neutrality, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/169604
[109] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/climate-neutral-and-smart-cities_en

- By October 2024, 53 of these cities[110] had received the *Mission label*, meaning that their 'climate city contracts' were completed and assessed positively by the Commission.
- In addition to those with climate city contracts, 104 participating cities[111] are exploring innovative approaches to accelerate their climate transitions with funding from a pilot programme.
- As of November 2024, no cities have been designated by the Mission as climate neutral and smart. Cities with a Mission label have 5-6 years to work towards becoming climate neutral and smart[112] along the lines set out in their climate city contracts.

The Mission on adaptation to climate change is progressing towards its goal of 'supporting 150 European regions and communities becoming climate resilient by 2030':

- As of November 2024, the Mission is supporting 145 regions in accelerating their adaptation efforts. Of these, 32 regions are receiving financial support to assess their climate risk, 40 are receiving financial support to develop their pathways to climate resilience, 58 are receiving technical assistance to develop their adaptation plans, and 18 have already received the fill range of support.
- 200 regions / local authorities are participating in projects funded by the Mission. Of these, 162 are participating in projects where they test and demonstrate innovative adaptation solutions. For example, the CLIMATEFIT project[113] helps Mission participants to develop investment strategies and mobilise financial resources.

Although the list of regions and communities has not been published, the Mission secretariat provided the figures for this evaluation.

The Mission has produced guidance[114], tools[115], and data[116], and has supported the implementation of innovative solutions[117,118,] Much of the support is provided on the Climate ADAPT portal and through the Mission Adaptation Community[119]. For example, participating as a leading demonstration site in the ARCADIA project[120] enabled the region of Emilia-Romagna (Italy) to exchange information with other regions, raise awareness among local policymakers about climate adaptation, and explore improvements to its water network management[121].

The EU Cancer Mission's goal is to '**improve the lives of more than 3 million people by 2030 though prevention, cure and for cancer patients, including their families, to live longer and better'**. While the number of people whose lives have been improved cannot yet be reported, progress towards the goal is as follows:

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[110] https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_23_4879/IP_23_4879_EN.pdf, https://managenergy.ec.europa.eu/managenergy-discover/news/23-cities-awarded-eu-mission-label-their-efforts-towards-climate-neutrality-2024-04-08_en and https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/commissioner-ivanova-hands-over-eu-mission-label-20-cities-2024-10-22_en

[111] https://netzerocities.eu/pilot-cities-programme/

[112] According to the JRC definition. https://research-and-innovation.ec.europa.eu/document/download/cb258381-77d5-435a-8b25-9a590795dc9e_en?filename=ec_rtd_eu-mission-climate-neutral-cities-infokit.pdf

[113] https://cordis.europa.eu/project/id/101112705

[114] E.g. with the Funding and Financing Guide. https://climate-adapt.eea.europa.eu/en/mission/funding/guide

[115] E.g. Stakeholder and Citizen Engagement in Climate Adaptation: A DIY Manual

[116] E.g. Regional Adaptation Support Tool

[117] Adaptation Stories and Mission Case Studies showcase real-life examples of regional or local actions and good practices regarding the planning, funding, implementing and monitoring of climate adaptation solutions.

[118] https://climate-adapt.eea.europa.eu/en/mission/solutions/mission-stories/natural-playgrounds-and-schoolyards-story17

[119] https://futurium.ec.europa.eu/en/eu-mission-adaptation-community

[120] https://cordis.europa.eu/project/id/101112737

[121] https://climate-adapt.eea.europa.eu/en/mission/solutions/mission-success-stories?activeAccordion=b88b1f74-8e1e-4dad-853b-eeae4ddbbda7; More examples and details are available in the Mission Stories

- the ECHoS project[122], which involves 60 partners from all EU Member States and three associated countries, is creating a network of national cancer Mission hubs through stakeholder engagement and cross-policy dialogue.
- The Mission supports the revised Council Recommendation on cancer screening[123] by helping develop innovative, less invasive and more accessible methods and technologies for cancer screening. It also supported a pilot roadshow in Lithuania, Poland and Romania to raise awareness about cancer prevention and screening, which had 16 804 visitors[124].
- A dialogue with young cancer survivors from all over Europe was organised, which resulted in a new research topic being added to the 2024 Cancer Mission work programme on 'late-effects of treatment in adolescent and young adult (AYA) cancer patients and survivors' (budget: EUR 36 million). A complimentary study on the provision of AYA care in Europe is being supported by the 2024 EU4Health programme[125].
- Support for 20 international clinical trials which use participative research to optimise affordable personalised diagnostic and therapeutic interventions. The trials involve over 3000 patients with difficult-to-treat cancers and aim to integrate successful interventions into national healthcare systems by 2030.

Mission Cancer is currently setting up its monitoring system so it can effectively measure progress towards its goal of improving the lives of more than 3 million people by 2030 through prevention, cure and solutions to live longer and better. However, it faces the challenge of defining 'improving lives' in the context of a disease that may return after treatment.

What messages emerged from the stakeholder consultation?

When asked about the **effectiveness of EU Missions compared to regular collaborative research**, 30% of respondents said they were 'somewhat' or 'to a great extent' more effective (491 out of 1663 respondents).

However, only **20% of respondents are (very) satisfied with the EU Missions' progress towards their objectives so far** (325). The most satisfied stakeholder groups are public authorities (24%; 21) and academia (21%; 174). At the other end of the spectrum, 12% are (very) dissatisfied (196), with the most dissatisfied stakeholder groups being NGOs (18%; 13), public authorities (16%; 14) and academia (14%; 115).

EU Missions' governance

The process for designing all five EU Missions was participatory, open and transparent, despite challenges with conducting consultations caused by the COVID-19 pandemic[126]. The regulation establishing Horizon Europe called for Missions to 'be bold and inspirational', with 'wide, scientific, technological, societal, economic, environmental or policy relevance and impact'[127]. Their goals were further developed at the political level in diverse ways.[128]

The Missions' implementation plans include *possible* impact-level indicators[129] but their monitoring and evaluation framework has not been finalized, despite the fact that the regulation establishing Horizon Europe stipulated that "The missions, their objectives, budget, targets,

[122] https://cordis.europa.eu/project/id/101104587
[123] https://data.consilium.europa.eu/doc/document/ST-14770-2022-INIT/en/pdf
[124] Details are available on the Cancer Mission implementation page
[125] For further information please consult https://hadea.ec.europa.eu/news/eu4health-prior-information-notice-exploratory-study-provision-care-adolescent-and-young-adult-aya-2024-07-16_en
[126] SWD(2023) 260 final on the assessment of EU Missions, p. 11 for Mission Climate Change Adaptation, p. 34 for Mission Cancer, pp. 59-60 for Mission Ocean and Waters, p. 87 for Mission Cities, pp. 108-109 for Mission Soil, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023SC0260
[127] Regulation (EU) 2021/695, Art. 8. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R0695
[128] Goals were further specified after they were laid out in the Horizon Europe regulation.
[129] Table 1 in the implementation of the Mission on Climate Change Adaptation, p. 36 in the Mission Cancer implementation plan, p. 51 of the Mission Ocean and Water implementation plan, illustrative examples on p. 43 in the Mission Cities implementation plan, proposed indicators on p. 69 of the Mission Soil implementation plan.

scope, indicators and milestones shall be identified in strategic R&I plans or the work programmes"[130].

In the 2023 assessment of Missions, many stakeholders reported that their **governance process is 'cumbersome, complex and lacking transparency'**[131]. While acknowledging the differences between the Missions' governance, the Commission committed to make the EU Missions more effective for example by:

- intensifying discussion with political actors, notably Member States, on how to streamline their governance to make it more efficient, inclusive, and effective;
- mobilising a broader portfolio of instruments to secure greater participation of the private sector, including public-private partnerships and the public procurement of innovation;
- carrying out targeted actions to support local and national communication efforts to boost citizen engagement and raise awareness about EU Missions.

Since the 2023 assessment, the relevant Commission departments have strengthened the governance processes by reinforcing the horizontal steer and coordination of the EU Missions. More specifically, they engaged with Member States through the *mutual learning exercise (MLE)* of the Policy Support Facility. In addition, the Mission Boards' terms of reference (ToR) were updated in 2024 to improve coordination mechanisms and ensure strategic alignment with EU-wide and local objectives.

Governance issues were also flagged in the evaluation of Focus Areas – a pilot initiative under the predecessor programme, Horizon 2020. The evaluation remarked that Focus Areas were added as an extra layer of cooperation, within a policy mix already suffering from 'increasing complexity and fragmentation'[132].

What messages emerged from the stakeholder consultation?

More than half of respondents to the consultation consider that the **creation of EU Missions** contributes **somewhat or to a great extent** to strengthening the impact of European R&I (52%; 813).

Public authorities feel the most favourably about the EU Missions, with 56% (49) agreeing with the statement that the creation of the EU Mission contributes somewhat or to a great extent to strengthening the impact of EU R&I, followed by EU citizens (52%; 105) and companies (50%; 138). Non-EU citizens were less favourable, with 42% (105) agreeing or strongly agreeing that the EU Missions help strengthen impact. Only business associations were less favourable (37%; 18).

Only 6% (95) of the respondents consider that the creation of the EU Missions does **not at all** contribute to strengthening the impact of European R&I.

Strengthening the uptake of R&I in society (Key Impact Pathway 6)

A total of 1 636 projects (or 49% of the projects that provided such information by 6 January 2025) have EU citizens or end users involved. This is a new indicator in Horizon Europe: comparable figures for Horizon 2020 are only available for civil society engagement, reported in just 2.9% of projects as of 31 March 2017.

The inclusion of citizens and stakeholders and co-design aspects are emphasised in EU Mission projects (67% of their projects report this type of engagement, compared to 49% programme-wide). Some examples include:

[130] Regulation (EU) 2021/695, Art. 8. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R0695
[131] COM(2023) 457 final, p. 9, https://mission-soil-platform.ec.europa.eu/resource-library/communication-commission-eu-missions-two-years-assessment-progress-and-way-forward
[132] SWD(2024) 29, p. 76. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52024SC0029

- The first European Mission Soil Week in 2023 brought together over 300 in-person and 600 online participants, including key stakeholders, researchers, and policymakers, to discuss the importance of soil health. Launched in April 2023, the Mission Soil manifesto now has 3400 signatories, including more than 600 legal entities and a growing number of local and regional authorities.
- The EU Mission on adaptation to climate change organised 27 community-level events in the regions and local authorities involved in the Mission, and 21 regions / local authorities have received technical assistance to engage citizens and stakeholders.
- the EU Cancer Mission held a dialogue with over 100 young cancer survivors from across Europe, to better understand the challenges they face during and after cancer treatment. It has brough young cancer patients and survivors on board to co-create initiatives[133] that will help address their physical and mental well-being, follow-up care, continuity in education etc.

Horizon Europe clusters

This section provides a few, illustrative examples of Pillar II projects per cluster, but is not exhaustive[134]. The work programmes did not provide indicators or targets to assess progress towards the expected outcomes and impacts. Given the early stage of programme implementation (only 6.6% of projects were closed on 6 January), the evaluation can only present examples of outputs.

Under the health cluster (Cluster 1), the CLIMOS project[135] involved collaboration on an indicator for climatic suitability conditions for leishmaniasis[136] (a parasitic tropical disease caused by sandflies, deadly in around 8% of the 700 000 to 1 million new cases each year). This cross-project effort resulted in a machine learning modelling approach that has been applied to predict the climatic suitability for this disease across several regions. Several countries can therefore prepare for the climate change-related arrival of a devastating disease.

Horizon Europe also funds **digital health solutions**, as demonstrated by XpanDH[137] - a project that aims to speed up the adoption of the European electronic health record exchange format (EEHRxF) across the EU by mobilising and building capacity in individuals and organisations, enabling citizens to easily access and share their health data with healthcare professionals. Another project, MELISSA[138], which brings together experts in diabetes, AI, behavioural sciences, and clinical trials, among others, – is developing an AI-based digital diabetes management solution that provides personalised treatment and care recommendations. AI approaches are used to adjust daily insulin treatment in line with real-time glucose fluctuations.

Cluster 2 – **Culture, creativity and inclusive societies** supports research aimed at strengthening European democratic values, including rule of law and fundamental rights. For example, ITHACA[139] is developing and testing a human-centric AI and ethics-by-design online discussion platform for civic participation in local governance, integrating human and social interpretations

[133] 2024 EU Cancer Mission call, topic 05: Improving the understanding and management of late-effects in adolescents and young adults (AYA) with cancer (RIA) - European Commission (europa.eu)
[134] The highlighted projects stem from the 'feedback to policy' mechanism and were identified in January-March 2024 through the network of coordinators and contact points. Feedback to policy bridges policy work and research stemming from Horizon Europe via collaborative channels and work between policy DGs and executive agencies.
[135] https://climos-project.eu/; https://cordis.europa.eu/project/id/101057690
[136] The indicator is expected to be part of the Lancet Countdown Europe Report for 2024 (due in May 2025) and will be made available to public health professionals and decision-makers as part of the European Climate and Health Observatory.
[137] https://cordis.europa.eu/project/id/101095594
[138] https://cordis.europa.eu/project/id/101057730
[139] https://cordis.europa.eu/project/id/101094364

into the design, to ensure that AI decision-making processes are explainable, transparent and fair and consider the needs of vulnerable groups.

Cluster 3 initiatives address security threats, disaster management, and crisis response. They enable the development of security solutions in real environments by involving security practitioners and citizens[140]. Horizon Europe contributes to **border security** through projects such as MELCHIOR[141] and ODYSSEUS[142] aimed at making border control checks more efficient and ethical thanks to advanced, non-intrusive technologies. MELCHIOR, which builds on the success of the Horizon 2020 project MESMERISE[143], is further developing and demonstrating a novel technology based on infrasound waves for detecting drugs, explosives, weapons, and illicit goods concealed on individuals and in body cavities. ODYSSEUS uses a combination of portable unobtrusive screening technology, drone-assisted image processing, and AI-based data analytics to enable border authorities to remotely validate identities and check vehicles, luggage or cargo, while enhancing the travel experience for EU and non-EU citizens.

Horizon Europe also supports **disaster resilience** in Cluster 3 through initiatives such as DIREKTION[144], which follows up on the Horizon 2020 project Fire-IN[145]. The project promotes an EU-wide network of fire and rescue practitioners, evaluating emerging technologies, and fostering collaboration between various stakeholders to address challenges related to climate change, ageing infrastructure, and geopolitical instability. Under Cluster 3, Horizon Europe also funds efforts to improve **cybersecurity**, e.g. the CS-AWARE-NEXT[146] project, which focuses on improving cybersecurity management for organisations and local supply networks by providing advanced AI-based threat intelligence integration, supporting compliance with European legislation, and enhancing internal and external cooperation.

Through its targeted investments, **Cluster 4** has not only contributed to immediate research advances but has also laid the **groundwork for an EU positioning in key technology areas** contributing to the digital and industrial transition, such as quantum computing, space and advanced materials. However, and even though the patent profiles of Cluster 4 researchers show the appropriate specialisation in all KETs, patent filing trends from EU-27 countries have remained stable since FP7, while the EU global patent shares in most KETs[147] have been declining[148].

Through projects like IRISS[149], the programme supports the development and implementation of **sustainable and safe materials**. With a specific focus on SMEs, IRISS aims to help industries utilise safe and sustainable-by-design materials (SSbDs) via a state-of-the-art ecosystem. Cluster 4 also funds the development of **advanced materials** such as high-performance composites (HPCs) whose applications are currently hindered by long processing times, high costs, and low recyclability. The r-LightBioCom project[150] proposes a paradigm shift in the way HPCs are manufactured and recycled, unlocking sustainable-by-design production of lightweight HPCs.

[140] Resilient Europe evaluation study, 2024, https://data.europa.eu/doi/10.2777/797281, p. 46
[141] https://cordis.europa.eu/project/id/101073899
[142] https://cordis.europa.eu/project/id/101073910
[143] https://cordis.europa.eu/project/id/700399
[144] https://cordis.europa.eu/project/id/101121249
[145] https://cordis.europa.eu/project/id/740575
[146] https://cordis.europa.eu/project/id/101069543
[147] Including advanced manufacturing, advanced materials, life-science technologies, micro/nano-electronics and photonics, artificial intelligence, security and connectivity, https://research-and-innovation.ec.europa.eu /key-enabling-technologies_en
[148] Digital & industrial transition evaluation study – Conclusions, 2024, https://data.europa.eu/doi/10.2777/845650.
[149] https://cordis.europa.eu/project/id/101058245
[150] https://cordis.europa.eu/project/id/101091691

The project seeks to enable new circular value chains by reducing HPC waste generation and reliance on non-sustainable energy sources.

To respond to Europe's need for a new generation of batteries that are durable, safer and sustainably manufactured, the framework programme invests in projects such as TEMPEST[151]. Supported **under Cluster 5**, the project aims to develop high-performance, lightweight, and recyclable batteries for various transportation applications. Its approach involves advanced chemistry and AI with the aim of optimising battery systems with integrated health monitoring and thermal management.

In addition, the European Green Deal relies on continuous input from the scientific research community to ensure it is implemented effectively and based on the latest evidence. By providing better understanding on how the climate system works and how it will change over time, climate science is fundamental for making informed and wise decisions about reducing emissions and adapting to a changing climate[152]. For example, the Cluster 5 projects TipESM[153] and ClimTip[154] bring together scientists from a range of disciplines boost our understanding of climate tipping points on our planet - including their impact on ecosystems and society and to develop a set of early warning indicators and safe future emission pathways that minimise the risk of exceeding these dangerous thresholds and increase societal preparedness.

Cluster 6 supports the development of innovative circular solutions that will be crucial to halting environmental degradation and accelerating the transition to a competitive circular economy in Europe. For example, **the CISUTAC project**[155] is increasing circularity and sustainability in the textiles and clothing sector. It does so by demonstrating the feasibility and value of repair and disassembly, as well as sorting for reuse and recycling, and the creation of circular garments through 'fibre-to-fibre' recycling and design for circularity regarding two material groups of textiles fibre materials (polyester and cotton).

Innovation in aquaculture is also funded under Cluster 6. For example, the **Aquaponics from WAstewater REclamation (AWARE)** project[156] is investigating to grow fish in recycled water. The project hereby aims to farm fish for human consumption in any city, with no impact on natural habitats and no dependence on natural freshwater availability.

EU-funded research is a key contributor to the **Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES)**[157]. For example, EU-funded projects have provided knowledge on pollinators that was taken up in the IPBES reports and in turn sparked policy action that addresses knowledge gaps on pollinators[158]. Pollinators such as bees and butterflies are a key group of animals that plays a crucial role in maintaining global food security and ecosystems health and that is essential for biodiversity and human well-being. A key Horizon Europe-funded projects in this area is RestPoll[159], that proposes a holistic approach to pollinators habitat restoration through an innovative network of demonstration cases and living labs that engage not only experts but also others stakeholders to achieve solutions combining cutting-edge research, participatory planning and new business models.

[151] https://cordis.europa.eu/project/id/101103681
[152] European Commission: DG for Research and Innovation, EU research & innovation – Top funder of leading climate science, Publications Office of the European Union, 2023. https://data.europa.eu/doi/10.2777/40193
[153] https://cordis.europa.eu/project/id/101137673
[154] https://cordis.europa.eu/project/id/101137601
[155] https://cordis.europa.eu/project/id/101060375
[156] https://cordis.europa.eu/project/id/101084245
[157] https://op.europa.eu/en/publication-detail/-/publication/4cff1a99-42fd-11ee-a8b8-01aa75ed71a1/language-en
[158] https://op.europa.eu/en/publication-detail/-/publication/4846a018-cd83-11eb-ac72-01aa75ed71a1
[159] https://cordis.europa.eu/project/id/101082102

Impacts of institutionalised European partnerships

The legal base for joint undertakings sets out various possible impacts[160] and each JU contributes to one or more of these pathways:

- According to each of their evaluations, all JUs (see annexes) have helped to create and diffuse high-quality new knowledge and skills, through publications, patents, technological solutions, cooperation and knowledge transfer. They have also helped to harmonise regulations and standards across Member States and between other actors.
- All JUs also reported some contribution to the EU's global leadership and value chain resilience in key technologies. Some had more tangible effects than others. For example, the Chips JU (previously ECSEL/KDT) strengthened the European electronic components and systems (ECS) industry by driving innovation and advances in semiconductor manufacturing, and improving the resilience of its technology value chains, particularly in strategic sectors like mobility, health, and environmental technologies[161]. The Clean Hydrogen JU was instrumental in advancing electrolyser technology and scaling up capacity from 100 kW in 2011 to 10 MW by 2017 and 30 MW in 2023. This JU has ensured that Europe remains a leader in hydrogen fuel cell buses and refuelling infrastructure. Projects like JIVE and JIVE 2 made it possible for fuel cell electric buses to be running in 22 European cities[162].
- Several JUs contributed to developing and accelerating the uptake of innovative solutions. For example, IMI2/IHI JU projects made a practical contribution to the fight against COVID-19, supported an approved vaccine for Ebola virus disease[163] and a new antibiotic for difficult-to-treat infections[164], provided insights into the genetics of Alzheimer's disease, and identified biomarkers associated with diabetes development[165]. The world's second malaria vaccine (R21) was developed through clinical studies supported by the Global Health EDCTP JU, receiving the WHO recommendation for global use in 2023[166].
- Moreover, the EMPIR (institutional) partnership[167] supported research that contributed to the revision process of for of the seven base units for the International System of Units in 2019, linking them to fundamental constants of the universe, addressing the related measuring challenges[168].

Data on the EIT KICs is presented below in the section on that specific topic.

[160] Objectives in Art. 4 of the Council Regulation (EU) 2021/2085. Art. 171 stipulate that the evaluation 'shall examine how each JU fulfils its mission and objectives, cover all activities of the JU and evaluate the JU's European added value, effectiveness, efficiency, including its openness and transparency, relevance of the activities pursued and their coherence and complementarity with relevant regional, national and Union policies, including synergies with other parts of Horizon Europe, such as missions, clusters or thematic or specific programmes. The evaluations shall take into account the views of stakeholders, at both European and national level and shall, where relevant, also include an assessment of the long-term scientific, societal, economic and technological impacts of the JUs'.
[161] Annex on the evaluation of ECSEL / KDT / Chips JU.
[162] Annex on the evaluation of Clean Hydrogen / FCH JU.
[163] EBOVAC, https://cordis.europa.eu/project/id/115854
[164] https://ec.europa.eu/newsroom/sante/newsletter-archives/52538
[165] Annex on the evaluation of IMI2 / IHI, pp.1-2.
[166] Annex on the evaluation of Global Health EDCTP.
[167] Decision (EU) 2021/2084
[168] Annex on the evaluation of EMPIR / EPM, p. 2.

Visibility, transparency and phasing-out of European Partnerships

Horizon Europe introduced new criteria for evaluating partnerships[169]. This section focuses on their (a) international positioning and visibility as global ambassadors for European research and innovation, (b) openness to new participants and transparency of stakeholder involvement, and (c) phasing out preparedness. In addition, an analysis of the partnerships' directionality is presented under the chapter on relevance below, while the partnerships' additionality is assessed under EU added value.

On **international positioning and visibility**, the European Partnerships' approaches have varied depending on their strategic objectives. According to the Biennial Monitoring Report survey, 23 Partnerships have allocated a budget to establish collaborations with partners outside the EU. However, their approaches vary significantly:

- European-centred partnerships, which focus primarily on European initiatives (e.g. EIT Urban Mobility, Circular Bio-based Europe, Single European Sky Partnership, Driving Urban Transition, InnoEnergy, European Partnership for an Industrial Battery Value Chain, People-centric sustainable built environment - Built4People), either have no international exposure or involve limited efforts to connect with stakeholders outside the EU. Any connection with non-EU stakeholders has mostly been made during international conferences.
- Global-oriented partnerships, which require the involvement of international partners to achieve their objectives (e.g. Global Health EDCTP3, Biodiversa +, Innovative Health Initiative, Water4All), focus on international collaboration aligned with the SDGs and EU policy priorities, such as the AU-EU Innovation Agenda, and are active in the relevant global fora.

Despite their efforts, partnerships' external evaluations identified the following obstacles: lack of sufficient financial resources to engage effectively with international partners[170], concerns about the competitiveness of European industry[171], geopolitical issues and demands for technological sovereignty[172], and the absence of a well-defined strategy for international collaboration[173].

SESAR 2020 and SESAR 3 acting as ambassadors for European air traffic management practices globally

SESAR 3 engages in bilateral cooperation with international partners such as the US Federal Aviation Administration under the EU-US Memorandum of Cooperation, focusing on the modernization and global interoperability of air traffic management (ATM). SESAR 3 has also established cooperation with Singapore, Qatar and the UAE, highlighting strategic aviation partnerships. By cooperating with Japan and supporting the EU Aviation Safety Agency (EASA), SESAR 3 plays a major role in advancing global ATM modernisation and aligning with International Civil Aviation Organisation (ICAO) standards.

Europe's success in the aviation and ATM industry is bolstered by its contribution to global standards through ICAO, aligning the European ATM Master Plan with ICAO's Global Air Navigation Plan (GANP).

[169] Art. 171 (point 4) of the Council Regulation (EU) 2021/2085 establishing the joint undertakings under Horizon Europe, as well as Art. 50 and point 4 in Annex III to the Regulation 2021/695 establishing Horizon Europe.
[170] Co-programmed partnership external evaluation report Processes4Planet CP (P4P), Section 4.4.
[171] Co-programmed partnership external evaluation report Made in Europe (MiE), Section 4.4.
[172] Smart network and services (SNS) external evaluation report, Section 4.8, 2024. https://data.europa.eu/doi/10.2777/7895247.
[173] ECSEL & Key Digital Technologies JU external evaluation report, Section 4.8, 2024. https://data.europa.eu/doi/10.2777/71518.

On **transparency and openness**, according to the data collected by the BMR survey[174], the number of new organisations involved in the partnerships increased slightly between 2022 and 2024. Most of the 308 new organisations are associated with the EIT KICs[175], while the other institutionalised partnerships have attracted fewer newcomers[176]. In addition, the partnerships extended to 55 countries in 2022 to 54 in 2024, demonstrating their significant reach beyond European borders. Several new countries have joined, including Australia, Brazil, Egypt and Georgia. Participation from widening countries has increased from 840 to 1 070 members, with some countries experiencing a significant rise of around 30% in the number of participating institutions[177].

However, challenges with attracting participants persist, especially due to the co-funding requirements[178] and membership fees[179]. In particular, some partnerships such as the Circular Bio-based Europe, Made in Europe and BATT4EU struggle to attract organisations from Central and Eastern Europe[180]. The share of SME members increased more than that of universities and private organisations between 2022 and 2024, primarily because of their participation in the EIT KICs. Only three JUs reported SME as members (SNS, Clean Aviation, Single European Sky)[181].

On **phasing-out preparedness**, all EIT KICs have in place a phasing-out strategy to become financially sustainable after 15 years of operation. Only three other institutionalised partnerships have adopted a phasing-out plan which was required by the end of 2023[182] (Single European Sky ATM Research 3, Global Health EDCTP3 and Europe's Rail). EIT InnoEnergy[183], EIT Digital[184], and EIT Climate-KIC[185] reached the end of their partnership status in December 2024, and continue their activities without structural EIT funding. The EIT has signed a Memorandum of Cooperation offering these three KICs targeted, project-based funding through calls for proposals for education and training activities, that are more difficult to self-finance. In 2023-2024, the EIT grants represent 25% of the EIT InnoEnergy budget, 25% of the EIT Climate budget and 27% of the EIT Digital budget. Data for 2025 is not yet available.

What messages emerged from the stakeholder consultation?

49% of the 435 respondents either "agreed" or "strongly agreed" that the exercise to rationalise European Partnerships led to them producing more solutions for the benefit of society, the environment and the economy – this point of view was held most by business associations (39%; 15), companies (34%; 89) and academia (30%; 243). On the other hand, 9% of respondents (146) either "disagreed" or "strongly disagreed" with this statement, with the highest levels of disagreement among NGOs (17%; 12), EU citizens and respondents from academia (10%; 21 and 80 respectively).

[174] European Commission, Biennial monitoring report (BMR) on partnerships in Horizon Europe, 2024, p. 34. https://data.europa.eu/doi/10.2777/991766.
[175] Ibid, p.34.
[176] Digital & Industrial Transition evaluation study, 2024, Annex I, p. 45. https://data.europa.eu/doi/10.2777/489648
[177] European Commission, BMR, 2024, p. 35. https://data.europa.eu/doi/10.2777/991766.
[178] For example, in PARC, the lower funding rate requires more national co-financing. European Commission, Evaluation support study on Horizon Europe's contribution to a Resilient Europe – Final Report Phase 2, Publication Office of the European Commission, 2024, Annexes-case study 15, section on EU added value.
[179] In EIT Digital, the membership fee increased by 30% between 2022 and 2024. Institutionalised partnership evaluation report EIT Digital. https://data.europa.eu/doi/10.2777/431739
[180] Evaluations of the Circular Bio-Based Europe JU, Section 5.9. https://data.europa.eu/doi/10.2777/636121, co-programmed partnership Made in Europe, Section 4.5, and the partnership for Batteries (BATT4EU), Section 4.8.
[181] European Commission, Biennial monitoring report (BMR), 2024, p. 34. https://data.europa.eu/doi/10.2777/991766
[182] Article 17, Council Regulation 2021-2085 (Single Basic Act). Co-funded Partnerships, whose financing depends on a grant agreement of limited duration, are not required to produce a phasing-out strategy.
[183] Evaluation of the EIT InnoEnergy Partnership, Section 6.10, 2024. https://data.europa.eu/doi/10.2777/5626827.
[184] Digital & Industrial Transition study. Annex I, 2024, Section 3.10. https://data.europa.eu/doi/10.2777/489648
[185] Evaluation of the EIT Climate-KIC, Section 3.10, 2024. https://data.europa.eu/doi/10.2777/1601692

Overall, the responses on European Partnerships (co-programmed, co-funded and institutionalised) show that a majority of respondents (53%; 825) are either "very satisfied" or "satisfied" with this type of support.

When probed about the level of satisfaction for the various types of support, excluding respondents who selected "I do not know / I have not used it", of all types of support, **co-funding**[186] yielded the most responses of "dissatisfied" or "very dissatisfied" (22%; 204). Dissatisfaction rates were higher among public authorities (32%), NGOs (29%) and academic and research organisations (24%) than among companies and business organisations (9%) or business associations (12%).

Notably, when breaking down stakeholder responses by Cluster[187], we see that 73% of Cluster 4 respondents (417), 72% of Cluster 5 respondents (454) and 68% of Cluster 3 respondents (220) deem European Partnerships effective compared to regular collaborative research projects in achieving Horizon Europe's objectives.

In view of the change from Horizon 2020 to Horizon Europe, 53% of all stakeholders (825) maintained that the **new approach to partnerships** (co-programmed, co-funded and institutionalised) contributed to strengthening the impact of European research and innovation. Most supportive of the new approach to partnerships are business associations (74%; 29), non-EU citizens (60%; 21) and companies (58%; 154)[188].

Social sciences and humanities (SSH)

Under Horizon Europe, SSH[189] activities are implemented by: (1) mobilising multidisciplinary SSH expertise in Cluster 2, focusing on democracy, governance, cultural heritage and socio-economic transitions; and (2) making SSH a cross-cutting priority in order to boost the Programme's economic and societal impacts – a commitment now set in its legal base, building on the systematic integration first initiated under Horizon 2020[190]. In 2025, the first SSH integration monitoring report for Horizon Europe will provide an analysis of the funding attributed in 2021-2024 to SSH-flagged topics and the level of SSH integration achieved through the programme so far. As of August 2024, SSH-flagged topics account for 27.3% (665 out of 2 432 topics), while SSH projects account for 9.5% (1 363 out of 14 423 total funded projects).

Although progress has been made on the integration of SSH and funding of related research, position papers submitted to the Horizon Europe public consultation by stakeholders flagged concerns such as insufficient early engagement of SSH researchers in the preparation of the work programme and call across all clusters, difficulties in identifying funding opportunities due to overly prescriptive work programmes, and the use of the TRL scale in certain topics.

In the same consultation, certain respondents expressed that, although social science specialists are involved in the consortia, SSH methodologies are not always integrated into the project overall. Moreover, over 40% (889) of the respondents believed that SSH disciplines should be further developed for the 2025-2027 strategic plan[191].

Respondents were asked for their views on potential untapped complementarities between the different Horizon Europe Clusters. They flagged untapped complementarities between Cluster 2

[186] Without specifically inquiring for co-programmed, co-funded and institutionalised.
[187] Included options: 'to a great extent' and 'somewhat', excluding 'I don't know/no opinion'.
[188] Included options: 'to a great extent' and 'somewhat'.
[189] Social sciences and humanities encompass various disciplines such as social sciences, education, business, law, and humanities and the arts, notably including economics, sociology, demography, anthropology, psychology, geography, human rights, journalism, library and museum science, religion and theology, foreign languages and cultures, history, philosophy, fine arts, performing arts, graphic and audio-visual arts, and design. Please see glossary for comprehensive list of SSH disciplines as per the Horizon Europe programme guide.
[190] European Commission, G for Research and Innovation, Integration of social sciences and humanities in Horizon 2020 – Participants, budgets and disciplines 2014 - 2020 – Final monitoring report, Publications Office of the European Union, 2023. https://data.europa.eu/doi/10.2777/075642, p. 58.
[191] Directorate-General for Research and Innovation. (2023). Synopsis report: Looking into the R&I future priorities 2025-2027, p. 37, https://data.europa.eu/doi/10.2777/93927.

projects and Cluster 3 in particular (44%, 320), followed by Clusters 4 and 1 (39%, 284 and 281 respectively)[192].

Specific findings were observed for Clusters under Pillar II. For example, interviewed Cluster 2 project coordinators acknowledged that the integration of the SSH aspect throughout Pillar II Clusters has facilitated greater interdisciplinary collaboration, enabling SSH participants to engage more extensively in scientific domains beyond SSH, and positioning SSH as a critical driver of project impacts across all Clusters[193]. Cluster 4 interviewees however reported that the effective incorporation of SSH into its funded projects could be better targeted at specific actions, while the cluster placed increasing importance on the integration of skills and the human dimension in the various topics[194].

In Clusters 5 and 6, the broader consideration of societal needs and processes received limited attention, although destinations focusing on climate science, food and communities dedicate over half of their funding to projects with contributions from SSH[195].

Promotion of gender equality

Between 2021 and 2023, Horizon Europe allocated **EUR 215.3 million to actions focused on improving gender equality (i.e. where it was a principal objective)**. Another EUR 4 841.4 million was allocated to actions with gender equality as an important and deliberate objective but not as the main reason for intervention. In total, **EUR 5 056.7 million can be *directly* linked with gender equality-advancing efforts,** corresponding to 11% of Horizon Europe commitments[196]. Examples of such contributions include funding for gender-related research under Horizon Europe Pillar I (e.g. Marie-Skłodowska-Curie Actions and the ERC), under Pillar II (e.g. gender biases in AI, radicalisation and violence against women, women's health, backlash against women in politics, women in rail), and under Pillar III (the Women Leadership Programme (EIC), the EU Prize for Women Innovators (EIC/EIT), the Supernovas (EIT), Girls Go Circular (EIT) and WIDERA (e.g. implementation of inclusive gender equality plans).

The figures above are ex-ante budgetary estimates: project-level estimates on gender equality relevance of funded activities are not yet available to this evaluation. It is likely that the share of Horizon Europe activities with *some* relevance for gender equality is higher than 11%: as of January 2025, only 19.5% of all research topics under the Horizon Europe main work programme[197] explicitly indicated that gender equality is not at all relevant.[198]

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[192] Ibid p. 45

[193] Resilient Europe Case Study 7: Research on democracy in practice, in annexes to the evaluation study. https://data.europa.eu/doi/10.2777/22355, p. 366.

[194] Green Transition evaluation report, 2024; in Section 3.1.1.3. https://data.europa.eu/doi/10.2777/67934 Digital and Industrial Transition study, 2024; Section 6.2.3. https://data.europa.eu/doi/10.2777/845650

[195] Green Transition evaluation report, 2024; in Section 3.1.1.3. https://data.europa.eu/doi/10.2777/67934

[196] The total contribution that can be directly linked with gender equality-advancing efforts was divided by the total programme funding committed at the end of 2023 (EUR 44 039.9 million), as reported in the Horizon Europe Performance Statement, retrieved on 01/12/24 from Horizon Europe - Performance - European Commission (europa.eu). The **estimated total contribution** - including indirect contributions - **is expected to be higher**, amounting to EUR 36 067.8 million. Funding allocation from score 0 and score 0* integrated in total.

[197] This definition encompasses R&I actions, Innovation actions, and Cofund actions. It does not include non-research Coordination and support actions, procurement, prizes, Framework Programme agreements, as well as any actions for which this flagging system does not exist (e.g. joint undertakings and all bottom-up actions)

[198] Figure from CORDA as of 2 December 2024. In Horizon 2020 specific topics were flagged as "relevant for gender mainstreaming" whereas Horizon Europe rolled out the requirement of integrating the gender dimension as a default for all RIAs, IAs and COFUND, unless it is expressly specified otherwise. See factsheet on gender equality provision under Horizon Europe https://op.europa.eu/en/publication-detail/-/publication/51704c8d-ca5f-11eb-84ce-01aa75ed71a1.

As a benchmark, an estimated 23% of Horizon 2020 projects took the gender dimension into account[199].

Table 1: Gender balance in Horizon Europe[200]

Indicators	Horizon 2020	Horizon Europe	Horizon Europe target
Percentage of women expert evaluators	42%	45%	50%
Percentage of women participating in Horizon 2020 / Horizon Europe advisory groups and expert groups*	43%	51%	50%
Percentage of women coordinators in FP projects	24%	31%	n/a
Percentage of women researchers in FP projects	37%	38%	n/a

Source: Commission monitoring data (cut-off date: 6 January 2025). For Horizon 2020 advisory groups: Horizon 2020 ex-post evaluation, section 'Promotion of gender equality in Horizon 2020' (p. 45)

The percentage of women in Commission expert evaluation panels and in Horizon Europe advisory and expert groups has increased compared to Horizon 2020. Women now sign 45% of expert evaluation contracts, against 42% at the end of Horizon 2020. Moreover, as of 2025, women make up 51% of Horizon Europe advisory and expert groups (against a 50% target): a considerable increase since Horizon 2020 (43%) and FP7 (33%). The share of women-led consortia has also substantially increased, from 24% under Horizon 2020 to 31% under Horizon Europe. Although the percentage varies significantly from one programme part to another[201], the positive trend is also observed in the programme parts where women's participation is lower[202].

Conversely, the share of women participating in projects as researchers is similar to that of Horizon 2020 (38% of all researchers), with a notable exception of the MSCA where the share of women among recruited researchers (fellows) is 45.1%[203]. **This is higher than the average share of women researchers in the EU in 2021 - 33.7%**[204]. While this under-representation occurs at all career stages, the imbalance is more pronounced in later stages: women represent only 26% of senior researchers/associate professors and full professors/directors of research participating in the programme[205]. This figure is lower than the EU average (e.g. 29.7% for grade A researchers).

In private sector-oriented parts of the programme, the participation rate of women is lower:

- The share of women-led companies and of companies with women CEOs accounted for 19% and 17% of EIC Accelerator companies respectively[206].
- 24% of start-ups created through EIT innovation projects in 2021-2022 are led by women[207].

[199] SWD on the ex post evaluation of Horizon 2020, SWD(2024) 29 final, p. 46

[200] These and other monitoring figures on gender equality in Horizon Europe have been first released in the following report: Commission: Directorate-General for Research and Innovation, Neehus, S. and Volpe, R., *Fostering gender equality – Key figures from Horizon Europe – R&I monitoring flash*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2777/2941871

[201] The share of women coordinators in Horizon Europe projects ranges from 81% in European innovation ecosystems and 55% for reforming and enhancing the European R&I system, to as low as 21% for Cluster 3 – "Civil Security for Society".

[202] For example, the percentage of women-led consortia in digital, industry and space topics (current Cluster 4 'Digital, Industry and Space') increased about 5 percentage points between 2014 and 2022, Digital and Industrial Transition, Final Report, p. 81.

[203] 2 890 out of 6 403, as of 1 July 2024. Data provided by DG EAC.

[204] She Figures 2024 – Gender in R&I, p. 138, https://data.europa.eu/doi/10.2777/592260

[205] While women represent 48.1% of first stage researchers (Category D), women are significantly less represented among top grade researchers (26%). Commission administrative & monitoring data, cut-off date: 31 May 2024.

[206] Women in Innovation Actions data extraction, March 2024. Women-led companies figure encompasses successful CEOs, CTOs and CSOs.

[207] Innovative Europe evaluation study, 2024, p. 78. https://data.europa.eu/doi/10.2777/499132

- **The share of women participants in the partnerships' activities is below 30%**[208]**.** This is well below the proportion of women employed in science and technology in the EU in 2022 (52%), the overall proportion of women among scientists and engineers (41%)[209], as well as the share of women researchers in Horizon Europe (38%).

These results are consistent with the broader start-up and scale-up landscape. In the EU, women reportedly represent only 2% of the founders of 'unicorn' companies[210], and there is an estimated USD 1.7 trillion financing gap for women-owned SMEs[211]. The share of investment attracted by women-led start-ups also remains comparably low, with only 8.7% of investments going to women-led companies[212]. The discrepancy is particularly pronounced for venture capital funding, as in 2023, all-men founded companies secured 75% of capital raised whereas all-women founded companies secured a mere 7% (the remaining 18% was secured by mixed companies)[213]. A significant funding imbalance persists for all-women teams, who receive 2 to 6 times less investment than all-men teams, despite securing a similar number of deals[214]. Closing this considerable gender gap is crucial for the EU if it is to harness the full potential of women entrepreneurs, which would increase economic output and innovation[215].

In 2022, **gender equality plans (GEPs)** became an eligibility criterion for public bodies, research organisations and higher education establishments. The objective was to increase awareness about and action on gender equality and inclusiveness[216]. Data updated in January 2025 shows that 81% of Horizon Europe applications in these categories declared to have a gender equality plan at proposal stage[217] – a considerable improvement given that most research performing organisations in EU countries did not yet have a GEP in 2021[218].

At the end of 2023, the European Commission conducted a pilot compliance check on a randomly selected set of beneficiaries and affiliated entities of projects funded under Horizon Europe calls with deadlines in 2022. The findings of the pilot check revealed deficiencies in GEPs in 59% of the checked entities, resulting in the launching of grant termination procedures for three entities[219]. The effectiveness of gender equality plans (GEPs) could be further supported by

[208] The only partnership where women account for more than 30% of participants is the Circular Bio-based Europe JU (39% of participants). See figure in BATT4EU partnership external evaluation report, p. 36, Digital and Industrial Transition evaluation support study - Annex 1: Cross-partnership Analysis, p. 49, and figures in the EIT Gender Equality Plan 2023 Implementation Report. https://eit.europa.eu/sites/default/files/2024-02/EIT%20GEP%202023%20Implementation%20Report_ADOPTED.pdf.

[209] Eurostat. https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230602-1.

[210] The JRC Technical Report 'In search of EU unicorns - What do we know about them?' examines the gender of founders and finds a pronounced gender equality gap in the creation of innovative start-ups. Notably among the founding teams of unicorn companies in the EU, there are 3 founders per company (N=94) 2% of which are women based on an analysis of Crunchbase data. Innovative Europe, Final Report, p. 78.

[211] Financial Alliance for Women (2022), retrieved 5/12/24 at: https://financialallianceforwomen.org/the-opportunity/#growthpotential, data based on World Bank findings. Innovative Europe, Final Report p.78.

[212] Financial Alliance for Women (2022). https://financialallianceforwomen.org/the-opportunity/#growthpotential. Retrieved 5 December 2023, data based on World Bank findings.

[213] Atomico (2023), The State of European Tech 2023.

[214] Atomico (2022), The State of European Tech 2022.

[215] European Commission, Science, Research and Innovation Performance of the EU, 2024, p. 344.

[216] See factsheet on gender equality provision under Horizon Europe, retrieved 05/07/24 at https://op.europa.eu/en/publication-detail/-/publication/51704c8d-ca5f-11eb-84ce-01aa75ed71a1.

[217] Commission monitoring systems (CORDA), data at 13 January 2025.

[218] Information available in the Gender Equality in Academia and Research (GEAR) tool and reported in a report from the ERAC Standing Working Group on Gender in Research and Innovation (ERAC SWG GRI). Available at: https://data.consilium.europa.eu/doc/document/ST-1202-2021-INIT/en/pdf. Excellent Science, Annex 2.12, p. 550.

[219] Results reported by Commission services on 13 December 2024.

facilitating development of compliant plans, and by strengthening enforcement by means of *ex ante* verification and regular *ex post* compliance checks[220].

What messages emerged from the stakeholder consultation?

Overall, 36% (575) of respondents agreed and 15% (229) strongly agreed that strengthened gender equality provisions have the potential to promote gender equality across R&I organisations and activities. Citizens were the most positive across the various stakeholder groups, closely followed by public authorities (61%; 51)[221].

The least positive stakeholder group, i.e. those that (strongly) disagreed that these provisions have the potential to promote gender equality across R&I organisations and activities – were companies (15%; 40), academia (14%; 111) and EU citizens (13%; 25).

International cooperation, including association of third countries

Stakeholders consulted in interviews and during workshops stressed that the Horizon Europe internationalisation strategy should follow a 'win-win' principle, ensuring reciprocity and a level playing field with international partners (e.g., exploitation rules, IPR, etc.) and strengthening ties with 'like-minded' countries[222]. In the first two 2-year work programmes, 21% of collaborative research topics encouraged international cooperation.

Horizon Europe extended the association policy to like-minded third countries – countries with a strong R&I basis, located in the EU neighbourhood and beyond. It offered them the possibility of a partial association[223] and reciprocal access to national R&I programmes of associated countries seen as equivalent to Horizon Europe. Under Horizon 2020, reciprocity clauses were introduced only in the association agreements with Switzerland and the Faroe Islands (similar provisions existed in the FP7 Association Agreement with Israel). In line with the regulation establishing Horizon Europe, such reciprocity clauses have been introduced in all new association agreements.[224] As of October 2024, through the reciprocity clause, the association of third countries has provided access to EU-based entities in 64 national programmes of the 19 associated countries[225].

The association of third countries also implies a substantial financial input. The combined annual financial contribution of the associated countries is close to EUR 3 billion, resulting in a substantial increase in the funding for R&I activities under Horizon Europe (Horizon Europe budget and the financial contribution of associated countries constituting external assigned revenue of the Union budget).

For high-income countries, association has increased access to excellence and globally-ranked research performing organisations and infrastructures. In the targeted evaluation survey, 73% of responding beneficiaries agreed to a (very) large extent that Horizon Europe has achieved or is likely to achieve increased international visibility through collaboration with leading global partners (3 208 respondents).

Partners from associated countries supplement scientific areas in which Member States may be lacking: the *ex post* evaluation of Horizon 2020 found that peer-reviewed publications, involving

[220] European Commission: Directorate-General for Research and Innovation, Pépin, A., Andriescu, M., Buckingham, S., Moungou, A. et al., *Impact of gender equality plans across the European Research Area – Policy briefs*, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/655676

[221] Either "agreed" or "strongly agreed" with the statement.

[222] Viscido, S., Lotito, A. and Boekholt, P., Horizon Europe and the digital & industrial transition – Interim evaluation support study, Publications Office of the EU, 2024, p. 113. https://data.europa.eu/doi/10.2777/845650.

[223] In all cases so far, in relation to Pillar II, which addresses global societal challenges such as climate change.

[224] In line with Article 16 (4) Horizon Europe Regulation.

[225] As examples, EU-based entities now have access to programmes in Associated Countries such as the Israeli National Quantum Initiative, the Turkish Industrial R&D Supports Programme and the calls from Canada's Natural Sciences and Engineering Research Council (Alliance grants, Alliance International grants, Alliance International Quantum grants; Collaborative Research and Training Experience (CREATE) Quantum Call).

a contributor from at least one associated or other non-EU country, have a higher scientific impact[226].

Association also contributes to broader geopolitical goals: the reform of national R&I systems in the enlargement countries and support to R&I capacity building[227]. their alignment with the ERA and the EU objectives in the area of 'Science and Research' (EU acquis, Chapter 25)[228]. All nine states recognized as candidates for EU membership are associated to Horizon Europe: Albania, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, North Macedonia, Serbia, Türkiye and Ukraine. Kosovo, which formally submitted its application for EU membership in 2022 and is considered a potential candidate, also became associated to Horizon Europe for the first time in 2021. These countries are collaborating in projects such as Montevitis[229], which has developed infrastructure for the systematic collection of data on the viticulture sector, enabling an analysis of climate change effects[230]. In addition, as the majority of the associated countries belong to the widening group, Horizon Europe is helping to narrow the gap in R&I excellence across the continent[231].

The list of associated countries has changed between Horizon 2020 and Horizon Europe. The United Kingdom, considered a Member State throughout Horizon 2020, became a third country and then became associated since 1 January 2024[232]. Switzerland was associated in Horizon 2020 and negotiations were concluded in December 2024 for its association to Horizon Europe. Both countries have historically had high participation in Framework Programmes. According to Commission analysis, participation of UK entities in particular has considerably declined compared to Horizon 2020[233].

The change in status of the UK and Switzerland affects participation statistics. Across the programme, the EU contribution to associated countries shows a relative decrease, from 8.6% to 7.5% compared to Horizon 2020. At the same time, associated countries have a high share of newcomer participants among all country groups (54%, although lower than the 63% in Horizon 2020)[234]. Non-associated third countries also have high newcomer participation: 55% of all participants and 26% of all funding.

As a group, non-associated third countries have had a small surge in shares of distinct applicants (up from 7% to 10.1%), total applications (from 4% to 5.6%) and requested EU contribution (from 1% to 2.3%) compared to Horizon 2020. Horizon Europe pillar I stands out for its international dimension, with 10.7% of participants coming from non-associated third countries, followed by Pillar II (5.4%), Pillar III (2.9%) and WIDERA (2.8%).

More specifically, the share of participation of associated and third countries in collaborative projects has increased compared to Horizon 2020. 62% of Horizon Europe Pillar II projects include at least a participant from an Associated Country, compared to 44% under Horizon 2020. The change in status of the UK is an important driver, but the involvement of associated countries in collaborative projects is higher than in Horizon 2020 even without the UK, see Table 2). An

[226] Cited more than MS-only publications and three times more than the world average, SWD(2024) 29 final, p. 47.
[227] International cooperation case study, Excellent Science, pp. 15, 44. https://data.europa.eu/doi/10.2777/9552959
[228] Ibid, pp. 15-16, 44.
[229] https://cordis.europa.eu/project/id/101059461
[230] https://montevitis.eu/introducing-the-montevitis-phenology-app-revolutionizing-viticulture-data-collection/
[231] Case study on international cooperation, Excellent Science study, pp. 16, 44, 46.
[232] In this and all other state of play figures, the UK is treated as an Associated Country for all grants and proposals since the start of the Programme (2021), even though it only became an Associated Country on 1 January 2024. The same applies to the other countries that became Associated Countries during the implementation of Horizon Europe (Canada, New Zealand).
[233] European Commission, Country participation in the EU R&I framework programmes (2021-2023), p. 12 and 17.
[234] Ibid, Figure 16.

analysis[235] of the Commission shows that even before it became associated, UK entities were participating in three out of ten Horizon Europe collaborative projects.

Table 2: Collaborations, participations, and funding by type of country (international cooperation)

Indicators on international participation in collaborative projects	Associated countries		Other third countries	
	Horizon Europe	Horizon 2020	Horizon Europe	Horizon 2020
Share of participation in collaborative projects	10%	7%	6%	5%
Pillar II only (II-III for Horizon 2020)	*10%*	*7%*	*5%*	*4%*
Share of EU contribution in collaborative projects	6%	7%	1%	1%
Pillar II only (II-III for Horizon 2020)	*6%*	*7%*	*2%*	*1%*
Share of collaborative projects involving country group	48%	37%	33%	22%
Pillar II only (II-III for Horizon 2020)	*62%*	*44%*	*37%*	*15%*

Sources: CORDA as of 6 December 2025

International cooperation is not limited to participation of associated and non-associated teams in projects, it also takes with the form of programme-level cooperation, partnerships that are international by design, such as EDCTP3 or through global consortia involving funding agencies from third countries pooling their resources and defining a common strategic research agenda (such as the International Rare Diseases Research Consortium or Water4All on water security).

What messages emerged from the stakeholder consultation?

When asked about for the benefits of Horizon Europe, a large majority of respondents (74%; 1 184) agreed that **participating in Horizon Europe "improved cooperation with partners from other countries - within the EU and beyond"**. Results were similar for all country groups. Public authorities (88%), NGOs (77%) and academia (74%) were the most likely to select this option. Non-EU citizens were also likely to select this option (67%), as were EU citizens (65%).

70% of respondents (1 367) highlighted the need to improve international cooperation. Most position papers that addressed this issue highlighted the relevance of international R&I activities to the programme. Some also provided the following suggestions for improvement: 1) association of the UK and Switzerland; 2) addressing practical issues that arise as a result of the variation in statuses of third countries (e.g. countries with transitional arrangements, countries in negotiations), including budgetary and administrative consequences when the country's status changes; 3) complexities in building synergies with international initiatives (e.g. the Belmont Forum) under Horizon Europe compared with Horizon 2020; and 4) the late communication of the work programmes as an obstacle to the better integration of non-EU partners[236].

Horizon Europe's openness to international cooperation is balanced with safeguarding EU interests in strategic areas. Its Regulation sets out new provisions[237] **for actions related to EU strategic assets, interests, autonomy and security**. The table below provides an overview of **Article 22(5)** application - the topics open to specified third countries primarily relate to quantum research, artificial intelligence, and critical raw materials.

Table 3: Overview of the application of Article 22(5) in the main Horizon Europe work programmes (WP) 2021-2022 and 2023-2024 and instruments

Overview	**WP 2021-2022**	**WP 2023-2024 (main WP)**	**WP 2023-2024 (after amendment)**
Total HE budget per WP	€ 27,433,798,406	27,416,624,390 €	27,416,624,390 €
Total budget per main WP	€ 15,978,811,926	13,519,989,622 €	14,887,909,796 €
Topics applying Art. 22(5) (*topics open to specified third countries)	**49 topics (*19 topics)**	**31 topics**	**33 topics (*14 topics)**

[235] European Commission, Country participation in the EU R&I framework programmes (2021-2023), p. 19
[236] Ibid, figure 14.
[237] Articles 22.5 and 22.6 of Regulation (EU) 2021/695 set the foundation for the protection of information.

Total Budget subject to Art.22(5)	€ 786,120,000	475,500,000 €	540,000,000 €
Share of main WP budget subject to Art.22(5)	**4.92%**	**3.52%**	**3.63%**
Share of total Horizon Europe budget subject to Art.22(5)	**2.87%**	**1.73%**	**1.97%**

Source: DG RTD, reflecting the amendment of 17 April 2024 to the 2023-2024 work programme.

In addition, the EuroHPC JU has made use of Article 22(5) in six calls in its first three work programmes. The EIC work programme for 2024 also provides for specific economic security measures such as specific eligibility criteria and investment safeguards.

Cooperation with entities based in China has been excluded from all innovation actions in the Horizon Europe 2023-2024 work programme[238], due to concerns linked to unwanted IP transfer and the stalling of negotiations on the joint roadmap for the future of EU-China cooperation in science, technology, and innovation. Covering 243 actions, this provision does not apply to EU-based entities controlled by China.

In the amendment to that work programme, entities assessed as being "high risk suppliers"[239] of mobile network communication equipment are excluded from taking part in 35 actions.

Security scrutiny[240] addresses potential misuse of project results of sensitive of classified nature (e.g. results that could be channelled into crime or terrorism). In 2023, the security appraisal involved screening 118 proposals (68 in 2022), of which 20 underwent the security scrutiny procedure in cooperation with national security experts[241]. Examples of security-sensitive topics include explosives and CBRN, infrastructure and utilities, border security, intelligent surveillance, terrorism & organised crime, digital security, and space.

Applying these safeguards can be cumbersome for Member States, associated countries and the Commission departments (e.g. the assessment of control necessary for applying Art. 22.5 requires a complex process involving many entities at Member State and EU level). Nevertheless, the safeguards incorporated into Horizon Europe feed into the European economic security strategy, which identified four categories of risk[242], and its implementation[243].

What messages emerged from the stakeholder consultation?

The majority of respondents (56%; 650) stated that their project was **not "impacted by the exceptional limitations on participation in Horizon Europe by non-EU legal entities"** or was impacted a little, while 13% (151) indicated that their project was impacted to a great extent. Academic and research institutions seem to have been affected more than any other stakeholder group (around half of responses submitted indicated that their project was affected "to a great extent".

[238] Under Art. 22.6 which allows, where appropriate and duly justified, to insert additional eligibility criteria in the work programme, taking account specific policy requirements or the nature and objectives of a given action.
[239] Set out in the second report on Member States' progress in implementing the EU toolbox on 5G cybersecurity of 2023 and the related Communication on the implementation of the 5G cybersecurity toolbox of 2023.
[240] Art. 20 of Regulation (EU) 2021/695 sets the foundations for the protection of information in the programme.
[241] European Commission, DG for Research and Innovation, Annual report on research and technological development activities of the EU and monitoring of Horizon Europe and Horizon 2020 in 2023, published in 2024, COM(2024)231 final, p. 2. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52024DC0231
[242] The strategy identified broad, non-exhaustive categories of risk to economic security, related to: 1) resilience of supply chains; 2) physical and cyber security of critical infrastructure; 3) technology security and leakage; and 4) weaponisation of economic dependencies or economic coercion. They can occur along the value chain, from basic research to commercialisation and manufacturing. JOIN(2023)20final, https://op.europa.eu/s/zW9M.
[243] The Commission's economic security package includes a white paper on enhancing R&D support involving technologies with dual-use potential and a proposal for a Council Recommendation on research security.

4.1.3. Effectiveness: **Towards economic impacts** – To what extent has Horizon Europe fostered innovation-based growth, created jobs and leveraged investments in R&I (Key Impact Pathways 7-9)?

This section assesses Horizon Europe's contribution to the three key impact pathways focusing on the desired economic impacts: 'Generating innovation-based growth'; 'Creating more and better jobs'; and 'Leveraging investments in R&I'.

Figure 12: Economic impacts of Horizon Europe – Key Impact Pathways 7-9

Source: Annex V to Regulation 2021/695.

Generating innovation-based growth (Key Impact Pathway 7)

As of 6 January 2025, Horizon Europe beneficiaries reported 124 *validated* outputs concerning intellectual property rights (IPR). These include patent applications, trademarks, and utility designs[244]. By comparison, at the same stage of Horizon 2020, only five valid IPR applications had been reported. So far under Horizon Europe, 3 703 innovative products, processes or methods have been produced and reported by the projects. The process for research IPR application and ultimately award of IPR is lengthy: for FP7, IPR applications almost tripled within 7 years of its *ex post* evaluation[245].

Pillar II projects have reported 24 IPR applications, but 1 900 innovative outputs (particularly new methods and product innovations). Most IPR applications recorded up until now are under Pillar III, particularly the EIC Accelerator (76).

Since 2011, the European Research Council (ERC) 'proof of concept' grants have been helping researchers bring their ideas from the laboratory and academia to the realm of business, marking a crucial phase in the innovation lifecycle. In other words, they help the beneficiaries to bridge the gap between the results of their pioneering research and the early phases of its commercialisation. Notable projects funded in the 2023 include[246]:

- Istituto Italiano di Tecnologia's project STORE-LIGHT, which focuses on advancing solar energy storage by combining solar energy conversion and storage into one system.
- In the field of medical technology, the FitSleep project is set to revolutionise the treatment of obstructive sleep apnoea, a condition causing disruption in breathing during sleep,

[244] While it is expected that the number of IPR applications reported by projects at this stage is low and unrepresentative, there is evidence that the number available in Commission monitoring systems is an underestimate of the current IPR activity of participants. IPR applications reported under cascading actions, such as the EIT and co-funded partnerships, are only very partially reflected in the system at the reference date (see Section 4.2.5). This may be particularly impactful for the EIT KICs, which have reported over 300 IPR applications in the 2021-2023: however, the data was not yet validated in central monitoring systems at the reference date.
Moreover, the continuous reporting tools of the programme allow beneficiaries to encode aggregate data about the *confidential* IPR applications they submitted. The tool suggest that participants have submitted already at least 700 IPR applications, of which more than 600 for patents only; the vast majority (over 400) are for EIC projects. However, the data structure of this reporting does not allow to verify the validity of these applications, and in particular to check whether these have been lodged before the start of the projects concerned – as observed in the Horizon 2020 final evaluation, these "background" IPR outputs are commonly reported by beneficiaries in continuous reporting tools.

[245] SWD(2024) 29 final, p. 62.

[246] https://erc.europa.eu/sites/default/files/2024-01/erc-2023-poc-3-dl3-results_list.pdf

affecting over a billion people worldwide. This pioneering device uses non-invasive electrical stimulation to activate tongue muscles, preventing airway collapse during sleep.

More detail on this bridging mechanism between Pillars I and III is provided in chapter 4.3.1.

As noted in chapter 3, Horizon Europe has provided support to around 16 220 companies through grants, out of which 2 571 in pillar III (excluding the EIC Fund). This includes large companies: more specifically, in the period of 2018-2024, the EIC and EIC pilot supported over 70 companies that achieved 'centaur' status (valuation above of EUR 100 million) – of these, six are valued at over EUR 500 million[247]. In the Horizon Europe period alone, the programme supported 30 centaurs[248].

In 2021-2023, according to EIT data, the EIT KICs reported to have launched 956 innovations on the market[249], created 436 start-ups and provided support to 5 806 start-ups and scale-ups.[250]

Creating more and better jobs (Key Impact Pathway 8)

With the support of Horizon Europe, 39 543 full time equivalent (FTE) jobs were created or maintained by organisations participating in the programme, based on data declared by 21% of funded projects before 6 January 2025. By comparison, at the same stage of Horizon 2020, projects were maintaining 17 365 FTE employees.

The NEMESIS macroeconomic model estimates an increase in the number of persons employed in the research sector of up to 60 000 jobs by 2023-2024, which is similar to the estimations performed for the impact assessment of Horizon Europe[251] [252]. In the long-term, the total Horizon Europe is estimated to create a total of 1 490 jobs in 2021, 20 400 jobs in 2023, and to reach a maximum of 63 000 jobs in 2033-2034[253]. The 63 000 jobs created in 2033-2034 include 2 000 in research and 61 000 in production activities. They also include 41 000 low qualified jobs and 20 000 high qualified jobs[254]. The current calculations are based on data up to June 2023 encompassing EUR 22.8 billion in EU contribution to projects, and are consistent with the *ex ante* estimation presented in the impact assessment up to that date[255].

Moreover, according to RHOMOLO macroeconomic model analysis (see Annex 2, data as of 2 July 2024), Horizon Europe has led to an increase in employment, its impact peaking at +0.06% in 2023, amounting to about 128 000 persons (the total number of persons employed in the EU and UK in the base year of the model is almost 232 million).

Leveraging investments in R&I (Key Impact Pathway 9)

Programme participants have already mobilised EUR 10.2 billion in co-investment to implement the projects, in complement to the initial investment of the programme. This is a considerable

[247] EISMEA, Scaling Deep Tech in Europe – the European Innovation Council Impact Report 2025, p. 9, https://eic.ec.europa.eu/document/download/7b947b36-66cb-4471-a2d0-158d5ae6770f_en?filename=EIC-Impact-Report-2025.pdf.
[248] DG RTD monitoring.
[249] Figures of innovations reported by the EIT KICs are not yet fully reflected in the Commission's central monitoring system.
[250] Annexes 21-27; Chapter 1 on Effectiveness, summary of tables on EIT KICs data on KPIs.
[251] SWD(2018) 307 final, Part 2/3, p. 36. Estimating a gain of up to 100 000 jobs in R&I activities in the investment phase (2021-2027).
[252] The discrepancy between the macroeconomic model and the KIP8 indicator can be attributed to 1) the lag in project reporting, 2) the fact that the latter includes jobs maintained by participants, not only created, and 3) by macroeconomic models estimating economy-wide employment in research sectors, not restricted to projects funded by the programme.
[253] Innovative Europe study, 2024, p. 60. https://data.europa.eu/doi/10.2777/499132.
[254] Based on the 'medium' case.
[255] Estimating a gain of 200 000 jobs over 2027-2036, 40% high skilled. See SWD(2018) 307 final, Part 2/3, p. 36.

increase compared to the same stage in Horizon 2020, when just over EUR 5 billion in co-investment had been provided by project participants.

Leverage factors of different Horizon Europe programme parts (the ratio between co-investment from participants and financial contribution from the EU) vary widely. Under Pillar II only, they range between 0.01 in civil society and academia-oriented Cluster 2 to around 0.35 in more industry-oriented Cluster 4 and Cluster 5. The co-investment rate is primarily a function of the funding rate of each action, which is defined *ex ante* by the Commission; moreover, in general, costs for private for-profit entities are covered to a lesser extent than those of universities or non-profit organisations. Annex 7 presents a more detailed analysis.

In the short-term, one of the added value aspects of the European partnerships and EU Missions was the aim to leverage external funds towards Research and Innovation. Their progress is discussed below in section 4.4.1 on EU added value.

Programme-wide macroeconomic effects on GDP

For estimating long-term economic effects, this evaluation uses three macro-economic models[256], providing a GDP multiplier in the range of 4 and 11, by 2045:

NEMESIS macroeconomic modelling[257] estimates that expected GDP gains for the EU-27 induced by Horizon Europe increase progressively, from EUR 0.2 billion in 2021, to EUR 3.3 billion in 2023 and EUR 14 billion by 2032-2034, making up 0.0012%, 0.023%, and 0.085% of GDP, respectively (see table 4 below). This is on track compared to estimates in the impact assessment[258], considering that the current estimation accounts for only a fraction of the overall budget of the programme (EUR 22.8 billion in signed grants by 10 June 2023). The GDP effect is thus limited to the budget allocated so far. The GDP multiplier shows that each Euro invested through Horizon Europe is expected to return up to EUR 11 in GDP gains by 2045, the same 25-year period reported on in the impact assessment.

The estimations of the RHOMOLO macroeconomic model, which build upon Horizon Europe funding data allocated by 2 July 2024, show that GDP impact increases steadily over the implementation period, peaking at +0.10% in 2024. It then gradually declines as the simulated monetary injection ends, the increased private and public capital stocks depreciate and the temporary increase in total factor productivity (TFP) fades. The GDP multiplier exceeds 6.5 by 2045. A comparison of these results with those of the ex-ante impact assessment carried out with an earlier version of the RHOMOLO model suggests that the impact of the policy is in line with, and even exceeds, the expected impact[259].

The FIDELIO macroeconomic model is also based on Horizon Europe projects data from July 2024, and shows similar results to RHOMOLO in terms of GDP impact over years. EU GDP increases swiftly during the implementation period, with a peak of +0.10% in 2023, then declines slowly as the financial injection (modelled over 2021-2024) ends. The GDP multiplier keeps rising after the end of the programme due to the supply-side effects of the policy, and reaches 4.4 in 2045, 25 years after the start of the financial injection. In 2023, within the EU, most (69%) of the impact is directed towards the private sector (BERD), followed by higher education

[256] See Annex 2 for detailed methodology and results.
[257] NEMESIS model results are reported for the Horizon Europe (2021-2023)-only scenario.
[258] SWD(2018) 307 final, Part 1/3, p. 40.
[259] The continuation scenario in the ex-ante impact assessment estimated the cumulative impact on GDP up to 2030 to be +0.63% compared to a no-policy scenario. The cumulative impact of the funds analysed is expected to be +0.73% by 2030, with a volume of investment around half of that simulated in the ex-ante analysis. This is due to the different assumptions on the funds' geographical distribution, their composition and alternative hypotheses on crowding in of private investment and additional returns from European funds.

institutions (HERD), while the impact on the public sector (GOVERD) is relatively small[260]. The BERD impact is particularly directed towards the manufacturing sector, with the top benefiting industries being machinery and equipment, computer and electronic products, motor vehicles and fabricated metal products.

Table 4: Results of macro-economic modelling for Horizon Europe funding (Nemesis, RHOMOLO, FIDELIO)

Model	2021	2023	2025	2027	2030	2034	2040	2045
Nemesis								
GDP gain (in bn EUR 2020/y w.r.t. reference scenario)	0.2	3.3	4.8	6.6	12.2	13.8	9.3	6.6
GDP gain (% w.r.t. reference scenario)	0.00%	0.02%	0.03%	0.04%	0.08%	0.08%	0.05%	0.03%
RHOMOLO								
GDP gain (in bn EUR 2020/y w.r.t. baseline scenario)	0.3	11.1	13.3	11.6	9.9	8.1	6.1	4.8
GDP gain (% w.r.t. baseline scenario)	0.00%	0.08%	0.1%	0.09%	0.07%	0.06%	0.05%	0.04%
FIDELIO								
GDP gain (in bn EUR 2020/y w.r.t baseline scenario)	0.2	10.6	9.8	7.0	6.6	5.6	3.5	2.5
GDP gain (% w.r.t. baseline scenario)	0.00%	0.08%	0.07%	0.05%	0.04%	0.03%	0.02%	0.01%

Pillar II economic effects

Most reported innovations come from Pillar II, which has produced 1 900. The majority of IPR applications come from Pillar III, with 91 recorded, while Pillar II has generated 24 IPR outputs and Pillar I has produced 6.

In Pillar II, Cluster 4 (Digital, Industry, and Space) leads with 763 innovations, followed by Cluster 6 (Food, bioeconomy, natural Resources, agriculture, and environment) with 411 and Cluster 5 (Climate, energy, and mobility) with 405. Cluster 1 (Health) contributed 153 innovations, while Cluster 2 (Culture, creativity, and inclusive society) and Cluster 3 (Civil security for society) have the fewest outputs, with 96 and 73 innovations respectively.

Among the main types of actions, joint undertakings from Pillar II have the highest direct leverage factor (0.8). In the average JU project, 55% of total eligible costs are covered by the EU, and the remaining 45% by project participants. For more information on this, see the analysis below under the EU added value.

European Innovation Council (EIC)

The Horizon Europe budget for Pillar III doubles the support that was available for equivalent programmes under Horizon 2020[261], with much of this increase (including a top-up from NextGenerationEU) supporting the full implementation of the EIC. Under Horizon 2020, there

[260] The distribution of impact between institutional sectors is related to the modelling of R&I spending in FIDELIO. It is assumed that 30% of the funding is dedicated to basic research, specifically in the NACE M72 category from the BERD sector, 30% to the HERD sector, 3% to the GOVERD sector, and the remaining 37% is allocated to applied research, covering the remaining BERD sector categories.

[261] Under Horizon 2020, the EIC Pilot had a budget of EUR 3 billion, and the collective budget of Innovation in SMEs was over EUR 1.5 billion. In contrast, the Horizon Europe budget for the EIC and EIE is EUR 10.6 billion (up to EUR 527 million for the EIE). The EIT budget increased by EUR 0.6 billion (EUR 3 billion in HE).

was a gap during the EIC Pilot stage for technology readiness level (TRL) 3-6 support, as the EIC Launchpad Pilot offered only relatively small grants for bridging what is known as the 'valley of death' for organisations looking to commercialise the outputs of their research. The Transition instrument filled this gap and allowed the EIC to cover the entire TRL scale. Only the EIC (Accelerator) offers direct equity investment into companies with options for grant, blended finance (grant and equity) or equity-only support - this is where EIC is unique in the framework programme and wider EU programme landscape. As of 6 January 2025, the EIC Pathfinder supported 363 projects, while the EIC Transition supported 137 projects. The EIC Accelerator selected for funding over 700 start-ups and SMEs across 30 countries.[262] An analysis conducted one year prior found[263] that 50% of EIC Accelerator beneficiary companies were incorporated for less than 5 years at the date of grant signature. For the EIC Fund, from 2020 up until February 2025, 272 companies pertain to the portfolio, among which 17 have been declared bankrupt.

While predominantly open, more targeted Challenge calls are an integral part of the Pathfinder and Accelerator schemes. The Challenges are developed based on policy priorities and the insights of EIC programme managers. Their purpose is to identify opportunities in new and emerging technology fields and to build project portfolios, with the ultimate goal of strengthening Europe's position in these fields. As of September 2024, there have been 22 Pathfinder Challenges and 14 Accelerator Challenges, along with 8 Transition Challenges which were discontinued after the 2023 work programme.

European innovation ecosystems (EIE)

The European innovation ecosystems (EIE) is a new component of the programme in Pillar III that aims to support the scaling up of companies and to spur innovation to address important challenges in a responsible way, as set out in the New European Innovation Agenda (NEIA)[264].

Since its launch, the EIE part of the Horizon Europe work programme has covered 782 unique participants, including 67 research organisations, 287 SMEs and 105 public bodies distributed across all the Member States[265]. As of June 2023, 53% of the researchers involved in EIE funded projects were women[266].

In addition, as of November 2024, the Innovative SMEs Partnership funded under the EIE has supported 1 420 SMEs (of which 1335 are receiving public funding and 85 are self-funding their activities, 328 from widening countries). However, between 12% and 19% of applications to the last three calls for proposals were not funded due to the lack of national funding.

The EIE work programme also addresses the innovation divide through the creation of Regional Innovation Valleys (RIVs). In June 2024, the Commission identified 149 regions[267] as RIVs in order to strengthen regional innovation ecosystems, bridge the innovation gap in Europe and improve Europe's overall innovation performance. While 51% of the selected regions are innovation leaders and strong innovators, 49% are moderate and emergent innovators.

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[262] EISMEA, Scaling Deep Tech in Europe – the European Innovation Council Impact Report 2025, https://eic.ec.europa.eu/document/download/7b947b36-66cb-4471-a2d0-158d5ae6770f_en?filename=EIC-Impact-Report-2025.pdf

[263] European Commission, DG Research and Innovation, SME participation in Horizon Europe, data from 1 January 2024, https://data.europa.eu/doi/10.2777/576670.

[264] The New European Innovation Agenda. https://research-and-innovation.ec.europa.eu/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/new-european-innovation-agenda_en.

[265] Data extracted from CORDA on 26 September 2024. This data excludes the SMEs funded via FSTP under the InnovSMEs partnership.

[266] Innovative Europe Study, p. 103. https://data.europa.eu/doi/10.2777/499132

[267] List as of July 2024 available at: https://research-and-innovation.ec.europa.eu/document/download/12476e45-0413-4487-bdd6-668d7457f1cc_en

In line with the remit of the EIE part of the Horizon Europe work programme's legal basis, the Commission has organised an EIC Forum of public authorities and bodies in charge of innovation policies and programmes covering all Member States, to promote coordination and dialogue on the development of the EU's innovation ecosystem. In the EIC Forum, more than 200 initiatives to support the NEIA at national level with legislative actions, policy initiatives or funding schemes have been announced[268].

European Institute of Innovation and Technology (EIT)

The EIT, with its KICs and regional innovation hubs, is present 'on the ground' in all Member States including modest and moderate innovation countries and regions, as well as some associated countries[269]. This allows it to operate in local languages, which is crucial for education and training, and for providing business support and advice. Thanks to these capacities, the EIT plays a role in preventing brain drain in those regions and promotes innovation through a geographically balanced approach[270].

The EIT and its EIT KICs are in charge of the management of several EU Skills Academies in strategic sectors for EU competitiveness, in particular those covered by the Net-Zero Industry Act, i.e. batteries, raw materials, solar, wind and hydrogen[271]. The objective of these Skills Academies is to accelerate training as well as up- and re-skilling in order to equip people with highly competitive skills that are in demand across Europe. Selected EIT KICs have been mandated by the Commission to lead those academies:

- The European Battery Alliance Academy (created by EIT InnoEnergy) is helping to ensure that Europe has enough skilled workers in the battery industry. The EBA Academy achieved its main target of 100 000 learners completing training by the end of 2024, ahead of the 2025 goal. According to the battery industry's estimates, 800 000 workers will need to learn new or additional skills by 2025 to bridge the skills gap[272].
- The EIT InnoEnergy has also been appointed as the Secretariat of the European Solar Photovoltaic Industry Alliance (ESIA), whose aims include creating 400 000 new direct and indirect jobs and 30 GW of annual solar PV manufacturing capacity[273,274].
- Venture Centre of Excellence – EIT Health, in partnership with the European Investment Fund, operates this public-private co-investment programme to empower finance for European health SMEs.
- EIT KICs also work together as EIT Community on activities such as the Deep Tech Talent Initiative (DTTI), one of the flagship initiatives of the new European Innovation Agenda. The target to train 1 million talents in deep tech fields by 2025 has been almost reached[275]. Also, the EIT Higher Education Initiative supports projects that aim to make universities more innovative and entrepreneurial.

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[268] European Commission, DG for Research and Innovation, Report on the state of play of the new European innovation agenda, Publications Office of the EU, 2024, p.3. https://data.europa.eu/doi/10.2777/097305.

[269] Bulgaria, Cyprus, Czech Republic, Estonia, Spain, Greece, Croatia, Hungary, Italy, Lithuania, Latvia, Montenegro, Malta, Poland, Portugal, Romania, Serbia, Slovenia, Slovakia, Türkiye, and Ukraine.

[270] See Innovative Europe Case Study 12 and Case Study 13 in Annex 4, https://data.europa.eu/doi/10.2777/354.

[271] Annex 2 to the Commission Implementing Decision C(2024)8194 on the financing of the Programme and the adoption of the work programme for 2025-2027.

[272] European Commission (2022) Questions and Answers: The European Battery Alliance. https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_1257 Accessed 4 July 2023.

[273] European Commission (2023) Commissioner Breton hosts ministerial meeting on European Solar PV Industry Alliance. https://energy.ec.europa.eu/news/commissioner-breton-hosts-ministerial-meeting-european-solar-pv-industry-alliance-2023-12-01_en.

[274] EIT InnoEnergy (n.d.) European Solar PV Industry Alliance. https://www.innoenergy.com/about/about-eit-innoenergy/industrial-value-chains/solaralliance/.

[275] https://www.eitdeeptechtalent.eu/

This unique support for skills building and learning does not exist in other Innovative Europe programme parts[276]. Since the beginning of Horizon Europe, the EIT Community has delivered the following results:

Table 5: Progress on EIT key monitoring indicators

Indicator	**Time period: 2021-2023** (results reported by EIT KICs and validated by EIT)		**Values from Horizon 2020's ex post evaluation** (SWD Table 12)
	Target	**End of 2023**	
Number of people who graduated from the EIT-labelled master's and doctoral programmes	3 378	2 757	Not reported
Number of start-ups created by students from EIT programmes	143	90	36 in 2017-2020
Number of start-ups as a result of EIT innovation projects	289	346	99 in 2017-2020
Number of start-ups that received support from EIT KICs	3 093	5 806	3 862
Number of innovative products or services put on the market by the EIT KICs	872	956	1 501
Participants in (non-degree) education and training	192 669	287 163	Not reported
Other indicators, on training and skills development[277]:	Target:	As of March 2025:	
Deep Tech Talent initiative	100 pledging partners	378 pledging partners	Not reported
	1 million people trained by end of 2025	over 900 000 trained talent	Not reported
The European Battery Alliance Academy	100 000 learners by 2025	112 000 learners	Not reported

Source: EIT administrative data based on the KICs' monitoring. Targets based on the KIC's Strategic Agendas and approved by EIT.

4.1.4. Towards the objective to **widen participation and strengthen the European Research Area**

Widening participation and strengthening the ERA is part of the Horizon Europe's general objective and is supported by WIDERA - a dedicated programme part. It has two components: widening participation and spreading excellence (widening) and reforming and enhancing the European R&I System (ERA). The ERA component is aligned with the Pact for Research and Innovation[278] and the ERA Policy Agenda[279], and aims to strengthen capacities of R&I actors in areas such as open access and gender equality (see dedicated sections above).

The widening Member States have a higher share of participations in collaborative projects under Horizon Europe than previously under Horizon 2020 (accompanied by a higher EU contribution). There is also a significant rise in the share of collaborative projects involving widening Member States – from 47% under Horizon 2020 to 58% under Horizon Europe.

Table 6: Collaborations, participations and funding by type of country (widening)

	Widening MS	Non-widening MS

[276] Innovative Europe study, 2024, chapter on internal coherence. https://data.europa.eu/doi/10.2777/499132.
[277] If one individual has been trained through two different courses (i.e. in two different deep tech fields), he/she is counted twice.
[278] https://european-research-area.ec.europa.eu/sites/default/files/2023-11/2021-11-26_council%20recommendations_pact%20for%20r%26i%20in%20europe.pdf
[279] https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

	Horizon Europe	Horizon 2020	Horizon Europe	Horizon 2020
Share of participations in collaborative projects	18%	15%	65%	73%
Share of EU contribution in collaborative projects	15%	11%	77%	82%
Share of collaborative projects involving country group	58%	47%	97%	96%

Source: CORDA as of 6 January 2025

Several widening actions continue from the previous framework programme: Teaming, Twinning, ERA chairs, and the grant provided to the European Cooperation in Science & Technology programme (COST)[280]. While funded under the WIDERA budget, some stakeholders noted that COST actions are not aimed at supporting a given group of countries, and therefore not ideally positioned under the widening objective[281].

One new initiative includes the Hop-on Facility, which allows research institutions from widening countries to join ongoing RIA under Horizon Europe Pillar II and EIC Pathfinder. As of January 2025, 140 research institutions from widening countries were selected for the Hop-on facility, joining collaborative projects with only non-Widening country participants. Approximately two-thirds joined Pillar II projects, the remaining ones being selected for the EIC Pathfinder. Stakeholders expressed appreciation for the concept, but lamented the strict eligibility criteria and difficulty in finding consortia that would include them in running projects, due to lack of contacts and possibly low awareness in non-widening countries[282].

What messages emerged from the stakeholder consultation?
67% of respondents (1 035) (strongly) agreed that Horizon Europe is **on track to strengthen the impact and attractiveness of the European Research Area**. This view is more widespread among respondents who are not EU citizens (85%; 28), than among those whose are (68%; 85). 70% of respondents from academia (557) and NGOs (44) also support the statement. 5% of respondents from academia (strongly) disagreed.

Widening actions are among the few collaborative research actions still funded by the programme that can be focused on low-TRL discovery research[283], often in the field of natural sciences, machine learning and artificial intelligence[284].

The European Court of Auditors has highlighted the difficulties faced by entities in widening countries in recruiting international staff due, for example, to the low attractiveness of a research career (and salary) in certain widening countries.[285] Under Horizon Europe, widening actions have increased their focus on fostering brain circulation across the ERA by facilitating the mobility of researchers, both across countries and across sectors. The ERA Fellowships provide a chance for unsuccessful applicants to the MSCA Postdoctoral Fellowships to carry out their research in a widening country. As of 2 December 2024, 267 researchers benefitted from the scheme. Local stakeholders appreciate these actions as they encourage mobility to widening countries[286].

Encouraging mobility and new collaborations is particularly important, as researchers in Widening countries are still less connected than those in non-widening countries, as evidenced by them seldom taking a central role in collaboration networks[287]. Almost 90% of beneficiaries

[280] https://www.cost.eu/. As of 2 December 2024, COST received EUR 273 million from the Horizon Europe budget.
[281] Excellent Science evaluation study, Annex I, p. 221. A list of 'inclusive target countries', not fully overlapping with widening countries, exists in COST: https://www.cost.eu/uploads/2022/06/COST-Action-Booklet-220607.pdf
[282] Excellent Science evaluation support study, Annex I, p. 218. https://data.europa.eu/doi/10.2777/9552959
[283] Excellent Science evaluation support study, p. 58. https://data.europa.eu/doi/10.2777/2295765
[284] Ibid, p. 61.
[285] ECA, Special Report 15/2022, par. 63-64. https://www.eca.europa.eu/en/publications?did=61346
[286] Excellent Science evaluation support study, p. 29. https://data.europa.eu/doi/10.2777/2295765
[287] Excellent Science evaluation support study, p. 32. Statement based on Horizon 2020 data, due to the very limited number of publications reported at this stage of Horizon Europe. https://data.europa.eu/doi/10.2777/2295765

of widening actions who responded to the evaluation survey found that their project creates or strengthens collaborations with leading research organisations[288]. Case study evidence also highlights the added value of Horizon Europe support to cross-border collaborations and networking, as there are no comparable grants available in widening countries[289].

Widening actions are not designed to have a significant direct effect on commercialisation of research results. Most widening actions focus on coordination and support, and are not expected to result in innovation outputs. Private for-profit entities (including SMEs) are underrepresented in these actions compared to most other parts of the FP[290]. Widening actions therefore have a relatively few programme newcomers (17.2% of all participants), as most new participants in R&I programmes come from the private sector. However, compared to Horizon 2020, efforts were made under Horizon Europe to include the private sector in actions such as the new Excellence Hubs, and in the first call dedicated to dissemination and exploitation launched in 2023[291]. As of 6 January 2025, 12.9% of participants in widening actions are from private for-profit entities compared with 2% at the end of Horizon 2020.

The European Court of Auditors highlighted that a sustainable improvement in FP participation in widening countries can only be achieved through higher national R&I investment levels and structural reforms. In 2022, of the 15 EU widening countries, only Slovenia and Czechia spent over 2% of GDP on R&D[292]. Widening actions aim to spur structural changes in the institutions, regions and countries involved, but the absence of a clear definition of structural changes in the context of the widening actions makes it difficult to monitor and evaluate their effects[293].

What messages emerged from the stakeholder consultation?

Stakeholders expressed their level of agreement on whether Horizon Europe is on track to **foster excellence-based participation from *all* Member States, including low R&I performing countries**. Among the 1 547 respondents, 67% (strongly) agreed (1 060) that this is the case. Respondents from academic or research institutions were the most positive (50%; 535), followed by companies (18%; 193) and EU citizens (11%; 120). Only 5% of respondents (73) indicated that they (strongly) disagree.

Horizon 2020's *ex post* evaluation found that national implementation plans were often not updated in response to the periodic feedback of the Policy Support Facility (PSF)[294]. Under Horizon Europe, PSF was strengthened thanks to a new service, PSF Open, aimed at providing support for the implementation of previous PSF country reviews. In 2023, the first two PSF Open exercises (for Romania and Greece) were carried out.

Under Horizon Europe the PSF has so far supported 32 Member States and associated countries, with Belgium, Austria and Romania being the most active participants. The 11 mutual learning exercises (MLEs) covered a range of topics such as the decarbonisation of industries, national policies for knowledge valorisation and the implementation of EU Missions.

A network analysis[295] shows that over one third of countries are connected through **researchers participating in Horizon Europe-funded projects**, and that **Pillar I is the Horizon Europe Pillar with the most globally connection**. Nevertheless, some flagship topics in Pillar II are key for the international positioning of the EU (e.g. those contributing to globally coordinated assessments such as the ones produced by the IPCC and IPBES). The most central countries (i.e. those with the highest population density) in the European research ecosystem under Horizon

[288] Excellent Science evaluation support study, p. 37. https://data.europa.eu/doi/10.2777/2295765
[289] Ibid, p. 57
[290] Source: Corda data on 2 December 2024.
[291] Excellent Science evaluation support study, Annex I, p. 219. https://data.europa.eu/doi/10.2777/9552959
[292] Eurostat, Source dataset: rd_e_gerdtot (2022 is the latest available year).
[293] Excellent Science evaluation support study, p. 34. https://data.europa.eu/doi/10.2777/2295765
[294] SWD (2024) 29, p. 88. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52024SC0029
[295] Excellent Science evaluation support study, 2024, Annex 6 'Quantitative research track findings'.

Europe are Germany, France, Italy and Spain. **Non-widening countries are generally more connected than widening countries.** Nevertheless, among widening countries, researchers from Greece, Portugal, Poland and Czechia are found to be **central to the European research ecosystem**[296].

The ERC plays an important role in making the EU research system more attractive to both European and non-European researchers. Interviews and stakeholders' position papers praise the size of the funding, the flexibility for ground-breaking research and the length of projects[297]. However, participation by the private for-profit sector remains limited.

The EIT Regional Innovation Scheme (EIT RIS) addresses the innovation divide in Europe through capacity building support which reached over 87 000 participants[298], created and supported over 2 500 ventures and launched 360 innovations on the market. A network of EIT hubs/offices and 887 partners has been created. Through this placed-based approach to innovation, the EIT bridges also towards relevant regional Smart Specialisation Strategies[299].

What messages emerged from the stakeholder consultation?

67% of respondents (1 035) (strongly) agreed that Horizon Europe is on track to strengthen and **increase the impact and attractiveness of the European Research Area**. Non-EU citizens were the most likely to agree or strongly agree with the statement (85%; 28) than EU citizens (68%; 85), and 70% of respondents from academia (557) and NGOs (44) supported the statement.

4.1.5. Exploitation and dissemination of results

In Horizon Europe, **focus is put on: (i) beneficiaries' *best efforts*** to exploit the results they own and to disseminate their results as soon as feasible; **and (ii) and the responsibility of the project consortium to disseminate and exploit results**[300]. Projects are requested to: (i) identify and to declare ownership of projects results in the reporting template; (ii) list their key exploitable results and (iii) prepare a plan for dissemination and exploitation during the project and after it ends. Previously, Horizon 2020 was found to fail reaching satisfactory levels of dissemination of scientific results within the scientific community and to policymakers[301]. Concerns were raised about the resources and skills required for dissemination and the need for continued knowledge management after the end of projects. Shortcomings in dissemination may contribute to a limited uptake of Horizon 2020 results[302].

The Commission provides the tools and services described below to address Horizon Europe beneficiaries' needs.

- The **Horizon Results Platform**, set up in 2019, provides a space for beneficiaries to raise the visibility of project results of Horizon Europe, its predecessors and other EU-funded

[296] In terms of the degree of centrality (how many connections each network node has), closeness centrality (how close each node is to others in the network), and betweenness centrality (how important a node is to the network information flow).
[297] Excellent Science evaluation study, Annex 1, p. 21, https://data.europa.eu/doi/10.2777/9552959
[298] By 2022, from the modest and moderate innovator countries according to European Innovation Scoreboard.
[299] Innovative Europe evaluation study, 2024, Annex 4, Case study 12, p. 272-280
[300] As per the Article 39 of the Horizon Europe regulation, each beneficiary that has received Union funding shall use its best efforts to exploit the results it owns, or to have them exploited by another legal entity. Exploitation may be direct by the beneficiaries or indirect through the transfer and licensing of results in accordance with Article 40. If, despite a beneficiary's best efforts to exploit its results directly or indirectly, the results are not exploited within a given period as established in the grant agreement, the beneficiary shall use an appropriate online platform as identified in the grant agreement to find interested parties to exploit those results. The beneficiaries are best placed to maximise the impact of their own research by communicating, disseminating, exploiting during the project's lifetime and after the project's completion.
[301] Green Transition evaluation study supporting the final evaluation of Horizon 2020 (2023), Section 3.1.5.2.
[302] Resilient Europe evaluation study supporting the final evaluation of Horizon 2020 (2023), pp. 41, 129. Annex V.

programmes. Beneficiaries who, despite their best efforts, have not succeeded in exploiting their results are required to disseminate their key exploitable results via the Platform.

From 2020 to 2022, the Horizon Results Platform saw an increase in visitors from 21 283 to 37 650 and showcased a total of 3200 key exploitable results, 65 coming from Horizon Europe[303]. The platform also supports networking and pitching events in collaboration with organisations representing early-stage investors. However, there is a difficulty in enforcing the requirement to disseminate results on the Platform as this step is taken at the end of the grant agreement.[304].

- The **Horizon Results Booster-I** (2020-2024) and the improved Horizon Results Booster-II (from 2024) also provide free support and guidance services to beneficiaries for disseminating and exploiting their results. Between September 2020 and September 2024, the Horizon Results Booster-I delivered 1 521 services: 938 on the portfolio dissemination & exploitation strategy (PDES), 285 on business plan development (BPD) and 298 go-to-market services (G2M - innovation management, pitching, intellectual property support, feasibility studies, start-up support)[305]. There were 78 requests for IPR services, which provide support to beneficiaries in clarifying intellectual property and non-disclosure agreements, especially for collaborative ventures and spin-offs. Feedback from interviews about these services was positive, but there is scope for more beneficiaries to use these services[306].
- The **EIC's Business Acceleration Services** provided non-financial support to over 4 000 companies and innovators to connect with procurers and investors, helping to increase their likelihood of market entry and up-scale EIC-funded innovation. They facilitated 440 introductions to corporates, public and private procurers resulting in follow-ups (with over a quarter resulting in a commercial contract including for example the deployment or integration of a product).
- **CORDIS** (Community Research and Development Information Service) is the European Commission's primary source of results from EU-funded research projects, spanning FP1 to Horizon Europe. Having attracted over 6.5 million visitors in 2024, it offers a structured public repository with project factsheets, participants, reports, Intellectual Property Rights, and links to open-access publications, along with articles, videos and podcasts in six languages. Projects are classified by scientific fields using the European Science Vocabulary Taxonomy (EuroSciVoc).

The evaluation also found a variety of project activities that were carried out to engage the public and end users in projects – a summary is provided in Annex 9.

What messages emerged from the stakeholder consultation and beneficiaries survey?

The beneficiaries' survey, which was carried out between May and July 2023, highlighted an improvement compared with the results of the previous stakeholder consultations. Approximately 63% of respondents report that the Commission platforms and measures (e.g. Horizon Results Booster, Horizon Results Platform, IPR Helpdesk) help facilitate the uptake of projects' research findings to a (very) large extent.

According to stakeholders, the most helpful Commission-related exploitation services in view of dissemination, exploitation and access to research and innovation results are CORDIS (75%; 1 524), the Horizon Dashboard (59%; 1 517), the Horizon Results Platform (55%; 1 514) and the Horizon Results Booster (48%; 1 520).

[303] Typically, Key Exploitable Results become available towards the end of a project's lifecycle, with many Horizon Europe projects still ongoing, particularly RIA and IA, results will not become available until more projects conclude.
[304] Green Transition evaluation study, 2024, section 14.4.2. https://data.europa.eu/doi/10.2777/67934.
[305] HRB services are available to beneficiaries of Horizon Europe and its predecessors (Horizon 2020 and FP7). The figures represent all services provided. For Horizon Europe specifically, data estimates are 192 for PDES, 44 for PD, and 85 for G2M, including 29 for IPR services.
[306] Green Transition evaluation study, 2024, Section 14.4.2. https://data.europa.eu/doi/10.2777/67934.

Excluding 'I do not know / no opinion' replies, the Horizon Results Platform is appreciated the most by NGOs (97%; 34), public authorities (92%; 44) and companies (91%; 139)[307]. Similarly, the Horizon Results Booster is best received by business associations (100%; 20), followed by NGOs (97%; 32) and companies (88%; 118)[308].
Besides Commission platforms, 55% (832) of respondents to the public consultation indicated that they (strongly) agree that **patents** helped to disseminate, exploit and give access to research and innovation results. 41% of respondents from business associations (15) and 32% of companies (82) indicated that patent filing fosters dissemination and exploitation of results 'to a great extent'.

4.2 Efficiency

The first part of this section assesses the costs of Horizon Europe by stakeholder group, complementing the benefits presented in the previous section. It then reports on the administrative targets set, assesses the programme's value for money, looks at how simplification measures (aimed at efficiency savings) have performed so far and discusses the areas for further simplification.

A public sector evaluation considers costs to society, including those incurred by programme participants. As a centrally managed programme, Horizon Europe is in the exceptional situation of not only recording its current administrative and operational expenditure but also being in direct contact with its participants. Through a particular emphasis on the detailed quantitative assessment of the costs for applicants and beneficiaries, this interim evaluation hopes to contribute to a better understanding of large EU funding programmes' cost characteristics[309].

4.2.1 Costs of Horizon Europe by stakeholder group

1. The cost of investment in R&I at EU level is covered by Horizon Europe's **operational expenditure** budget of **EUR 88 322 million**[310]. It is the programme's main input cost, incurred by EU society and funded mainly through the Union's budget. Until the end of 2024, **EUR 56 561 million**[311] have been **committed** and **EUR 30 883 million**[312] have been **paid out to beneficiaries**[313].

2. Horizon Europe's administrative expenditure budget of **EUR 5 623 million** is the **EU Public Sector's administrative costs** and is funded mainly through the EU budget. Until the end of 2024, **EUR 3 317 million**[314] have been **committed** and **EUR 3 174 million**[315] have been paid out[316].

3. Beneficiaries incur **administrative costs** to fulfil specific requirements to manage their projects, set out in their grant agreements, that they would otherwise not have spent. While beneficiaries are compensated for all administrative costs through grant payments, any avoidable

[307] The Horizon Results Platform helped: (1) to a great extent, (2) somewhat, (3) a little.
[308] The Horizon Results Booster helped: (1) to a great extent, (2) somewhat, (3) a little.
[309] The findings reported in this part of the evaluation are based on the analysis in annex 4 (Efficiency).
[310] Horizon Europe's budget (2021-2027), including different sources of the budget is discussed in section 2.1.
[311] This includes EUR 52 251 million, or 59.2%, of the voted budget including NGEU funds, plus EUR 4 310 million in internal and external assigned revenues.
[312]This includes EUR 29 574 million, or 33.5%, of the voted budget including NGEU, plus EUR 1 308 million in internal and external assigned revenues.
[313] Direct point for comparison not available for Horizon 2020 and FP7 not available. Close point of comparison: 38% of the total Horizon 2020 budget committed in the first three years of the programme.
[314] This includes EUR 2 978 million, or 53.0%, of the voted budget including NGEU funds, plus EUR 339 million in internal and external assigned revenues.
[315] This includes EUR 2 875 million, or 51.1%, of the voted budget including NGEU funds, plus EUR 299 million in internal and external assigned revenues.
[316] Comparable figures for the first three years of Horizon 2020 and FP7 are not available. The committed total Horizon 2020 budget share of the first three years is dominated by the operational expenditure.

part of the effort generated by the framework programme's requirements reduces its overall efficiency.

About half of the beneficiaries agreed to some extent that 'project reporting requires reasonable effort and costs', while 14% disagreed[317]. **Around 40% of the beneficiaries experienced project management and implementation in Horizon Europe as neither simpler nor less simple than in Horizon 2020,** while 28% found it at least somewhat simpler and 9% less simple than before[318].

The evaluation collected robust quantitative evidence on **beneficiaries' administrative costs as share of their total project costs**[319]. These costs cannot be interpreted as pure 'administrative burden' as they are likely to cover tasks that would have been associated with running the projects in any case. For almost all programme parts, the median and the most common responses indicated that **6% to 10% of the project budget is allocated to administrative tasks**[320]. This result also holds for the median consortium-run project, while median coordinators, when considered separately, reported a higher range of 11% to 15%. Mono-beneficiaries (Pillar I and III, as well as SME respondents) also typically face administrative costs equal to between 6% and 10% of the project budget.

At the level of programme parts[321] in total, for **all projects signed under Horizon Europe so far**, **beneficiaries are expected to spend between EUR 4.75 billion and EUR 6.47 billion in administrative costs** over their entire project lifetime. This is equivalent to 9% - 12% of the total project cost signed so far. This estimated total cost is already an order of magnitude higher than the estimate of the final Horizon 2020 evaluation (EUR 135 million to EUR 215 million over the entire framework programme). The differences are likely driven by improvements in data quality and a change in the design of the survey questions rather than actual underlying changes in beneficiaries' administrative costs[322,323].

4. Successful and unsuccessful applicants, the largest stakeholder group of Horizon Europe, incur **application costs** when preparing and submitting their proposals. Application costs are one of the programme's costs on EU Society and have an effect on its value for money. They are partially unavoidable as quality proposals require effort up front to allow for the most promising projects to be identified, which in turn maximises the chances of generating higher benefits for society. However, the application costs have the potential to introduce inefficiencies into the programme[324].

For around 40% of applicants, the overall effort to prepare a proposal is 'acceptable', while a quarter disagreed[325]. Applicants also suggest there has been **no substantial shift in the**

[317] '*Project reporting requirements require reasonable effort and costs'* 12% (727) strongly agree, 40% (2455) rather agree, 22% (1378) neither agree nor disagree, 11% (668) rather disagree, 3% (187) strongly disagree, 13% (793) do not know / not applicable.

[318] '*Project management and implementation (…) is simpler in Horizon Europe than in HH2020.* (n = 3286); 5% (150) strongly agree, 23% (760) rather agree, 41% (1350) neither agree nor disagree, 7% (245) rather disagree, 2% (59) strongly disagree, 22% (722) do not now/ not applicable.

[319] 5 161 responses (excl. 'do not know'), targeted survey. Further discussion and questions, in Annex 4.1.1.

[320] For programme parts deviating from this pattern, and additional details on administrative costs, see Annex 4.1.1.

[321] Using the shares of respondents (who selected each administrative cost range) as a weight, the ranges themselves, and the aggregated total project cost by programme part, excluding EIT. See also Annex 4.1.1.

[322] The Horizon 2020 estimate was less robust but was also based on a more granular question. See Annex 4.1.1.

[323] Beneficiaries' administrative costs are targeted by simplification measures, discussed in section 4.2.3, with potential for further simplification covered in section 4.2.4

[324] As the total number of applicants is very high and the vast share of applicants is unsuccessful, a small avoidable burden in the application process has the potential to introduce a sizeable inefficiency into the programme.

[325] to a 'large extent' (32%, 5 443), 'very large extent' 10% (1733), while 32% are moderately supportive and 24% (4254) effectively did not find it acceptable. (See Annex 4.1.2.1)

proposal preparation effort required to apply for Horizon Europe funding compared with Horizon 2020[326,327]

Relative to the **complexity of the proposed projects, 60% of applicants**[328] **find the overall application effort proportionate**. Just over half of the applicants consider their effort proportionate to the **number of consortium partners involved**[329] and to **the size of the grant**[330,331]. However, when comparing the proposal preparation effort to **the chances of success, 44% of applicants consider their application costs disproportionate** and only a third of applicants still rate the effort as proportionate[332]. A further breakdown of the responses by programme part reveals some variation, with EIC and ERC applicants being most affected[333]. Additional feedback submitted to the survey's open questions and the public consultation similarly raise strong concerns about the absolute level of effort required in light of the chance of success[334]. **Taken together, despite the increased success rates and budget of Horizon Europe, there is strong qualitative evidence that for a substantial share of applicants the application cost is not proportionate to their chances of securing Horizon Europe funding**.

The evaluation substantially improved the available quantitative evidence on proposal preparation costs of R&I framework programmes[335]. Proposal preparation costs of consortia (multi-beneficiary grants) combine the costs of coordinators, shouldering most of the effort, with those of contributing partners. Overall, the **median consortium coordinator** spends between **36 to 45 person-days per proposal.** The effort for contributing **consortium partners** is typically lower, spending **16 to 25 person-days**[336].

The median effort required by **mono-beneficiaries** (ERC and MSCA PF, as well as for EIC Accelerator[337]) **is comparable to that of coordinators, at 36 to 45 person-days**[338]. Although mono-beneficiaries do not have to coordinate partners during the proposal preparation phase, they are required to fulfil most of the same steps as coordinators. However, mono-beneficiaries are diverse. In the case of the EIC Accelerator, proposals apply for substantial grants and equity budgets through pitching decks and full business plans, which can be used for investment commercialisation purposes beyond the EIC. This is also reflected in the comparatively high share (26%) of EIC Accelerator applicants, particularly successful ones (43%), who reported very high application costs of over 65 person-days.

The time spent on proposals is influenced by metrics that relate to the size of the project. More than the size of the grant, **the consortium size is a dominant factor influencing the time cost of coordinators.** According to the survey, the effort increases in steps, by about **10 person-days for every additional 15 partners**, pointing to the key role of coordination costs already at the application stage. Proposals for **projects of a longer duration** also take coordinators **more time**

[326] This finding is supported by the targeted consultation, as well as responses to the public consultation. For details, see Annex 4.1.2.1 (costs of applicants - qualitative evidence), Figure 11.
[327] Ineligible proposal rates, at 3.5%, are higher than in Horizon 2020, which could be linked to complexity.
[328] 45% 'to a large' (7 801 respondents) and 15% 'to a very large' extent (2 596 respondents)
[329] 44% 'to a large' (5 337 respondents) and 12% 'to a very large' (1 495 respondents)
[330] 13% 'to a large extent' (2 200 respondents) and 40% 'to a very large extent' (6 885 respondents).
[331] In all three cases a minority consider the costs disproportionate. Complexity: 13% (2283), consortium partners: 12% (1479), size of grant: 17% (2872) (See Annex 4.1.2.1 Figure 12)
[332] (6761 respondents); 34%: 24% 'to a large extent' (4 051) and 10% 'to a very large extent' (1759).
[333] See Figure 13, Annex 4.1.2.1
[334] See Annex 4.1.2.1 and Section 4.2.4.
[335] Based on 17 254 responses of unsuccessful and successful applicants to a targeted survey question, sent to the population of applicants, matched to data on applicants. For further discussion and question, see Annex 4.1.2.3.
[336] Co-ordinators' mode at 'above 65 person-days'. Partners' result: median and mode; Finding holds across most characteristics, but not for consortia of > 30 partners, where partners spend 6 - 15 person-days (median and mode).
[337] For a further split by action, please refer to Annex 4.1.2.2.
[338] Mode ERC applicants (20%), equally reported very high application costs of 'more than 65 person days'.

to prepare. Projects of **up to two years** see coordinators typically investing **26-35 person-days**, whereas those of two to four years typically take **36-45 person days**. Costs vary by the type of funding instrument, with higher costs associated with those instruments with the higher grant amounts, larger consortia and longer projects.

Proposal preparation costs vary based on the applicants' experience and their skill sets. **Experienced applicants spent more tim**e on their proposals than first-time applicants. Applicants who **used consultancies** (but were not consultancies themselves) typically took **about 10 person-days more**. This increase was not observed for consultancies acting as coordinators, whereas consultancies who contributed as consortium partners even typically reported spending about 10 person-days less than the average. **Coordinators that prepared proposals that ended up securing funding typically had spent more time** than those whose proposals were unsuccessful. For further details and analysis of the results, see Annex 4.1.2.2.

Analysing the median number of days dedicated to the application process, breaking down the data by applicant role and the size of their consortium, **it is estimated that the total application cost for Horizon Europe so far reaches between EUR 1.92 billion and EUR 2.82 billion**[339]. This corresponds to an **average cost per proposal of EUR 21 000 to EUR 32 000**, or EUR 34 000 to EUR 50 000 per EUR 1 million of committed operational expenditure. Our level of confidence in the order of magnitude of these new estimates is high, due to the improved source of evidence and a more robust and granular estimation approach.

These estimates are based on Horizon Europe's committed operational expenditures up to 2024, therefore not covering the entire programme. When projected to the total expenditure of the programme, the estimated total application cost of Horizon Europe is expected at the end to amount to EUR 3.1 to 4.5 billion. In comparison, the Horizon 2020 final evaluation estimated that the average cost of a proposal fell between EUR 18 000 and EUR 37 000, which corresponds to EUR 79 000 to 158 000 per EUR 1 million of operational expenditure. The estimate of the Horizon 2020 final evaluation was not robust. **Differences between the estimated application cost for Horizon 2020 and Horizon Europe should not be interpreted as a change in the actual underlying costs.** It will be possible to assess a change in the costs of applicants in the interim evaluation of the next framework programme.

While around **30% of Horizon Europe applicants prepared their proposals without any support,** around **50%** received help from a **dedicated department in their organisation**, around **20%** received support from a **National Contact Point (NCP)** and **17%** commissioned support from a **consultancy or expert** (inside or outside the consortium)[340]. Comparatively high shares of applicants used **consultancies** in **Pillar III** (46%), particularly the **EIC Accelerator** (67%), and to some extent also in Pillar II Cluster 1 (28%). **Innovation Action** applicants had the highest shares using external consultancies (24-36%)[341]. Quantitative survey evidence[342] suggests that the **median consultancy fee** is **EUR 7 500** for **consortia** proposals, **EUR 2 000** for **mono-beneficiaries** and **EUR 12 000** for **EIC Accelerator** proposals.

The use of external or internal consultancies or an internal department in the proposal preparation process, does not necessarily indicate programme inefficiencies. Applicants make their choices based on their skill set, value of time and available resources. Concerns can arise where participation effectively depends on the use of costly support. Given the figures above and that

[339] Excluding EIC Accelerator applications, due to low quality monitoring data. For the detailed methodology and findings, see Annex 4.1.2.

[340] Survey responses: 'No support': 29% (2 141 responses), internal department: 51% (3688), NCPs: 19% (1397), consultancies: 17% (1252). Multiple selection possible. For the survey question and further details in Annex 4.1.2.3.

[341]Resilient Europe study Annex 1.3.3. Estimate based on survey responses matched with monitoring data.

[342] 658 survey respondents. Fees paid to external consultancies for proposal preparation and related advice can be understood as a monetisation of parts of the application costs, reducing the number of person-days that applicants would otherwise have spent. For the survey question and a further breakdown, see Annex 4.1.2.3.

the overwhelming majority **(74-80%) of Horizon Europe proposals above the quality threshold are written without the involvement of external consultancies**[343]**,** this does not seem to be generally the case, although it may apply to specific programme parts.

4.2.2 Performance against administrative targets & value-for-money of Horizon Europe

Administrative efficiency of the EU public sector

Two types of quantitative performance targets[344] set out expectations about the administrative efficiency of the EU public sector managing Horizon Europe: (i) the administrative time performance targets; and (ii) the share of administrative expenditure overall.

(i) The evaluation assessed Horizon Europe's performance in meeting time-based targets[345]. According to the **time-to-grant (TTG) target**[346], each grant agreement (except for ERC calls)[347], has to be signed **eight months** (245 days) after the proposal submission deadline. Under Horizon Europe, this target has been met so far, even though as of January 2025, with an **average time-to-grant period** of **240 days**, Horizon Europe lags behind Horizon 2020's average overall performance (187 days). **77% of grants have been signed on time**, compared to 90% under Horizon 2020 and 41% under FP7. Across programme parts, times-to-grant vary between **Widening and ERA (230 days, 88%**) and **Pillar II (244 days, 87%**).

Horizon Europe without the EIC reaches a TTG of 241 days (240 days when excluding EIC Accelerator only), staying behind the performance of Horizon 2020 without SMEI (209 days) but still on the target[348]. Horizon Europe's TTG performance fluctuates month by month. The above values report the average values on 6 January 2025.

(ii) Horizon Europe's **administrative expenditure** has been set a **maximum ceiling of 5%** of overall expenditure[349]. The ceiling definition only considers expenditure drawing on certain budget sources (only the budget in the legal base) and the expenditure linked to indirect research, which excludes the JRC. Based on this definition, Horizon Europe's administrative expenditure meets the 5% ceiling: to date it reaches **4.01%**[350].

Value for money of Horizon Europe

The costs and benefits reported in the evaluation are used to assess Horizon Europe's societal value-for-money by calculating an approximate **public sector benefit cost ratio (BCR)**. Conceptually, this metric relates the total welfare benefits of the programme to the total cost associated with it[351]. The closest available proxy for a total welfare benefit of Horizon Europe are the macro-economic forecasts of its long-term GDP impact (Section 4.1.3). Quantified benefits other than GDP (e.g. number of patents, effects on employment) are not added again to avoid double-counting. The EU public sector's (already committed) expenditure and the

[343]Resilient Europe study, Annex 1.3.3. Estimate based on survey responses matched with monitoring data.
[344] It is too early in the programme to assess the error rate of the framework programme.
[345] Time to inform, time to sign, time to pay data, as well as breakdowns of time to grant in Annex 4.2.
[346] TTG is set out in Article 31 of the Horizon Europe Regulation, by derogation from Article 197 (2), the time to grant is 8 months from the deadline for submission of the proposals.
[347] ERC: TTG may exceed the target if justified (e.g. complex actions, many proposals, and request by applicants).
[348] The evaluation did not find international benchmarks for TTG, with available targets focussing mainly on the proposal evaluation phase (time-to-inform). See Annex 4.2
[349] Regulation (EU)2021/695, Article12(6).
[350] Expenditure data extracted on 21 November 2024.
[351] The difference between a (public sector) benefit cost ratio of a programme and a (private sector) return-on-investment is that the BCR takes the wider perspective of EU society and should include all costs and benefits that affect welfare. A BCR of 1 (break-even) indicates that each euro of costs that the programme generated welfare benefits equivalent to one euro.

estimated incurred total cost of applicants (both Section 4.2.1) make up the total cost. Beneficiaries' administrative costs are compensated by grants and therefore not added again.

While the costs associated with Horizon Europe are incurred early on, its benefits only emerge over a long period of time. A meaningful assessment of the overall benefit-cost relationship at this point thus has to involve forecast benefits that have not yet materialised. To anchor the forecast to evidence on the programme's performance at interim stage, the evaluation only considers the GDP effect that is expected from R&I activities, for which grants have already been signed. Two macro-economic forecasts are used, leading to two very similar ratios.

Based on the above, the **benefit cost ratio** (dividing total benefit by total cost) reaches a value between 5 and 6, consistent with a high value for money that reflects the potential of R&I support to generate substantial benefits over a longer time horizon. This suggests that **one euro of costs to EU society associated with the programme (programme costs and costs to applicants) is estimated to bring about 5 to 6 euro of benefits for EU citizens (measured through GDP impact) in the period up to 2045** (25 years)[352].

4.2.3 Performance of Horizon Europe's simplification measures

Rationalisation of the European Partnership landscape

The interim evaluation of Horizon 2020 found that the partnership landscape had become excessively complex over time, failing to adequately align with policy objectives at EU and national level[353]. Under Horizon Europe, the number of partnerships was therefore initially reduced to 49 from 120 under Horizon 2020. This number later increased to 50 after extension of the Partnership on Research and Innovation in the Mediterranean Area (PRIMA)[354]. Furthermore, during the 2025-2027 period, 10 new partnerships will be launched[355,356], bringing the total number to 60. The types of partnership were limited from 7 to 3, namely co-funded, co-programmed and institutionalised partnerships. The selection process of co-programmed and co-funded partnerships was integrated into the strategic planning process of Horizon Europe[357] with the expectation that this would support the reorientation towards EU priorities and enable an impact-driven approach. The number of partnerships is increasing again in Horizon Europe: the strategic plan for 2025-2027 announced nine new co-funded and co-programmed partnerships[358]. While the rationalisation primarily affected public-private partnerships, new additions involve the private sector.

The closer integration of partnerships into the programme has had some effects: evidence from two evaluation support studies[359] suggests that some **areas covered by partnerships are now better coordinated**. This has in turn led to a substantial increase in public funding from EU Member States and a stronger collaboration at programme level. Respondents to the public consultation provided positive feedback on the streamlining of partnerships. Overall, 53% (472) of respondents 'agreed' or 'strongly agreed' that 'the rationalisation of European Partnerships

[352] The Impact Assessment of Horizon Europe did not include a benefit cost ratio as point for comparison.
[353] Council Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, Recital (4).
[354] https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/european-partnership-research-and-innovation-mediterranean-area-prima-has-been-successfully-extended-2024-04-19_en
[355] https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/6abcc8e7-e685-11ee-8b2b-01aa75ed71a1
[356] https://education.ec.europa.eu/news/new-eit-knowledge-and-innovation-community-will-focus-on-water-marine-and-maritime-sectors-and-ecosystems
[357] SWD(2018)307final, 2/3 - p. 111. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018SC0307
[358] Strategic plan for 2025-2027, p. 33.
[359] Digital and Industrial Transition evaluation study, 2024, Section 9, https://data.europa.eu/doi/10.2777/845650 and Green Transition evaluation study, 2024, Section 12.3, https://data.europa.eu/doi/10.2777/797281.

had allowed additional public and private investments in R&I to be leveraged' [360]. In addition, 49% (435) of respondents 'agreed' or 'strongly agreed' that 'the rationalisation of European Partnerships has led to delivering more solutions for the benefits of society, the environment, and the economy'[361].

The integration of different communities from the previous partnerships has, however, not yet been completed[362], and the **monitoring of partnership results faces challenges**, not least as far as additional activities are concerned (private investments outside the programme but contributing to the objectives of the partnership)[363]. Some partnerships have just recently been set up and are still drawing up their KPIs. Others find it difficult to identify suitably flexible KPIs, which would enable them to incorporate new innovation approaches. They also have difficulties in coordinating their monitoring frameworks with that of Horizon Europe and with the reporting standards of projects[364]. In addition, four partnerships reported that monitoring arrangements have given rise to disproportionate administrative costs for partners and project participants[365]. The fragmented monitoring of partnerships, and in some cases reliance on ad hoc reporting exercises, has had a negative effect on the extent to which partnership performance could be evaluated [366]. An assessment of the administrative costs (running costs) of institutionalised partnerships can be found in Annex 4.4.1.

Lump sum funding

Lump sum funding is a simplification measure that removes financial reporting requirements, which reduce the reporting burden on beneficiaries (and saves them administrative costs). Lump sum grants also help to avoid financial errors and contribute to a shift of focus during the grant implementation stage away from financial controls and back to a project's content.

Under Horizon Europe, the use of lump sum grants has been gradually extended, building on previous, generally positive assessments[367]. As of 1 January 2025, a total of **1 582 lump sum grants have been signed for a total value of EUR 3.03 billion**, of which 706 ERC Proof of Concept (PoC) grants (EUR 106 million) and 876 lump sum grants (EUR 2.93 billion) in other programme parts[368].

Lump sum funding has prompted stakeholder reactions. Positive feedback welcomes the reduction in reporting burden and stresses the simplification for new beneficiaries. Concerns, particularly from some larger beneficiary organisations, centre on the topics of application costs,

[360] Percentage after excluding responses of 'I do not know'. In comparison, 31% 'neither agreed or disagreed', and 17% 'disagreed' or 'strongly disagreed'.
[361] 16% 'disagreed' or 'strongly disagreed' and around a third of respondents (34%) 'neither agreed or disagreed'. See section 'Effectiveness of the EU Missions and European Partnerships' in Annex 5 Stakeholder consultation.
[362] Digital and Industrial Transition evaluation study, 2024, Section 9, https://data.europa.eu/doi/10.2777/845650
[363] Based on 18 out of the 39 partnership evaluation reports.
[364] Evaluation of the EIT Climate-KIC, Section 8; European Partnership – Towards zero-emission road transport (2ZERO), Section 4.7; European Partnership on Connected and Automated Driving (CCAM), Section 4.10.
[365] Evaluation of EIT Health, Section 4.5, 2024. https://data.europa.eu/doi/10.2777/049770; Evaluation of the Partnership 'People Centric Sustainable Built Environment', Section 3.3; Evaluation of the European Partnership Clean Aviation Joint Undertaking, Section 4.3, 2024, https://data.europa.eu/doi/10.2777/403632; Evaluation of the European Partnership on the Assessment of Risks from Chemicals, 2024, directionality section, https://data.europa.eu/doi/10.2777/001851.
[366] Annex 7 highlights several monitoring limitations across different types of partnerships, in particular data discrepancies across several resources and limitations of internal reporting for institutionalised partnerships, uncertainty of pledged funding by Members States and their source for co-funded and reporting confidentiality and validation of additional activities for co-programmed partnerships.
[367] See Section 4.2.3 and Annex 4 of the Final Evaluation of Horizon 2020 (2023), Assessment of the Lump Sum Pilot (2018-2020), October 2021.
[368] A detailed description of the state-of-play of lump sum funding, covering the entire lifecycle of grants as of early 2024 can be found in: Assessment of lump sum funding in Horizon 2020 and Horizon Europe, September 2024.

financial risk and amendments to grant agreements[369]. Extensive quantitative and qualitative evidence, allow to estimate the benefits from removing financial reporting costs achieved so far, analyse changes in application costs and to the EU public administration processes, as well as assess the existence of potential unintended side-effects.

A 2024 assessment[370] of targeted survey responses suggests that a large majority of beneficiaries of lump sum funding, across programme parts, perceived a **reduction in administrative burden** and an **improved focus on project content**[371]. Lump sum grants are **particularly welcomed by beneficiaries of grants of up to EUR 10 million and with a consortium size of up to 20 participants**[372].

Implementation data suggest that lump sum grants **do not interfere with the proper functioning of R&I projects**. The rate of grant reduction in closed lump sum grants has stayed under 1%, irrespective of the budget size of the grant, indicating that **a beneficiary's risk of not completing a lump sum project remains low**.

The evaluation **quantified the simplification benefits of lump sum grants** from removing all financial reporting requirements. Two targeted surveys [373] returned very similar **median financial reporting cost savings of lump sum grant beneficiaries of between 6 and 8 person-days per reporting period and consortium member**[374].

Given the characteristics of the lump sum grants signed so far, beneficiaries (excl. ERC PoC) are expected to **reduce the time spent on reporting** by between **96 and 128 person-days per grant over the project lifetime** (median saving). This corresponds to a typical simplification benefit of around **EUR 33 200 to EUR 44 200**[375] **per grant**, equivalent to around **1.4% to 1.8% of the grant value**, or between **12% to 27% of the beneficiaries' administrative cost**[376].

The burden reduction per ERC **PoC mono-beneficiary** is estimated to amount to between **6 - 8 person-days**, or between **EUR 1 800 to EUR 2 500** (1.2%-1.6% of grant value; 12%-20% of administrative cost) over the project lifetime.

In addition, lump sum grant beneficiaries save the costs of a **certificate on the financial statements (CFS)** for EU contributions above EUR 430 000, which typically costs **EUR 4 500**, equivalent to around 0.3% of the grant value[377].

At interim evaluation stage, adding up administrative time savings (reporting burden reduction) and avoided CFS certificates, and **only considering the grants (including ERC PoCs) that have been signed to date**, lump sum funding is estimated to so far have secured savings for

[369] Concerns about unintended side-effects so far are not confirmed by implementation data. For assessment see Annex 4.4.2 (Costs and side-effects of lump sum funding).
[370] Assessment of lump sum funding in Horizon 2020 and Horizon Europe, September 2024. This assessment also addresses recommendation 5.1.a from the European Court of Auditors (ECA Annual Report 2022) to evaluate the use of lump sums, which the Commission committed to cover in the mid-term evaluation of Horizon Europe.
[371] See Annex 4.4.2, Figure 20: Overall satisfaction with lump sum funding.
[372] See Annex 4.4.2 for more findings and additional detail.
[373] Targeted surveys summer 2024. Please refer to Annex 4.4.2 for detailed reporting on surveys and results.
[374] 1 529 actual cost grant beneficiaries reported median financial reporting costs of 6 person-days per reporting period and consortium member. 210 lump sum grant beneficiaries, with past experience of actual cost grants, reported a median administrative cost saving of 8 person-days per reporting period and consortium member. The assessment uses the range of the two median values. Additional information in Annex 4.4.2.
[375] Monetisation uses a median personnel cost value, which is a sector-specific cost of labour of Horizon Europe beneficiaries, reflecting the opportunity cost of the project team's time that would have been spent on preparing financial reporting. For more information see Annex 4.4.2 (Quantitative assessment of lump sum benefits).
[376] Including Proof of Concept lump sum grants does not change the range of 12% - 27%.
[377] Based on 634 (non-zero) responses of actual cost grant beneficiaries. Percentage calculated based on the total grant value of all lump sum grants signed so far.

beneficiaries of between **EUR 49.8 million and EUR 63.4 million**[378] over their project lifetime. This sum is **equivalent to between 1.6% and 2.1% of the total grant value of lump sum grants so far and to between 14% and 30% of beneficiaries' total administrative costs**. These values do not yet include the savings of lump sum grants to be signed during the remaining years of Horizon Europe, which are discussed in Section 4.2.4.

Beneficiaries' survey responses suggest the overwhelming majority[379] of lump sum beneficiaries has discontinued at least some of the tasks, which means that that lump sum funding already contributes to a reduced administrative burden in practice. The full savings potential might take some time to materialise. Organisations may choose not to (fully) adapt their financial management practices, particularly in the short-term. However, regardless of the extent of their adaptation, the removal of the financial reporting requirements themselves is already a reduction of the administrative burden on beneficiaries generated by the programme as beneficiaries are no longer constrained and are free to organise themselves in the most efficient way.

All Horizon Europe applicants, regardless of funding model, must base their proposals on detailed cost estimates, which they are required to keep on file. Applicants for lump sum grants (excluding ERC PoC) must submit an **additional 'budget table'**. Compiling the budget information for the table is not an additional task but included in the baseline cost of applicants. What changes for lump sum proposals is that **applicants must enter and submit their figures into a specific template**, currently in the form of an excel spreadsheet, instead of keeping the information at hand in a format of their choice under actual cost grants. Survey responses of lump sum beneficiaries suggest that, so far, the additional application costs do not raise any concerns or are negligible. **The available quantitative and qualitative evidence**[380] **on lump sum applicants' proposal preparation costs so far gives no cause for concern about the size of this additional cos**t.

The use of lump sum funding requires an adaptation of internal administrative processes in implementing bodies, such as executive agencies and joint undertakings, which alters the public sector's administrative costs, particularly in the short run. Financial reporting documents no longer have to be processed, which generates cost savings from simplification. At the same time, a greater emphasis is placed on the content of the supported projects, the additional 'budget tables' have to be assessed, some workflows of the implementing bodies have to be adjusted, and staff have to become familiar with changes to the implementation practices[381].

Blind evaluation of proposals

A 'blind evaluation' of proposals has the potential to improve the evaluation process by safeguarding it against the possible biases of the evaluating expert. As the evaluator does not receive information from which they can infer the identity of the applicants it supports an assessment, which is fair and based solely on the quality of the proposed project. While not a 'simplification' measure as such, the measure can contribute to a better functioning of the framework programme.

Following a request by Member States, blind evaluations were piloted in the evaluation process of proposals submitted in the first stage of 16 of the 17 two-stage calls of the 2023-2024 Horizon Europe work programme (with the exception of one 'widening' call). Extensive feedback

[378] Of which administrative cost savings of EUR 1.3-1.7 million stem from PoC and EUR 33.8 million to EUR 45.0 million from other programme parts. The total saving from CFS amounts to around EUR 7.56 million, based on 1680 (1.12.2024) lump sum participations above EUR 430 000, who would have had to submit a CFS.
[379] Based on 89% (267) of LS respondents to a corresponding survey question, see Annex 4.4.2 for further detail.
[380] For more details on application cost see Annex 4.4.2 (Costs and side-effects of lump sum funding) and the Assessment of lump sum funding in Horizon 2020 and Horizon Europe (2024).
[381] See also Annex 4.4.2

collected as part of the pilot suggests that evaluators perceived no additional effort. Applicants spent some extra effort to anonymise their proposals[382] but viewed the measure as a general improvement. In particular, National Contact Points of widening and third countries welcomed the measure. The call coordinators, part of the EU public administration, reported an increase in the time they spent on 'admissibility checks'[383] to make sure that applicants could not be identified in the proposals and voiced concerns about the additional workload[384].

The pilot confirmed that the **blind evaluation of proposals is feasible within the legal framework and the operational context of the R&I framework programme**[385]. Although not set up as a policy experiment[386], the pilot monitored indicators on geographical coverage and gender, before and after the first stage evaluation. It observed that the share of participations from 'widening' countries that passed the first stage evaluation decreased less in blind evaluations, namely by 3.3%, compared to a decline of 9.4% in standard, non-blind evaluations[387]. Differences between the gender composition of project coordinators (contact person) were also noted.

Ethics appraisal

Horizon Europe adopted a reformed approach to the **ethics appraisal process**. The objective of the simplification is to substantially reduce the workload for the great majority of applicants and beneficiaries, whose projects involve neither serious nor complex ethics questions, while upholding compliance with fundamental ethics principles in research and innovation, which is a prerequisite for achieving excellence[388].

The ethics appraisal process typically includes a self-assessment at the proposal stage by the applicants, followed by an ethics review procedure. There are then ethics checks, reviews and audits during implementation. Together these steps can generate a considerable workload[389] for the applicants and beneficiaries concerned, which is why they should only apply where the benefits of the process are likely to outweigh the burden. **The reformed ethics process therefore focuses the effort on projects involving serious or complex ethics issues**[390]. If any such issues are identified at an early screening stage, the proposal will be subject to a full ethics assessment. The assessment will then likely set out the ethics requirements for the project implementation phase. Monitoring data suggests that the measure has already had an effect[391].

[382] Depending on the cluster, between 50% and 60% of respondents reported 'under 10% extra effort' or 'no extra effort', with 30% to 40% indicating '10% - 50% extra effort', and 10% to 15% experiencing 'over 50% extra effort' or 'double the workload'. The survey question did not clarify the point of comparison ('extra' to what).
[383] Some of the responding call coordinators reported in 2024, spending 'roughly three times longer' on 'admissibility checks.
[384] The pilot did not collect quantitative evidence on the workload or timing of the public administration. Targets (time-to-inform, time-to-grant), as for all two-stages calls, remained applicable.
[385] The pilot did not assess whether the blind evaluation affected subsequent funding decisions.
[386] For legal reasons it was not possible to partially (incl. randomly) allocate the use of blind evaluations to applicants within the same call topic. The observed differences in characteristics, between blind and non-blind evaluations, may therefore not have been caused by the use of blind evaluations. See also Annex 4.4.3.
[387] Blind evaluation: from 21.2% to 20.5%; Non-blind evaluation from 19.1% to 17.3%.
[388] COM(2021) 407 final. Proposal for a Council Recommendation on a Pact for Research and Innovation in Europe.
[389] An estimate of the burden is not available due to lack of quantitative evidence.
[390] For a detailed description of the new elements involved, see Annex 4.4.4
[391] Attribution to the simplification measure cannot be demonstrated but is considered likely. No other changes to the programme could be identified that would have substantially altered the composition of proposals with respect to their relevance for the ethics assessment during the relevant period.

Of the projects that received Horizon Europe funding so far 90% and that underwent an ethics assessment[392](14 969), 90.6% **have been cleared without any further conditions or requirements linked to ethics,** compared with 44% under Horizon 2020. Conversely, 9.4% (1 406) have been given specific ethics conditions, while this applied to 55% of proposals under Horizon 2020. Under the assumption that the ethical complexity of the proposed projects has stayed constant between the programmes, the new approach has led to simplification for 46% of the submitted proposals.

Beneficiaries are generally satisfied with the new ethics self-assessment, with over 60% (419) reporting that their experience with it was positive 'at least to a moderate extent'[393]. Ethics and integrity were considered important topics by public consultation respondents[394].

The ethics process relies on institutional, local and national/regional mechanisms for oversight of research, in line with Article 19[395]. However, it is not possible to assess the quality of the ethics appraisals as they are not monitored. No increase of relevant incidents has come to the attention of the Commission.

4.2.4 Potential areas for further simplification

Qualitative evidence and feedback collected from stakeholders[396] suggests there has been no substantial change in the level of the administrative burden at project implementation stage between Horizon 2020 and Horizon Europe. The **project implementation phase** remains an area of focus for **simplification measures**, which reduce beneficiaries' costs without negatively affecting the projects' R&I impact. Horizon Europe beneficiaries responded to open questions in the targeted survey and provided **specific feedback or suggestions** on related topics. 40 specific suggestions were received, including on: single personnel rate for SMEs, timesheets, helpdesk for administrative procedures, MSCA PF manual, and the on-boarding of new grantees[397].

Lump sum funding

The main simplification potential targeting the administrative burden at project implementation stage is expected to come from lump sum funding. The use of lump sum grants is scheduled to broaden and pick up speed in the coming years, aiming to cover **half of the annual call budget by 2027**. In tandem, the simplification benefits from lump sum funding under Horizon Europe are expected to increase substantially. **The potential for future simplification from lump sum funding** in the remaining years of Horizon Europe is expected to **add between EUR 276 million and EUR 351 million** in reporting burden reduction[398].

Personnel unit costs

Since May 2024, '**Personnel unit costs'** have been introduced as an additional simplification measure available for Horizon Europe beneficiaries. This **new, optional method** enables

[392] Cut-off date for Dashboard data 6 January 2025. The ensuing calculations exclude project numbers without an ethics assessment, such as top-ups, Hop On Facility, framework partnership agreements, prizes, EIT KICs umbrella projects, and one Common Support Action. Additionally, the calculations exclude projects whose ethics review status is 'pending' (831). If these were to be taken into account, projects cleared without conditions would be 85.8% of the total signed and closed projects, projects conditionally cleared would be 8.9%, and the remaining 5.3% would be projects with pending outcome.
[393] Evaluation support study on Digital & Industrial, page 531. More details on responses in Annex 4.4.4.
[394] European Commission (2024). Synopsis Report, page 37, see also Annex 4.4.4.
[395] Regulation (EU) 2021/695.
[396] Public consultation, related event, position papers, qualitative evidence from the targeted survey, including responses to the open question.
[397] See Annex 4.3.4.
[398] Lump sum grants signed so far may not be representative of those expected to be signed under Horizon Europe overall. The estimate assumes a constant average ratio of lump sum benefits to grant value. The proportion of small grants will likely decrease, and the ratio will change. The total benefit is an order-of magnitude-figure estimate, which combines assumptions about future uptake and past experience and evidence.

participants to calculate and report personnel costs using a **single daily rate that applies to all staff** and that is agreed upfront for all of the beneficiary's future grants. Once projects are running, beneficiaries only report the total number of person-days worked during a reporting period. This **removes the burden on beneficiaries to calculate personnel costs per staff member**, which is estimated to typically take **about 2 person-days per consortium member and per reporting period**[399] in actual cost grants. For instance, an actual cost grant with 3 partners and 3 reporting periods is expected to benefit from savings of 18 person-days [400]. This suggests that the personnel unit cost method could tangibly reduce the reporting burden on beneficiaries. The interim evaluation has no evidence base to estimate the measure's expected voluntary uptake in the coming years, which would drive any estimation of the overall simplification effect. The **future monitoring of uptake and collection of feedback from beneficiaries is essential** to support an assessment of the measure and its potential in the final evaluation of Horizon Europe.

Application stage and proposal evaluation process

As reported in section 4.2.1, there has been no substantial change in the level of the application costs since Horizon 2020 and for many applicants the costs are not proportionate to their chances of securing Horizon Europe funding. The evaluation therefore confirms the finding of the Horizon 2020 final evaluation that any improvement with a potential to reduce the effort and cost required by applicants, in particular unsuccessful applicants, has a potential to increase the programme's efficiency.

Horizon Europe applicants responding to the survey's open question point out areas for improvement and make a number of concrete suggestions for simplification. For the **application stage** these centre on the topics: finding the right call, proposal templates, application guidance, internet interface/web portals, and the use of consultants. While qualitative evidence points at an **overall appreciation** of the evaluation process and of the quality of the evaluation, **evaluators and the evaluation process** were another focus of concerns (triggering 2007 comments alone). Topics included: quality of expert evaluators, level of detail of evaluation reports, scoring of resubmitted proposals, grant agreement platform, experiences with Seal of Excellence, and suggestions for the use of two-stage evaluations and partial randomisation (lottery) in proposal evaluation. [401]

While the survey's open questions can only collect anecdotal evidence, which is not representative, the contributions can provide first-hand insights into potentially highly relevant areas that should be included in any considerations on future simplification.

4.2.5 Monitoring and reporting

At the time of this evaluation, the Commission has not yet fully implemented the Horizon Europe Regulation. A single database – the Common Research Data Warehouse (CORDA)[402] – does exist and includes implementation data for all parts of the programme[403], covering both the proposal and project implementation (and reporting) stages. A curated version of CORDA can be accessed publicly through the interactive Horizon Dashboard[404]. Specific procedures are in

[399] Median value of 1307 targeted survey responses of actual cost grant beneficiaries with experience in reporting.
[400] Applying the labour cost in the EU's R&I sector this translates into a saving of EUR 4500 per such project.
[401] For details see Annex 4.3.4 and 4.3.5.
[402] CORDA is a part of the wider eGrants database, which includes implementation data for most direct management programmes implemented by the European Commission and its agencies.
[403] European Partnerships, Missions, ERC, EIC and EIT are singled out by the legal basis.
[404] Horizon Dashboard

place to ensure lawful access to a restricted population of users appointed by National Authorities.

Nonetheless, the central database remains incomplete in several aspects as described below.

1. Key Impact Pathway (KIP) indicators: during the first quarter of 2025, short-term indicators are to be made available publicly in a KIP Dashboard. Selected parts of the short-term KIP indicators are presented annually in the Programme Performance Statement[405]. Medium- and longer-term indicators are being operationalised, but their implementation is lagging due to CORDA data integration delays for some programme parts and the complexity of the indicator framework.
2. EIC Accelerator: at the time of this evaluation, approximately 3 900 proposals received in EIC Accelerator calls (both open and thematic) do not appear correctly in central monitoring systems. These are distinct between proposals that are not published in the Horizon Dashboard (due to missing data or inadequate disclosure rules)[406] and applications that are missing from central databases altogether. The CORDA database does also not include information on the resubmission of proposals. This means that if the same proposal is submitted multiple times, only its latest version is counted. If no corrective measures are taken, this unusual arrangement artificially inflates success rates and share of high-quality proposals for the Accelerator – and therefore for the entire programme. **For this reason, this evaluation does not publish any application figures for the EIC Accelerator.** Moreover, public monitoring tools do not currently include any implementation figures for the EIC Fund, which are only currently available to Member State representatives. Due to their different source and their data taxonomy not fully aligned with other Horizon Europe projects, EIC Fund statistics are always shown separately in this document.
3. European Partnerships: for several types of partnerships partial or full implementation figures are not yet available. Call activities for EIT KICs, Article 185 TFEU initiatives, and co-funded partnerships are fully or partly managed outside Commission grant management tools. As a result, their integration in the central systems takes place periodically and is incomplete to date. In addition, there is no system in dashboards for distinguishing 'cascading grants' (from the partnership to its beneficiaries) from the 'first-level' grants from the Commission to the bodies implementing the partnership[407].

The CORDA database includes information enabling the analysis of most of the areas listed in the monitoring provision of the Horizon Europe Regulation[408]. There are still a few aspects where integration of data into CORDA has not been implemented, which prevents public access through

[405] Horizon Europe - Performance

[406] These are specifically proposals that have been rejected, but that are still eligible for resubmission. In the EIC Accelerator, uniquely in the programme, resubmitted proposals receive the same unique identifier as the first submission. These proposals are not published in dashboards as they are not considered fully evaluated, even if they effectively went through at least one full evaluation. This same feature also means that success rates can be counted either by the number of distinct resubmissions or by the number of distinct proposal numbers. The second ratio, which is used for the rest of the programme, will always be the highest. For details on the proposal submission system of the EIC Accelerator and associated methodological issues, see p. 14 on the Commission monitoring report '*SME participation in Horizon Europe'*, 2024. https://data.europa.eu/doi/10.2777/576670.

[407] While the issues described do not apply to JUs and co-programmed partnerships – which are all managed through Commission corporate tools – the visibility of partnership data is limited as there is no simple method (e.g. a single filter or a dedicated field in the dashboards) to identify all proposals and grants that are under European partnerships.

[408] The full list in Article 50 point (b) includes: SSH, the ratio between lower and higher TRLs, participation of widening countries, geographical composition of consortia, researchers' salaries, use of the two-stage procedure, the measures aimed at facilitating collaborative links, the use of the evaluation review and the number and types of complaints, climate mainstreaming expenditure, SME participation, private sector participation, gender participation, the Seals of Excellence, European partnerships and funding from other EU programmes, research infrastructures, time-to-grant, international cooperation, engagement of citizens and civil society.

the dashboard: (i) 'Seals of Excellence', for which the full figures for the EIC Accelerator are not yet in the central database; (ii) trends in researchers' salaries[409]; (iii) (gender) participation in boards and advisory groups; and (iv) complementary and cumulative funding from other EU programmes.

The Commission's services responsible for data management have been working on finalising data integration in the central monitoring system, for instance by creating templates for reporting of implementation data and project outputs in 'cascading grants'. The complexity of the task, particularly when it needs coordination with delegated bodies, has significantly slowed down progress. This evaluation however has not found any provisions in the legal basis that have proved technically impossible to implement.

The time lags are another limitation affecting the relevance and interpretability of figures released by the Commission. Call results are not made public when they become available. The Commission only publishes results for calls that have been fully evaluated and that comply with a set of disclosure rules. The list of calls that are not yet included in the database is not made public, although their results may already be available through different sources (e.g. press releases from implementing bodies).

On IPR, business factors also come into play, e.g. companies choosing secrecy over IPR to protect their innovations. Moreover, it is estimated that over half of patent applications reported by Horizon beneficiaries are confidential (cfr. Section 4.1.3), thus lacking the metadata needed to count them as part of the Key Impact Pathway reporting system.

4.3 Coherence

4.3.1. Internal coherence

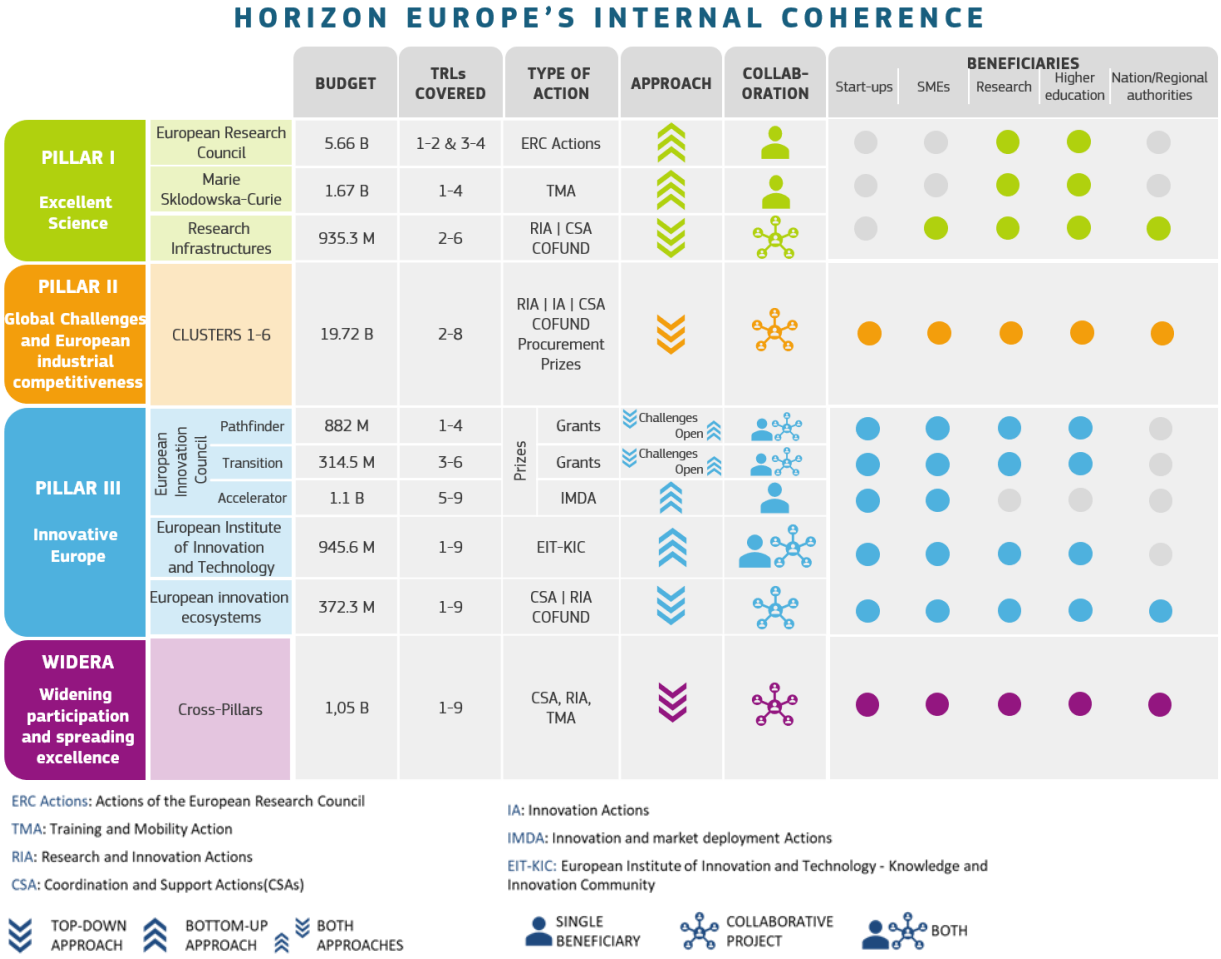
The interim and *ex post* evaluations of Horizon 2020 judged the number of instruments excessive, making 'the landscape for EU R&I support difficult to navigate and potentially leading to less coherent interventions'[410]. In Horizon Europe, several changes were made to respond to this: (i) the pillar structure was redesigned[411]; (ii) the partnership landscape was rationalised; and (iii) the portfolio approach was introduced to the EU Missions and the EIC. These changes led to the programme structure outlined in Figure 13.

[409] A joint OECD-Commission survey, part of the ReICO initiative, will fill this gap from 2026 onwards. More information: https://ec.europa.eu/era-talent-platform/reico/

[410] SWD (2024)29 final, p. 74. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2024:29:FIN

[411] SWD(2018)307final - 1/3, p. 21. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018SC0307 Horizon Europe includes an innovation-focused pillar to support breakthrough market-creating innovations and integrates key enabling technologies. The redesigned pillar structure was set to improve coherence by integrating industrial technologies in Pillar II, rationalising societal challenges into five cross-theme clusters that cover the whole innovation chain and encourage transdisciplinary activities, including SSH; streamlining different innovation support instruments through the EIC; linking the EIC to the ERC, MSCA and the EIT KICs.

Figure 13: Overview of Horizon Europe types of action and their characteristics



Source: Horizon Europe external evaluation studies. Budget data from Horizon Europe Dashboard 7 June 2024

However, the targeted survey showed that participants are not fully aware of opportunities for exploring the links and between the different programme's parts and discovering how they complement each other. Over 70% of the 5 970 beneficiaries who responded indicated that they either do not plan any joint activities or are unable to answer. The lowest number of collaborations are planned with Pillar III (less than 1% of respondents).

The external evaluation studies found a number of factors described below that are hindering internal coherence.

- Challenges hindering internal coherence in a number of clusters include the fragmentation of information, the complexity of putting cross-pillar bridges into practice and the identification of key results[412].
  - For instance, the use of emerging technologies, such as AI tools, in the research process of Horizon-funded projects has been increasing as 12-17% of Horizon Europe projects use or develop AI across all clusters and pillars (including with funding from bottom-up instruments, such as the ERC or with start-up support from the EIC)[413].
  - A gap in portfolio management was also identified: for instance, potentially relevant MSCA networks or EIC projects are not considered systematically by project officers

[412] Digital and Industrial Transition study, 2024, Executive summary. https://data.europa.eu/doi/10.2777/300334
[413] Digital and Industrial Transition study, 2024, case study 12. https://data.europa.eu/doi/10.2777/489648

in executive agencies when organising thematic workshops for their project portfolios[414].

- Joint activities between Missions and European Partnerships are rare[415]. A good example is the joint call between the Cities Mission and the Towards Zero-Emission Road Transport (2Zero) partnerships and the Connected, Cooperative and Automated Mobility (CCAM) partnership in 2023. Similarly, the Innovative Health Initiative (IHI) JU has topics directly contributing to the Cancer Mission, while Europe's Rail JU has a pilot project supporting the Mission for Climate-Neutral and Smart Cities, focusing on a new railway station concept [416]. In spite of these examples, the Missions' reliance on the same types of projects (e.g. RIA, IA, CSA) as other parts of Horizon Europe limits their distinctiveness.

- Under Pillar III, there is overlap between some of the instruments in terms of the type of support provided, the TRL levels covered, and the groups targeted[417]. This overlap is mitigated by the instruments' specific characteristics (see Figure 14), but only to a certain extent.
- There is an overlap between the EIT and the EIE which both lay the groundwork for a pan-European innovation ecosystem connecting regional innovation ecosystems across the EU. The EIT brings together higher education institutions, research organisations and businesses (the knowledge triangle) around specific sectors, and the EIE involves a broader group of stakeholders across the quadruple helix[418]. However, a lack of distinctive features between the two instruments has been highlighted[419].
- Stakeholders from academia raised concerns about the design and implementation of the WIDERA programme. They highlighted the complexity of the work programmes, which address both the widening and strengthening components for ERA[420].

Nevertheless, as one of the more recent instruments, the EIC is taking measures to connect to other parts of the programme.

- Following the introduction of the EIC Transition scheme in Horizon Europe, there is now funding that targets innovation activities that go beyond the experimental proof of principle in a laboratory. This helps mature and validate novel technologies from the lab to the application environments, which initially included beneficiaries of ERC PoC support. In 2024, eligibility was further extended to include **former recipients of Horizon Europe and Horizon 2020 funding for collaborative projects.**
- ERC PoC project beneficiaries are among those who can draw on this new funding stream. **Nearly half the EIC Transition grants have been awarded to beneficiaries of PoCs**.

[414] Green Transition evaluation study, 2024, Chapter 3.4.1.2. https://data.europa.eu/doi/10.2777/67934.
[415] Ibid, Chapter 3.5.2.
[416] New railway station concept for green and socially inclusive smart cities. EU Funding & Tenders Portal
[417] Innovative Europe evaluation study, 2024, Chapters 7.1 and 9.4. https://data.europa.eu/doi/10.2777/499132.
[418] The "quadruple helix" model in the context of innovation refers to a framework that emphasises the collaboration and multi-directional interactions among the government, industry, academia, and civil society.
[419] See the EIE and EIT beneficiaries in the Figure 14 - Overview of Horizon Europe types of action. They both facilitate interaction among innovation players and cultivate a conducive environment for innovation to thrive. They also both have a regional dimension: the EIT has a solid geographic coverage through the EIT KICs co-location centres or regional hubs, and the EIE focuses on building European, national, regional, and local networks across the EU and associated countries, particularly through Regional Innovation Valleys. As part of the EIE, the Commission launched several calls for proposals with an interregional dimension - closely linked to the EIT Regional Innovation Scheme that develops innovation ecosystems in low-innovation performance regions and links them to local and regional smart specialisation strategies. Innovative Europe evaluation study, 2024, p. 81.
[420] Excellent Science evaluation study, 2024, Section 1.6.2.2 . https://data.europa.eu/doi/10.2777/2295765

- From 2024, EIC Transition grants are also **open to former recipients of Horizon Europe and Horizon 2020 funding for collaborative projects**[421].
- There is also a **Fast Track approach for EIT companies** into the Accelerator that skips the first stage of the evaluation, but only five companies have benefited from this approach so far. Out of all 550 EIC Accelerator beneficiaries (not only those arriving via the fast track), as of May 2024, 140 companies supported by EIT KICs went on to win EIC funding.
- A similar **fast track was launched in 2023 for beneficiaries of national programmes**, and there have been 13 beneficiaries to date.

ERC Proof of Concept, EIC Transition and MSCA beneficiary wins the 2023 Nobel Prize in physics

Prof. Anne L'Huillier from Lund University is a former MSCA and ERC beneficiary. Dr L'Huillier supervised numerous MSCA postdoctoral researchers and coordinated several MSCA projects over the past two decades in the field of attosecond science and was the coordinator of an ERC Proof of Concept (PoC) project afterwards. This PoC grant has made the project eligible to apply for an EIC Transition scheme and her team was awarded the grant for the project called 'Single-shot, ultrashort laser pulse characterisation based on the dispersion scan technique' (101058075).

Prof. L'Huillier won the 2023 Nobel Prize in physics for 'for experimental methods that generate attosecond pulses of light for the study of electron dynamics in matter'[422].

While the general scope of the memorandum of understanding (MoU) on EIC-EIT cooperation remains relevant, progress has been uneven[423]. Cooperation between the EIC and the EIT KICs is still challenging because of their separate and different structural and governing models, the absence of a complete common strategy and stability, limitation in terms of human resources, and challenges in practically implementing the Fast Track scheme.

Technology readiness levels (TRLs)

Technology readiness levels (TRLs) are at times used to check the framework programme's internal coherence. In Horizon 2020, there were no legal requirements for TRL coverage, but it was the first framework programme to introduce a reference to the TRL classification in its calls. The Horizon Europe regulation lays down that the collaborative parts of the programme as a whole should ensure a **balance between lower and higher TRLs**[424], that Missions[425] and that Pillar II should cover activities from a broad range of TRLs, also including lower TRLs[426].

The external evaluations collected different views described below:

- On the positive side, interviewees reported that the TRL concept helps applicants focus on technology progression for calls within Pillar II (Cluster 1)[427].
- Cluster 3 interviewees highlighted that setting high TRLs as a target for calls strengthened stakeholder engagement as it requires user involvement in testing and demonstration activities that take place in a relevant or operational environment[428].
- On the negative side, Cluster 4 interviewees reported that the programme's potential is hindered by a gap in financing collaborative research at lower TRL levels. It is also difficult

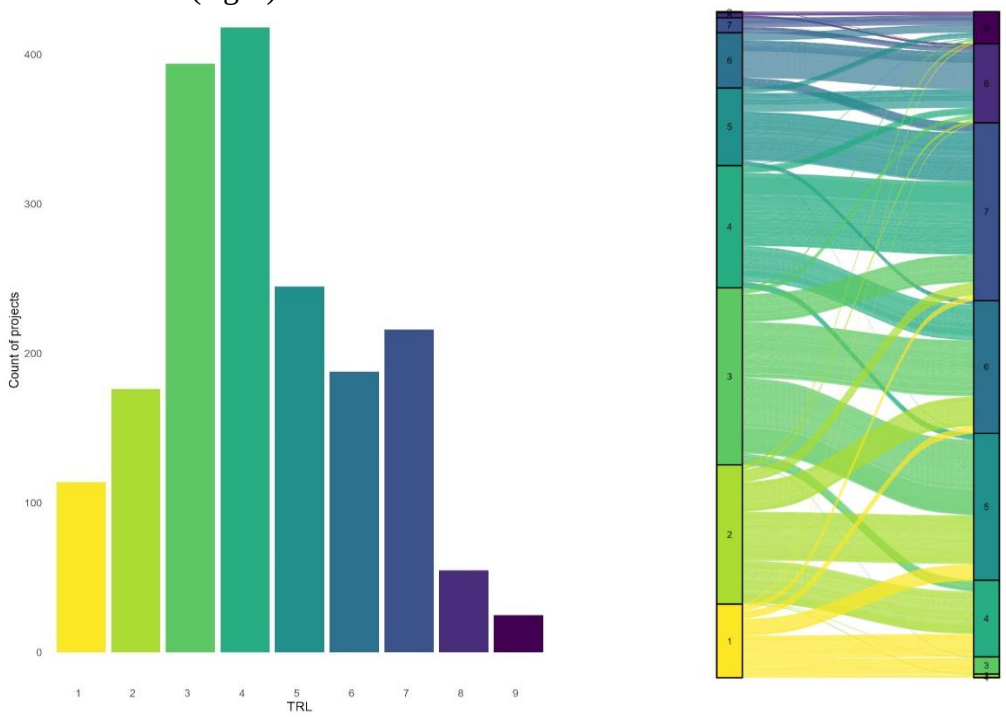
[421] EIC work programme 2024. https://eic.ec.europa.eu/eic-2024-work-programme_en. Previously, the grants were only open to previous recipients of ERC Proof of Concept, EIC Pathfinder and European Defence Fund. In addition, the EIC work programme 2025 opens eligibility of Transition to projects from JUs.
[422] Innovative Europe evaluation study, 2024, p. 76. https://data.europa.eu/doi/10.2777/499132.
[423] Innovative Europe evaluation study, 2024, Chapter 7.1. https://data.europa.eu/doi/10.2777/499132.
[424] Article 7 (3) of Regulation (EU) 2021/695 establishing Horizon Europe. In addition, Article 50 (1) states that monitoring and reporting should also encompass the ratio between lower and higher TRLs in collaborative research.
[425] Article 8 of Regulation (EU) 2021/695 establishing Horizon Europe. https://eur-lex.europa.eu/eli/reg/2021/695/oj
[426] Ibid., Annex I.
[427] Resilient Europe evaluation study, 2024, Section 5.2. https://data.europa.eu/doi/10.2777/797281.
[428] Ibid, section 4.1.

to ensure continuity between RIAs and IAs (around TRL 4-5). The interviewees noted the slow maturation of RIA results towards deployment, a fragmentation in research approaches and a lack of coordination between projects. This continuity is particularly important in fast-evolving areas (e.g. AI, data and robotics, advanced computing).[429]

- In Clusters 5 and 6, interviewees warned that the shift to higher TRL funding discouraged universities from participating[430].
- The focus on innovation in European Partnerships may be associated with research gaps for lower TRLs. This can lead to a weakened scientific and technological base in the medium term as many solutions for climate neutrality have not been developed yet[431].

In Horizon Europe, some beneficiaries have reported for the first time on the TRL of their *projects*: by the time this analysis was conducted, TRL information was available for 1 807 projects (12% of all projects)[432]. Figure 15 shows the current TRL of projects as reported by beneficiaries, as well as the levels at the beginning and planned (or already achieved) end-TRLs. Out of the 1807 projects for which TRL at project start and project end is consistently available, nearly half (48%) record an increase of at least three levels (actual or expected), and 88% reported an increase of at least two levels. For TRL data by pillar, see figures 120-123 in Annex 8.

Figure 14: Current TRL of Horizon Europe projects (left), as well as the levels at the project beginning and expected/achieved at the end, taking into consideration the size of EU contributions (right)



Source: DG RTD elaboration based on Dashboard, 6 January 2025 and Corda, 20 January 2025.

More than half of Horizon Europe project beneficiaries (66%) who responded to the evaluation survey perceived the TRL scale as an adequate measure for capturing market maturity.

[429] Digital & Industrial Transition, 2024, executive summary p. 10, p. 90. https://data.europa.eu/doi/10.2777/300334
[430] Green Transition evaluation study, 2024, section 14.2.5. https://data.europa.eu/doi/10.2777/67934.
[431] Ibid., section 13.4.1.1.
[432] This includes projects that reported TRL at the start of the project and the expected or achieved TRL at project end. TRL data is sourced from Periodic Reporting: this means that only projects that have been running for around 12-18 months can have valid TRL data. The time of publication of Periodic Reporting varies project by project. Additionally, TRL information is supplied on a voluntary basis so not all projects report TRL data consistently.

Respondents who did not agree with that statement[433] specifically mentioned the fields of pure mathematics and fundamental research projects, as well as SSH-related projects and those focusing on policy-making and social innovation. This sceptical view was also supported by stakeholders participating in the public event for the interim evaluation of Horizon Europe, which was held in June 2023.

New programme governance

Horizon Europe introduced a new approach to programming through co-creation and co-design, involving relevant Directorate-Generals (DGs), Member States and stakeholders in strategic planning and topic drafting, focusing on outcomes to be achieved. The external evaluation studies report that this approach has improved the programme's coherence. Topics drafted with strong outcome statements for cluster 6 are considered easier to understand and selected projects under these topics engage a higher share of users (the stakeholders mentioned in the topic).[434]

To support the complex societal transition processes, the design of the work programme is now done in a more collaborative way. It involves all Commission departments with an interest in the Cluster/Destination on a level playing field, with a common budget envelope, and a steering board composed of Directors General and a Directors' Group for each programme part. Previously, topics were independently managed by a single DG, sometimes in isolation[435].

Horizon Europe was designed to create synergies across EU funding programmes[436]. However, as seen in the assessment of internal coherence above, the full potential of synergies anticipated by the legislators has not been achieved so far.

The 2024 report on 'The future of European competitiveness' found that determination processes for priorities and budget allocation are overly complex[437]. The programme involves a wide range of Commission departments, Member States and the European Parliament through complex governance arrangements. One of the objectives of the strategic plan was to promote consistency between the work programmes, EU priorities and national priorities, as there is no formal mechanism that aligns EU and national R&I spending priorities, given that R&I are a national competence and thus not subject to EU-level decision-making.

What messages emerged from the stakeholder consultation?

Among all respondents, 76% (1 200) found that the introduction of the **co-creation process** with the relevant Commission departments **contributed either somewhat or to a great extent to strengthening the impact of European research and innovation**. In particular, NGOs (42%; 28), companies (39%; 106) and citizens (38%; 86) believed that it helped to a great extent. At the same time, public authorities were less convinced: only 33% (28) indicated that it helped to a great extent.

4.3.2. External coherence and synergies

Synergies between Horizon Europe and other EU programmes

In Horizon Europe, the strategic planning and work programming processes – co-created with other EU programmes and policies and Commission departments – identify and target initiatives for integrating EU funding for research and innovation into other instruments and programmes.

[433] 4%; 225 (N= 5 305)
[434] The data refer to Cluster 6 in comparison to other clusters and H2020 Green Transition evaluation study, 2024, chapter 12.1.1. https://data.europa.eu/doi/10.2777/67934.
[435] Green Transition evaluation study, 2024, Chapter 12.1.1. https://data.europa.eu/doi/10.2777/67934.
[436] Primarily those listed in annex IV of its regulation.
[437] Draghi, M., "The future of European competitiveness – In-depth analysis and recommendations", 2024, p. 237.

The Horizon Europe Regulation describes **desirable synergies with 20 EU programmes[438] - up from 13 that were assessed in Horizon 2020's *ex post* evaluation**. The Commission also adopted a guidance notice on new opportunities to maximise the synergies between Horizon Europe and the European Regional Development Fund (ERDF)[439]. The evaluation treats these documents as objectives/targets in the field of synergies and assesses progress in their implementation (with details in Annex 6).

External evaluation support studies[440] found evidence of synergies with 18 programmes out of the 20 identified in the regulation – to a varying extent. Based on interviews, financial data and text analysis [441] , **the strongest synergies were identified with the LIFE programme, Erasmus+ and the Digital Europe programme, while the weakest evidence concerns synergies with the Common Agricultural Policy (with the exception of Cluster 6), the Creative Europe programme and InvestEU.** The evaluation did not find evidence of synergies with the Instrument for Pre-Accession Assistance or the Just Transition Mechanism.

Despite Commission efforts to create synergies (described in Annex 6), 64% of beneficiaries surveyed reported that they had not sought additional funding for their research projects[442]. Excluding the 10% of respondents who were unable to answer this question[443], where additional funding *was* sought (1 623 respondents or 26%) - it was primarily under national or regional funding schemes. Among unsuccessful applicants, 29% of survey respondents (2 587) applied for alternative sources of funding. Over half of the beneficiaries also stated that the project they were working on was not a continuation of previous or other funding schemes (reaching as high as 60% of respondents in Pillars I and III[444]).

There is more information available on the Commission departments' *mechanisms* for creating synergies than data on the *results* of synergies, such as the deployment of specific Horizon Europe outputs through other EU programmes (which is an expected synergy for 11 of the 20 programmes listed in the regulation)[445]. The availability of data also varies depending on the programme's management mode (directly managed by the Commission or Executive Agencies, in shared management with Member States or indirect management by financial institutions). However, regardless of the management mode, there is no systematic, continuous monitoring of synergies.

Seal of Excellence as an instrument of synergy

The Seal of Excellence (SoE) quality label was awarded to 7 166 high quality proposals that could not be funded due to budget limitations between 2021 and 2024. The largest proportion

[438] In Annex IV of Regulation (EU) 2021/695. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32021R0695&from=EN#d1e32-60-1.
[439] C(2022) 4747 final. https://research-and-innovation.ec.europa.eu/system/files/2022-07/c_2022_4747_1_en_annex.pdf.
[440] On Excellent Science: https://data.europa.eu/doi/10.2777/2295765, Resilient Europe: https://data.europa.eu/doi/10.2777/797281, Digital & Industrial Transition: https://data.europa.eu/doi/10.2777/845650, Green Transition: https://data.europa.eu/doi/10.2777/67934, Innovative Europe: https://data.europa.eu/doi/10.2777/499132, all published in 2024.
[441] Catalano G., Consiglio, G. and Delponte L. *Horizon Europe Internal and External Coherence (Synergies): Supporting the Interim Evaluation of Horizon Europe.* Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2777/5616419
[442] 4 045 out of 6 280 respondents.
[443] 612 out of 6 280 respondents.
[444] Survey of beneficiaries, May-July 2023. Respondents: Pillar I: 1859, Pillar II: 3725, Pillar III: 383, WIDERA; 313.
[445] DEP, CEF, LIFE, ISF, JTM, RFF, CAP (and the EAFRD), EMFAF, EU4Health, ERDF and ESF+ (Annex IV to Horizon Europe Regulation).

was awarded to researchers who applied under the Marie Skłodowska-Curie Actions, followed by the EIC Accelerator and the ERC Proof of Concept scheme.

Table 7: Seals of Excellence awarded

Programme part	Number of proposals/researchers awarded with SoE	
	2021-2024	2018-2020
Marie Skłodowska-Curie Actions: - MSCA COFUND - MSCA Postdoctoral Fellowships	MSCA total: 5 342 60 5 282	7 434
European Innovation Council - EIC Accelerator - EIC Transition	1 304 1 237[*] 67	EIC Accelerator Pilot: 3 827 ~11000 if the SME instrument (phases I and II) is included
ERC Proof of Concept	476	80
WIDERA Teaming for excellence	26	3
Mission on Adaptation to Climate Change	18	n/a
Total Seals of Excellence awarded	**7 166**	**20 890**

Source: Commission monitoring systems, 6 January 2025. For EIC Accelerator: EISMEA internal monitoring, 15 January 2025. For EIC Transition, DG RTD monitoring, 25 September 2024. MSCA data for 2018-2020 provided by DG EAC. The table may not include SoEs issued within calls launched in 2024 that were not available in the monitoring resource at the reference date.

These statistics evolve due to the changes between Horizon 2020 and Horizon Europe. For instance, the number of entities that reach the final selection stage in the EIC Accelerator is lower than under its predecessor, the SME instrument phase 2, which also results in fewer Seals of Excellence being issued in Horizon Europe.

Almost all SoEs are issued in mono-beneficiary schemes. As an exception, the Mission on Adaptation to Climate Change awarded a Seal of Excellence for collaborative projects that met the selection criteria but could not be funded. However, this pilot was cancelled: the multi-beneficiary nature of these projects has made it difficult to ensure uptake at national level.

Around half of unsuccessful applicants who responded to the evaluation survey (45% of the 129 respondents) reported that the Seal of Excellence did not make it easier to secure alternative funding. Another 20% did not know or the question was not applicable. In open question responses, applicants specifically mentioned a lack of follow-up funding opportunities in their respective Member States that recognise their SoE.

While there is no legal obligation for Member States and beneficiaries to report back on the use of the SoE, some evidence has been collected through the Seal of Excellence Community of Practice, a forum that includes national and regional authorities. According to the voluntary reporting of its members, since the start of the initiative more than 40 national and/or regional Seal support schemes, including ERDF programmes, have been set up in most Member States.

Member States have seized the opportunity of creating synergies between Horizon Europe and the Recovery and Resilience Facility (RRF) by supporting SoE projects. Some examples are listed below.

- Spain allocated EUR 50 million in its recovery and resilience plan (RRP) to 33 innovative companies with SoE from the 2021 and 2022 EIC Accelerator calls. Similarly, Greece allocated EUR 18 million in its RRP to start-ups and SMEs. Bulgaria, Czechia and Slovakia are currently providing similar support.
- In Italy, the Ministry of Research launched an initiative to support approximately 400 researchers under its RRP.

[*] The count does not include 3 proposals that received a Seal of Excellence were subsequently funded by the EIC Accelerator using resources from the European Regional Development Fund assigned to Lithuania, the host country of the applicant companies.

- In Slovenia, a new initiative funded by the RRF provides financial support to Slovenian researchers who, since 2019, have been awarded the MSCA SoE when they applied with a host organisation abroad under MSCA IF and MSCA PF calls[446].

EU Missions and European Partnerships as instruments of synergy

In terms of the EU Missions' *objectives and design*, previous assessments found synergies with other EU programmes. In the digital technologies field, several EU Missions share common objectives with the **ERDF and Digital Europe programme**[447,448,449,450]. Four out of five Missions' goals are also aligned with the priorities of the **LIFE programme**[451]. In the **Europe's Beating Cancer Plan,** the Cancer Mission is a major component of EU's investment in cancer[452]. This enables close synergies with the EU4Health Programme[453].

While there is no systematic reporting on synergies, the Policy Support Facility (PSF)[454] identified the following progress.

- In the Climate Adaptation Mission, around 80 LIFE and InterReg[455] projects have been identified as relevant for climate resilience, with over 20 actively participating in the Mission's Community of Practice[456], sharing adaptation best practices[457].
- The Ocean and Waters Mission 'is acting as a catalyst for synergies and complementarities across different EU, national and regional programmes, already pooling funds beyond R&I, namely EMFAF12 national plans, BlueInvest with at least EUR 1 billion in risk finance[458], Recovery and Resilience Funds, Interreg and Copernicus'[459].
- The Cities Mission mobilised support from the EIB (which participates in the review process of Climate City Contracts, provides advisory services to Mission cities and has set aside a lending envelope of EUR 2 billion to cities that received the Cities Mission Label).
- All CEF calls that launched in September 2022 for projects on the TEN-T network (for a total of EUR 5 billion) include participation in the Cities Mission as an award criterion under 'priority and urgency'.
- References to the Cities Mission and the Climate Adaptation Mission were included in call topics 'greener cities' (overall budget EUR 120 million) and 'energy transition' (overall budget EUR 90 million) under the Urban Innovative Action initiative managed by DG REGIO.

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[446] Excellent Science evaluation study, 2024, p. 53. https://data.europa.eu/doi/10.2777/2295765
[447] Guidance on synergies with the ERDF, annex to Communication to the Commission C(2022) 4747 final, p. 42.
[448] Ibid., pp. 44-45. Study supporting the assessment of EU missions and the review of mission areas: Mission Climate-neutral and smart cities assessment report, pp. 40-41, 2023. https://data.europa.eu/doi/10.2777/35567
[449] SWD(2023) 260 final, p. 31 and 55. https://op.europa.eu/s/zE5j
[450] Ibid., p.58.
[451] Such as Nature and Biodiversity (Soil and Ocean Missions), Circular Economy and Quality of Life (Cancer and Cities Missions), Climate Change Mitigation and Adaptation (Adaptation to Climate Change Mission), and Clean Energy Transition (Cities Mission). Commission Staff Working Document SWD(2023) 260 final, p. 27 and 29 – Adaptation to Climate Change, p. 84 – Ocean, p. 113, 130 – Soil).
[452] Europe's Beating Cancer Plan – Communication from the Commission to the European Parliament and the Council, 2022, p. 6. https://health.ec.europa.eu/system/files/2022-02/eu_cancer-plan_en_0.pdf
[453] EU4Health programme 2021-2027 – a vision for a healthier European Union, available here
[454] Penna, C., Mission-oriented funding and instrument synergies – Mutual learning exercise on EU missions – Third thematic report, Publications Office of the EU, 2024, pp. 20-21. https://data.europa.eu/doi/10.2777/647815
[455] Climate adaptation mission portfolio Public - Projects | Sheet - Qlik Sense (europa.eu)
[456] https://futurium.ec.europa.eu/en/eu-mission-adaptation-community
[457] Adaptation Stories (europa.eu)
[458] Including the launch of 'EU Blue Champions' scheme to support innovative projects. https://maritime-forum.ec.europa.eu/news/launch-eu-blue-champions-scheme-support-innovative-projects-2023-12-21_en#:~:text=A%20new%20pilot%20scheme%2C%20%27EU%20Blue%20Champions%27%2C%20is,advisory%20to%20selected%20projects%20in%20the%20blue%20economy.
[459] Communication "EU Missions two years on – assessment of progress and way forward", 2023, p. 5.

- 18 Member States have integrated the Soil Mission by into their Common Agricultural Policy strategic plans, which allows for the replication of solutions in more than 1 000 testing sites, and the Mission is also being taken up by regional and local authorities.

Together with Europe's Beating Cancer Plan, the Cancer Mission has set up a new dialogue with Member States on the disease. This dialogue brings together health and research ministries in the joint cancer subgroup, ensuring that scientific knowledge gained through R&I informs policy development. This integrated approach is being replicated at national level, by the ECHoS project, supporting the creation of 'National Cancer Mission Hubs' in Member States.

European Partnerships reported in the BMR survey that their **synergies mostly consist of strategic exchanges, communication and dissemination of results and networking with project partners in the same area of research or a similar one**. Only one third of BMR partnership respondents indicated joint calls for research and/or innovation proposals (together with other partnerships)[460]. Nevertheless, five partnerships reported that the share of budget covered by regional and national funds is above 50%: Risk assessment of chemicals – 50%, Global health EDCTP3 – 59%, Metrology – 56%, and Biodiversa – 79.4%.

Several JUs are co-funded by other EU programmes:

- the EuroHPC JU receives most of its funding from the Digital Europe programme and the Connecting Europe Facility – a commitment of EUR 2.2 billion for 2021-2027 (with Horizon Europe contributing EUR 900 million)[461];
- the Clean Hydrogen JU is co-funded by REPowerEU (for the Clean Hydrogen Valleys)[462];
- the Chips JU is co-funded by the Digital Europe Programme with EUR 1.45 billion (against a Horizon Europe contribution of EUR 2.725 billion)[463];
- in the 2024 Biennial Monitoring Report on Partnerships, at least four Member States reported to have financially supported their participation in co-funded partnerships through the use of ESIF and ERDF funds[464], and the Recovery and Resilience Fund[465].

Among the co-programmed partnerships, only 'Clean Steel - Low Carbon Steelmaking' has received a commitment of funding from other EU funds – in this case from the Research Fund for Coal and Steel (RFCS) for an amount of EUR 350 million (matching the contribution from Horizon Europe)[466]. The contribution from the RFCS to the Clean Steel Partnership is in the form of a dedicated high-TRL call (the Big Tickets call) for large pilot and demonstration projects. This call has encountered problems on the budget-expenditure side. Between 2021 and 2024, only 31% of the planned EUR 208 million budget was spent.

The EIT KICs have been acting as implementors in other parts of Horizon Europe, conducting R&I activities which facilitate cross-policy, cross-sectoral and international cooperation. Their participation is shown in the following examples:

[460] European Commission, Biennial Monitoring Report (BMR), 2024, p. 37
[461] Article 5 of the EuroHPC Regulation. https://eurohpc-ju.europa.eu/system/files/2022-03/uriserv_OJ.L_.2021.256.01.0003.01.ENG_EN_TXT.pdf.
[462] RePowerEU Plan, COM/2022/230 final, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483.
[463] Council Regulation (EU) 2023/1782 amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking, Article 9. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R1782
[464] BMR 2024, p. 77.
[465] BMR 2024, p. 196. The case of Italy is specifically mentioned.
[466] MoU for the Clean Steel partnership. https://research-and-innovation.ec.europa.eu/system/files/2022-01/c_2021_4113_f1_annex_en_v4_p1_1213800.pdf

- In the *Preparatory action for setting up joint programmes among innovation ecosystems actors* and *Stimulating Experimentation Practices* calls[467], the EIT KICs were listed as the target groups.
- Involvement of the EIT KICs in the EIE CONNECT calls: EIT KIC Health is in the project on *Growing Connection for Bio Ecosystems* (COBIOE) and *Inclusive and Interconnected Ecosystem to Boost Paediatric Innovation in Europe* (i4KIDS-EUROPE). In the project *Mediterranean Island Cleantech Innovation Ecosystem* (MICIE), the EIT Climate-KIC is one of the partners[468].
- The EIT Climate-KIC leads the flagship project consortium under the EU Mission for Adaptation to Climate Change, Pathways2Reslience, and also leads the NetZeroCities consortium running the Cities Mission platform (with an EU contribution of EUR 96.3 million, according to CORDA data in July 2024).
- The EIT KICs are supporting the implementation of the Mission Soil living labs: EIT Climate-KIC and EIT Food are part of the consortium supporting the Mission Soil living lab implementation[469]. EIT Food is also coordinating five living labs on carbon farming[470].

The evaluation also found the following evidence of the partnerships' coherence with national initiatives.

- The **State Representatives Groups (SRGs)** serve as advisory bodies, ensuring alignment at all programming levels, from Strategic research and innovation agenda to annual work programmes, and national policies and priorities[471]. This was also highlighted as a positive factor in the external evaluation of several JUs (the Circular Bio-based Europe JU, SESAR3, Europe's Rail JU) as well as co-programmed partnerships (Built4People, 2ZERO, CCAM).
- In Hungary, the **EIT Digital Hungary branch received local government support** of EUR 60 000 to support running the Hungarian hub. In Estonia, TalTech University agreed to support Tallinn satellite operation and contributed EUR 90 000 in 2022[472].

4.4 EU added value

4.4.1. Economic added value: Horizon Europe leveraged additional resources for R&I

As of 6 January 2025, project participants had invested a total of EUR 10.2 billion of their own resources in Horizon Europe projects. This is equivalent to a leverage factor of 0.236: in other words, each euro the EU invests in Horizon Europe R&I projects directly attracts additional R&I investments of about EUR 0.24. To date, the Horizon Europe's programme-wide leverage factor has not changed compared to the factor in Horizon 2020 projects (also 0.236).

With each euro of EU contribution, Horizon Europe leveraged around EUR 0.5 in co-investment from private for-profit bodies, which is about the same as in Horizon 2020. For SMEs specifically, the leverage factor is 0.36 (up from 0.33 at the end of Horizon 2020). For comparison, co-investment from higher education institutions is EUR 0.03 per euro invested by the EU.

An additional source of EU funding leverage not included in above statistics, is the **EIC Fund**, the equity instrument of the EIC Accelerator. This instrument is aimed specifically at SMEs (and

[467] HORIZON-EIE-2023-CONNECT-01-02 and HORIZON-EIE-2023-CONNECT-02-01.
[468] First two bullets from the Innovative Europe study, 2024, section on 7.1 on int. coherence, p. 85, https://data.europa.eu/doi/10.2777/499132. Details in Table 1, Case study 6. https://data.europa.eu/doi/10.2777/354.
[469] https://cordis.europa.eu/project/id/101145592
[470] https://cordis.europa.eu/project/id/101157414
[471] Green transition evaluation study, Appendix J, p. 923. https://data.europa.eu/doi/10.2777/489648
[472] Partnership Evaluation report, Section 4.2. https://data.europa.eu/doi/10.2777/431739

small mid-caps). For the Horizon Europe period only, as of 2 December 2024, the EIC Fund had disbursed approximately EUR 570 million: the sum includes EUR 471 million in equity investment over 104 funding rounds, as well as 38 convertible loans (EUR 97 million).

One of the goals of the EIC Fund is to match each of its investments by at least an equivalent amount of capital from other partners, such as private venture capital investors or public investment funds. As of 2 December 2024, the total amount of co-investment by partners other than the EU is EUR 1 491 million. Including also investment towards Horizon 2020 beneficiaries, since 2020, the EIC Fund has crowded in over EUR 2.6 billion of additional investment[473].

The overall leverage effect of the EIC Fund is approximately 3:1[474]. For the Horizon Europe period, the leverage effect is equivalent to EUR 2.6 per euro invested by the EU, increasing to EUR 3.2 if only equity investments are considered. Convertible loans may be transformed into direct equity investments at a later point if enough matching partners are found. The co-investors are listed in the approval documents of the EIC Fund Advisory and Investment Committees. At the moment, information on co-investment to convertible loans is not channelled to the Fund's monitoring tools due to technical limitations. The EIB expects to make it available by the end of 2025.

The concept of leverage may also be used to encompass funding received by beneficiaries after project participation (a form of 'indirect' leverage). Information on additional investments collected by participants is currently not available to this evaluation for most programme parts: the first programme-wide data – as captured under the Key Impact Pathway 9 medium-term indicator[475] – will become available from 2025 onwards. The only programme part for which structured figures about additional investments are already available is the EIT: for several KICs, additional investments reported exceed by substantial margins the size of the EIT grant (most notably, over 30 times in the case of EIT KIC InnoEnergy). More data on additional investments collected by EIT KICs beneficiaries is available in Annex 7.

European Partnerships

Looking at co-investment only, partnerships leverage more resources than the rest of the Framework Programme[476]. When all partnerships are excluded, the leverage factor for the 'mainstream' programme is around 0.09, equivalent to EUR 2.96 billion in co-investment. For partnerships as a whole, the leverage factor for project activities is 0.62 (EUR 7.22 billion).

Among the main Horizon Europe types of actions, joint undertakings have the highest direct leverage factor (0.8). In the average JU project, 55% of total eligible costs are covered by the EU, and 45% by project participants.

Leverage factors in JUs are higher for participants classified as for-profit companies: they invested EUR 2.83 billion in projects, a direct leverage factor of EUR 1.23 per euro in EU contribution the projects received. Out of this, at least EUR 2.17 billion comes specifically from privately-owned enterprises, and at least EUR 313 million from state-controlled enterprises. These have a comparatively high leverage factor of 2.25 (against 1.15 for companies without public ownership).

[473] EISMEA, Scaling Deep Tech in Europe – the European Innovation Council Impact Report 2025. Available at: https://eic.ec.europa.eu/document/download/7b947b36-66cb-4471-a2d0-158d5ae6770f_en?filename=EIC-Impact-Report-2025.pdf
[474] Ibid.
[475] 'Scaling-up - Amount of public & private investment mobilised to exploit or scale-up results from the Programme (including foreign direct investments)'
[476] This indicator is called 'direct call leverage' in the BMR on partnerships, with an identical definition and calculation method.

All partnership types may also accept contributions from partners in the form of additional activities. The monetised value of the members' additional activities counts towards the partnership's leverage objectives – for some partnerships, these activities are the main source of leverage. Once additional activities are included, leverage factors for institutionalised partnerships increase significantly, with partners contributing to R&I activities already more than the EU contribution received to date (leverage factor higher than 1). However, availability and quality of data on additional activities varies – as does the level of Commission oversight on their content.

In principle, due to their design, co-funded partnerships leverage the most compared to the Horizon Europe contribution (leverage ratio of 2:1). However, Commission monitoring systems are currently unable to systematically track the status of these partnerships' implementation beyond the initial grants, as structured implementation data has not yet been included in central monitoring systems. This prevents the Commission from assessing how much of the leveraged funding comes from Member States, private partners, and from other EU budget sources, such as EU regional funds and the RRF. Co-programmed partnerships have the lowest leverage factor (0.14): by design, most of their leverage is supposed to come from additional activities beyond EU-funded actions and subsequent private investment after the pre-competitiveness phases.

The picture for institutionalised partnerships varies. Some of these partnerships have a longer track record, having existed in a similar organisational set-up for at least two programming periods (i.e. since before the start of Horizon 2020). In Horizon Europe, these 'older' partnerships have a substantially higher leverage factor than those that were created more recently. In particular, the three older EIT KICs have a leverage factor including additional activities, close to 3:1, but a gap between 'older' and 'newer' partnerships is also visible for JUs.

For details, see Annex 7.

EU Missions

The Commission launched the EU Missions in 2021 with a budget of EUR 1.9 billion, which was intended to attract further investment. At the time of writing, there is no systematic approach yet to monitoring additional funds leveraged by these initiatives (which would not have been spent on these causes/objectives without the EU Missions' influence). Leverage of EU funding will be tracked through the KIP Dashboard from 2025, and in 2026, a comprehensive Missions assessment will investigate funding beyond Horizon Europe, in particular shared management programmes.

Nevertheless, the Cities Mission has successfully pooled resources from the national level, in cases where Member States have committed additional funding to support the cities participating in the Mission to become climate neutral. The Cities Mission also mobilised support from the EIB (the EIB participates in the review process of Climate City Contracts, provides advisory services to Mission cities and ringfenced a lending envelope of EUR 2 billion to cities that have received the Cities Mission Label).

4.4.2. Horizon Europe-supported activities would not have been possible without EU funding

Collaboration networks across borders

One of the key aspects of Horizon Europe's added value is its ability to promote cooperation on a large scale across countries. Most national (or regional) programmes may fund bilateral or, more rarely, trilateral collaborations, but usually they do not fund wider collaboration networks[477]. Of the EUR 43.2 billion in grants signed by 6 January 2025 under Horizon Europe,

[477] European Commission (2024). Align, act, accelerate, p. 20. https://data.europa.eu/doi/10.2777/9106236.

81% were collaborative grants[478]. Since there are usually no limits to the number of participants in Horizon Europe consortia, these tend to be wide, including on average 11.3 participants[479].

The added value of collaboration is reflected in feedback from beneficiaries. The key elements of EU added value identified by beneficiaries include: (1) international cooperation and mobility opportunities for researchers; (2) access to world-class research and technology infrastructures; (3) support for research topics and areas not covered by national and regional R&I funding programmes; and (4) the drive for excellence through EU-wide competition for R&I funding[480].

Scale and scope of R&I support

Horizon Europe supports types of R&I that could not be funded at national and regional level. This is not only because of the extensive nature of the collaboration networks but also because the programme provides funding for a wide range of research topics. More specifically, there is clear relevance and added value for security research (Cluster 3) because most Member States except Germany, Austria, Bulgaria, Czechia, and Italy do not have an equivalent national programme in this field[481]. They therefore rely on Horizon Europe for the development of innovative solutions in civil security, border management, disaster resilience and the protection of critical infrastructures[482]. A project receiving Horizon Europe funding is perceived as trustworthy and relevant among stakeholders in the field of security[483].

One significant benefit of Pillar III programmes is their ability to address the financing shortfall encountered by innovative actors in their national setting. For example, EIC funding enables programme beneficiaries to scale up innovation that would otherwise be unfeasible. As highlighted by the beneficiaries interviewed, projects would have progressed at a slower pace and on a smaller scale without this funding[484].

The EU added value of Horizon Europe is also demonstrated by the fact that project proposals that were not selected for funding needed to be revised to secure national or regional sources of funding. According to the evaluation survey respondents, revisions to the projects included a reduced project scope (in terms of areas covered; 82%; 1 575 respondents), less complex methods (79%; 1 462 respondents), fewer research outputs (77%; 1 435 respondents), a smaller number of consortium partners (85%; 824 respondents) and shorter durations (75%; 1 368 respondents). As a result, projects were often funded at a smaller scale than what Horizon Europe would have offered.

Another significant aspect of the EU added value of Horizon Europe is the pooling of resources on a broader scale than at national level. A good example is rare diseases, where the low number of patients requires such a pooling to reach sufficient statistical levels[485].

The added value of Horizon Europe support to cross-border collaboration and networking is particularly visible in the widening part of the programme. Case study evidence shows that there are no grants available in widening countries that are comparable to those available under Horizon Europe widening actions, which aim to foster connections with leading partners and

[478] Analysis based on CORDA data with cut-off on 2 December 2024.
[479] Analysis based on CORDA data with cut-off on 2 December 2024.
[480] Based on responses from MSCA PF and ERC beneficiaries to a targeted survey carried between May and July 2023. Number of respondents for each topic: 1. 1 042; 2. 1 034; 3. 1 038; 4. 1 042. Excellent Science evaluation study, 2024, https://data.europa.eu/doi/10.2777/2295765; Innovative Europe Study.
[481] Enhancing security through research and innovation SWD(2021) 422 final; Resilient Europe evaluation study, 2024, Case Study 11, https://data.europa.eu/doi/10.2777/22355
[482] Resilient Europe evaluation study, 2024, Case Study 11. https://data.europa.eu/doi/10.2777/22355
[483] Ibid., p. 133.
[484] Innovative Europe Study, Chapter 8.1, page 91, referring also to relevant Case Studies 1 and 2.
[485] European Commission, Directorate-General for Research and Innovation, Rare diseases : a major unmet medical need, Publications Office, 2017, https://data.europa.eu/doi/10.2777/749056

boost the quality of the research produced in widening countries[486]. A separate study reveals that, from Horizon 2020 to Horizon Europe, widening countries teams have surpassed those from third countries' teams in terms of presence in consortia networks[487].

By bringing together resources, partners and infrastructure across countries, sectors and disciplines, EU R&I funding is able to support a range of initiatives of unparalleled scale and complexity[488]. This creates the necessary critical mass to strengthen the EU science-for-policy ecosystem.

Horizon Europe is designed to support key EU priorities. In the digital space, the programme has effectively identified and supported high-growth areas where the EU has the potential to take or reinforce its leadership[489]. Similarly, the programme has contributed to the European Green Deal, namely through Cluster 5 and Cluster 6 projects. It has enabled collaboration where it would otherwise not exist, particularly through solutions that make use of data generated via Earth observation[490].

4.4.3 Structuring effect of Horizon Europe and the European partnerships

Horizon Europe is supporting thousands of new collaborations between researchers, which has a structuring effect on the ERA, the single, borderless market for research, innovation and technology that is being built in the EU. In particular, based on their individual evaluations in annex of the SWD, all the European partnerships deliver EU added value through the development of long-lasting knowledge networks. SESAR exemplifies this by bringing all European air traffic management stakeholders together to support the entire ATM value chain and align with the Single European Sky initiative[491]. Similarly, the SNS JU (following 5G PPP), harnesses cross-border effects to accelerate the development of 5G and 6G technologies, securing a competitive edge for European tech companies[492].

All European Partnerships have a strategic research agenda or work programme that brings together the EU and other partners such as Member States, industries and foundations, to agreeing on joint priorities for funding. This is a key feature that distinguishes partnerships from other collaborative instruments[493]. For example, the tripartite approach of the Chips JU, which involves co-funding and joint decision-making with the private sector and Member States, promotes coordination with national activities, contributing to the ERA in the microelectronics field[494].

Each JU also brings added value by tackling sectoral or research fragmentation. One example is EuroHPC: previously, the EU had 27 different supercomputing programmes and lacked its own supercomputers. With the creation of EuroHPC, the EU has gained a prominent position as a world power in supercomputing with its own systems[495]. EU-Rail tackles the rail industry's

[486] Excellent Science evaluation study, Annex 2.7. https://data.europa.eu/doi/10.2777/9552959
[487] European Commission (2024). The Structuring effect of consecutive Framework Programmes for health research, Working Paper for the Resilient Europe evaluation support study, pp. 10-12 (The Structuring effect of consecutive Framework Programmes for health research - Publications Office of the EU).
[488] European Commission, Mitra, A., Canton, E., Ravet, J. and Steeman, J. (2024). The added value of European investments in research and innovation, p. 8. https://research-and-innovation.ec.europa.eu/knowledge-publications-tools-and-data/publications/all-publications/added-value-european-investments-research-and-innovation_en.
[489] European Commission (2024). Horizon Europe and the Digital & Industrial Transition, p. 90. https://op.europa.eu/en/publication-detail/-/publication/44b1b11b-7fa2-11ef-a67d-01aa75ed71a1/language-en.
[490] European Commission (2024). Horizon Europe and the Green Transition, p. 90. https://op.europa.eu/en/publication-detail/-/publication/c9383687-6420-11ef-a8ba-01aa75ed71a1/language-en.
[491] SESAR JU evaluation report in annex 19, p. 13.
[492] SNS JU evaluation report in annex 20, p. 13.
[493] Biennial Monitoring Report on European Partnerships, 2024, p. 19. https://data.europa.eu/doi/10.2777/991766.
[494] Chips JU evaluation report in annex 11, p. 16.
[495] EuroHPC JU evaluation report in annex 16, p. 15.

structural and geographical fragmentation by delivering via an integrated system approach, a high capacity, flexible, multi-modal and reliable integrated European railway network by eliminating barriers to interoperability and providing solutions for full integration, for European citizens and businesses[496].

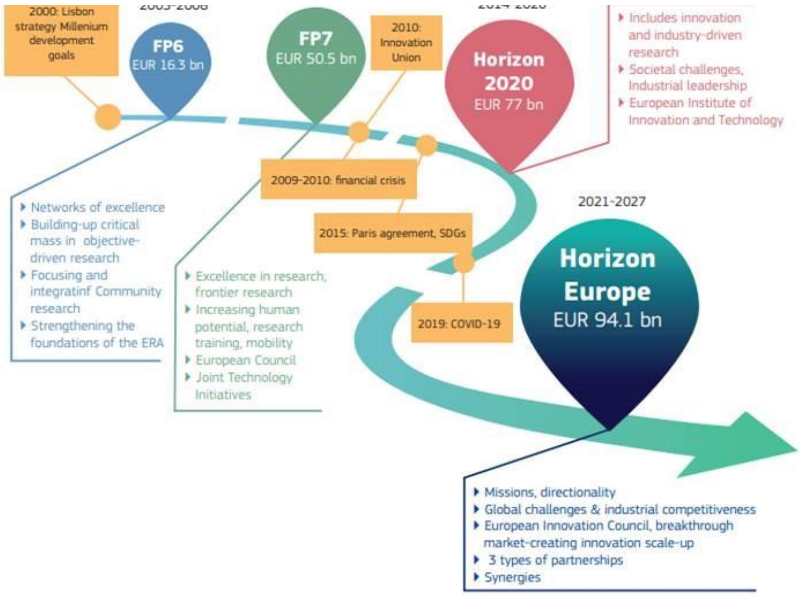
Half of the partnerships include a particular focus on funding high-TRL projects. Under the CBE JU, the deployment of large-scale, first-of-a-kind projects at TRL 8, known as Innovation Action-Flagships (IA-FLAG), has upscaled the bio-based sector to market level, with a high participation of SMEs (51% of all CBE funding as of December 2023)[497,498].

4.5 Relevance

4.5.1. Responding to the needs of beneficiaries

2024 marked the 40th anniversary of the first framework programme for research and innovation. Certain parts of Horizon Europe have existed in several framework programmes, demonstrating these parts' value and relevance. This includes thematic priorities (currently the clusters in Pillar II), research infrastructures, the ERC, the MSCA, widening participation, strengthening the ERA, direct R&I actions through the JRC, as well as the Euratom programme. They have been reformulated and regrouped in various ways; however, they show overall a remarkable degree of continuity. Other features of the programme were added more recently – in Horizon Europe, new features included greater mission and impact-orientation (with five EU Missions and nine Key Impact Pathways for the programme), while also integrating the EIC as a fully-fledged programme part.

Figure 15: Evolution of the framework programme for R&I



Source: DG RTD, SRIP Chapter 2.1

[496] Europe's Rail JU evaluation report in annex 15, p. 17.
[497] European Commission, SME participation in Horizon Europe, 2024, p. 24. https://data.europa.eu/doi/10.2777/576670
[498] CBE JU evaluation report in annex 12, p. 3.

The mechanisms used to shape these changes included the stakeholder consultation, and the interim and ex post evaluations of Horizon 2020. Stakeholders are involved in the preparation of the strategic plans and the work programmes. For example, the largest ever stakeholder consultation on the framework programme, 'Public consultation on the past, present and future of the European Research & Innovation Framework programmes 2014-2027', started in December 2022 and closed in February 2023 with 1 663 replies associated with the section on Horizon Europe, as well as 136 position papers from various stakeholders. It supported foresight activities[499] and other analyses[500], as well as the strategic plan itself[501].

These analytical activities in particular showed that the needs that must be addressed by Horizon Europe are evolving[502]. The past few years have been marked by global crises, including the COVID-19 pandemic, the Russian invasion of Ukraine, the energy crisis and high inflation, and the increased frequency of climate-related extreme events. These recent events – along with longer-term challenges such as climate change, biodiversity loss, pollution, decarbonisation, the green and digital transition, resilience, and competitiveness – provide an opportunity to 'build forward better'. Moreover, the new geopolitical context has placed the EU's just green and digital transition in the spotlight, requiring the reduction of strategic dependencies, for example on critical technologies, raw materials and finite critical minerals, and the speedup of the net zero industrial transformation to strengthen the EU's resilience and foster its leadership in key technological domains and (global) value chains. The framework programme for research and innovation, with its dedicated instruments and objectives, has a direct impact on both the shorter-run crises and the longer-run challenges. The foresight and other analytical activities underpinning its Strategic Plan – including this evaluation – equip the programme with the information necessary to adapt and respond to evolving needs in the future.

One of the programme instruments that was rationalised under Horizon Europe in order to respond more effectively to needs and EU priorities are the European Partnerships. Their number decreased by more than half (more details on this in section 4.2.3. on simplification). The partnerships focus on the main EU priorities described below.

- **Strategic autonomy and global positioning**: Partnerships, such as EuroHPC, CHIPS, Global Health EDCTP3, SNS, Photonics, and Made In Europe, focus on ensuring the availability of components, technologies and know-how [503]. EIT Digital and EIT Manufacturing also contribute to this priority, by building and scaling ventures, support the commercialisation of innovation and upskilling talents in critical technologies[504].
- **Green transition, sustainability and biodiversity**: The partnerships under Cluster 5, the co-programmed partnership on clean steel and zero-emission mobility (2Zero), together with the EIT Climate-KIC, EIT InnoEnergy and EIT Urban Mobility, contribute to reducing greenhouse emissions, designing more efficient transport and infrastructure, supporting a clean energy transition and circular economy, and fostering a competitive and innovative European hydrogen economy and battery industry[505]. The partnerships under Cluster 6 and EIT Food contribute to a better sustainability of food systems, improving the good

[499] Commission: Directorate-General for Research and Innovation, Weber, M., Wasserbacher, D. and Kastrinos, N., *Foresight towards the 2nd Strategic Plan for Horizon Europe*, Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2777/77971.
[500] Commission: Directorate-General for Research and Innovation, *Horizon Europe strategic plan 2025-2027 analysis*, Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2777/637816
[501] European Commission, Directorate-General for Research and Innovation, Horizon Europe strategic plan 2025-2027, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/092911
[502] Horizon Europe strategic plan 2025-2027 analysis, 2023, p. 9.
[503] Digital & Industrial Transition evaluation study, 2024. Annex I, p. 40. https://data.europa.eu/doi/10.2777/489648
[504] European Commission, BMR 2024 on partnerships in Horizon Europe, 2024, p. 64.
[505] Ibid, p. 74.

environmental status[506] by 2030, mainstreaming biodiversity in key sectors and policies, and improving livelihoods, health and access to water[507].

- **Digital transition and industrial competitiveness**: Partnerships under different clusters have integrated elements to facilitate the digital transition. The most relevant are under Cluster 4, which, together with EIT Digital, promote digitisation and a competitive and secure EU data economy[508]. Examples of other partnerships include the CBE, which develops innovative and sustainable bio-based solutions and deploys them in the market (see Annex 12).

  All joint undertakings have as one of their primary objectives to 'secure and enhance Union competitiveness'. As a thematic example[509], one of the three specific objectives of the Innovative Health Initiative JU is to 'drive cross-sectoral health innovation for a globally competitive European health industry and contribute to reaching the objectives of the new Industrial Strategy for Europe and the Pharmaceutical Strategy for Europe'. All projects supported by this JU include mandatory contributions from the health industry that participates in joint projects with academia, hospitals, SMEs and others[510].

- **Health and preparedness:** EDCTP2 delivered results related to COVID-19, antimicrobial resistance, malaria, tuberculosis and HIV. In addition, Horizon Europe continues the course of Horizon 2020 and FP7 in contributing to pandemic research preparedness and response. Support for research related to the COVID-19 pandemic continued, and a response to the 2022 mpox epidemic was mobilised. More details on this are in Section 4.5.3. on responding to emergencies.

  The IMI2 JU (IHI's predecessor) delivered results on diagnosing or treating conditions that significantly affect the EU population such as cancer[511], cardiovascular diseases[512] and diabetes[513]. It contributed to developing Ebola vaccines[514] and improved methodologies for studying drug safety and running clinical trials with adults[515] and children[516], the latter involving over 250 hospital sites.

In addition, all the four types of funding set out in the EU Financial Regulation[517] – grants, prizes, financial instruments and procurement – are combined in the implementation of Horizon Europe, in order to respond to the beneficiaries' needs. The programme has also proved to be flexible in combining these instruments. For example, the EIC uncoupled its grant and equity funding for start-ups, so that applicants can either bid for blended support while being able to postpone raising equity to a later stage or bid for only a grant or equity.

4.5.2. Strengthening Europe's competitiveness

Promoting the EU's competitiveness is one of the general objectives of Horizon Europe. Private and public sector investment is a necessary condition for strengthening Europe's

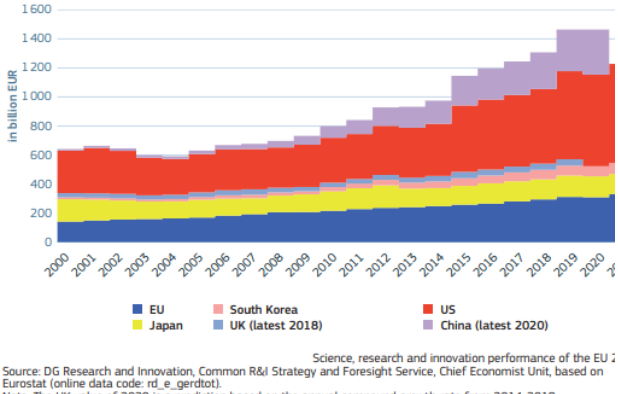
[506] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).
[507] European Commission, BMR 2024, p. 76.
[508] Ibid, p. 80.
[509] Art 115.1(c) of Regulation 2021/2085 establishing Joint Undertakings under Horizon Europe.
[510] Resilient Europe valuation study, Case Study 2 on IMI2 and IHI, p. 233.
[511] https://cordis.europa.eu/project/id/115749
[512] https://cordis.europa.eu/project/id/116074
[513] https://cordis.europa.eu/project/id/945268 and https://cordis.europa.eu/project/id/821508
[514] https://cordis.europa.eu/project/id/115854
[515] https://cordis.europa.eu/project/id/853966/results
[516] https://cordis.europa.eu/project/id/777389
[517] Regulation (EU, Euratom) 2018/1046 on the financial rules applicable to the general budget of the Union, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R1046

competitiveness. Although the EU has set itself an ambitious R&D investment target of 3% of GDP, it is struggling to achieve this objective. In 2022, the EU would have needed to invest an additional EUR 123 billion to reach the 3% target, more than the budget of an entire seven-year framework programme for R&I[518].

While the EU has increased its R&D investment over the past two decades[519], the R&D *intensity* gap between the EU and the US and South Korea has also widened (Figure 15)[520]. In the EU, this gap is mainly due to a lack of private R&D investment. For example, venture capital funds raised in the EU are equal to only 5% of global venture capital finance, compared with 52% in the US[521]. Compared with the US, the EU also lags significantly behind in the development and adoption of digital technologies, which are a key enabler of innovation[522,523]. More generally, the EU lags behind other key players in strategic, productivity-enhancing technologies, including in the digital domain. It remains a leader in green infrastructure, outperforming both China and the US in areas related to climate adaptation and energy technologies and environment, but it has not kept up with progress in more complex technologies[524].

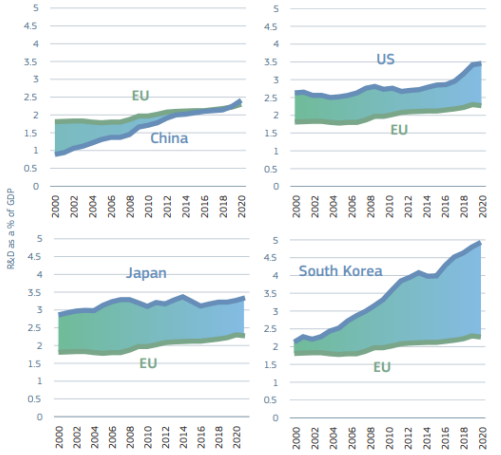
In addition, the valorisation of R&D outputs remains a challenge: only about one-third of the patented inventions registered by European universities or research institutions are commercially exploited[525].

Figure 16: R&D expenditure in billion EUR, 2000-2021



Science, research and innovation performance of the EU 2
Source: DG Research and Innovation, Common R&I Strategy and Foresight Service, Chief Economist Unit, based on Eurostat (online data code: rd_e_gerdtot).
Note: The UK value of 2020 is a prediction based on the annual compound growth rate from 2014-2019.

Figure 17: The EU's R&D intensity gap with other major economies



Science, research and innovation performance of the EU 2024
Source: DG Research and Innovation, Common R&I Strategy and Foresight Service, Chief Economist Unit, based on Eurostat and OECD data.

The objective of competitiveness is clearly the focus of Pillars II and III. Pillar II seeks to promote industrial competitiveness throughout the R&I journey. Work programmes have also increasingly focused on key enabling technologies (KETs) and critical technologies for industry,

[518] DG RTD, SRIP chapter 2.1, p. 49. https://data.europa.eu/doi/10.2777/965670
[519] Ibid., p. 47
[520] Ibid., p. 31
[521] European Investment Bank (2024). The scale-up gap: Financial market constraints holding back innovative firms in the European Union, page 22. https://www.eib.org/attachments/lucalli/20240130_the_scale_up_gap_en.pdf.
[522] DG RTD, EIS, chapter 1, p. 7-8
[523] European Commission, Directorate-General for Research and Innovation, Science, research and innovation performance of the EU, 2024 : a competitive Europe for a sustainable future, pages 86-88, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/965670.
[524] European Commission, Directorate-General for Research and Innovation, Science, research and innovation performance of the EU, 2024: a competitive Europe for a sustainable future, page 38, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/965670.
[525] Draghi, M., "The future of European competitiveness – A competitiveness strategy for Europe", 2024, p. 25.

supporting convergence and cross-fertilisation[526]. Pillar III aims to fill the financing gap and strengthen innovation ecosystems.

The collaborative nature of Horizon Europe (see also Section 4) is key to promoting competitiveness, since it offers opportunities for European businesses and research organisations to forge international partnerships and access global markets, fostering economic growth[527,528]. For researchers, respondents to the survey highlighted how MSCA contributed to improving the working conditions of researchers, which in turn improve the attractiveness of their research organisations[529].

Successful and unsuccessful applicants that responded to the surveys highlighted the relevance of the programme for competitiveness. Asked whether Horizon Europe provides sufficient funding opportunities across a range of specific areas, 47% (7 323) responded that the programme's research focuses on technological applications that are important to industrial competitiveness to a 'very large' or 'large' extent[530]. This was 53% (2 938) among beneficiaries.

4.5.3. Response to emergencies and changing priorities

The challenges addressed at the start of Horizon Europe are still present: climate change, biodiversity loss, increasing levels of pollution, health threats, security threats, and the digital transition are as relevant today as in 2021. Therefore, Horizon Europe remains as relevant now as when it started; in addition, it was able to adapt to changing circumstances. The Russian invasion of Ukraine and the COVID-19 pandemic highlighted the need for flexible use of R&I instruments for short-term responses to unexpected crises and global challenges[531]. The evaluation of Horizon 2020 found the programme's response to new emerging challenges such the COVID-19 crisis to be even faster than it was for Ebola and Zika[532]. Similarly, programme parts across all Horizon Europe pillars responded to COVID-19, mpox and Ukraine emergencies – some examples are provided below and a more detailed description is in Annex 10.

- Cluster 1 is the only cluster with an 'emergency action fund', whose release can be triggered by a policy announcement (WHO's global pandemic)[533]. It mobilised resources and boosted preparedness for health emergencies. The first emergency call under Horizon Europe[534] provided EUR 123 million to tackle coronavirus and its variants[535]. This support advanced our understanding of the virus by developing diagnostics, treatments and vaccines, and fed into public health policies. For instance, the EuCARE project provided insights into the

[526] Viscido, S., Lotito, A. and Boekholt, P., Horizon Europe and the digital & industrial transition: interim evaluation support study, p. 44, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/845650.
[527] Evaluation study on excellent science, p. 35, 2024. https://data.europa.eu/doi/10.2777/2295765.
[528] Denham, S., Stančiauskas, V., Dėlkutė-Morgan, R., Kazlauskaitė, D., et al., Evaluation support study on resilient Europe, p. 49, Publications Office of the European Union, 2024. https://data.europa.eu/doi/10.2777/797281.
[529] Evaluation study on excellent science, annexes, p. 88, 2024. https://data.europa.eu/doi/10.2777/9552959.
[530] For all applicants, 8% of respondents responded either 'to a small extent' or 'not at all' (7 323 respondents) and 26% responded 'do not know/not applicable' (4 095 respondents). For beneficiaries, these numbers are 5% (293 respondents) and 26% (1 460 respondents), respectively.
[531] Digital and Industrial Transition evaluation study, 2024, p. 25. https://data.europa.eu/doi/10.2777/845650
[532] SWD (2024) 29, p. 90. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52024SC0029
[533] The possibility for the mobilisation of emergency research funds is expressed as an 'other action' integrated in the Horizon WP for Health since 2018: Horizon Europe 2021-2022 work programme (p. 173): https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-4-health_horizon-2021-2022_en.pdf; and Horizon Europe 2023-2024 (p. 222): https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-4-health_horizon-2023-2024_en.pdf
[534] Cluster 1 – funded under the 'label' of 'HERA incubator'.
[535] https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1548

severity of the different variants of SARS-CoV-2[536] and showed that opening schools did not increase transmission in Italy, Germany and Portugal[537].

- In response to the mpox outbreak in 2022, the EU mobilised EUR 17 million of emergency funding under Cluster 1 to support European clinical research. For instance, the MPX-RESPONSE project is evaluating therapies against the disease[538].
- A benchmark study of the United States medical research agency (National Institutes of Health) response to COVID-19 reported that Horizon Europe demonstrated flexibility in coping with changing circumstances in the world, including COVID-19. The study noted that the programme continues its funding efforts and directs initiatives on COVID-19 and coronavirus research, including preparations for the emerging variant [539].
- The ERC identified 183 projects relating to COVID-19, such as diagnostics and treatments (including vaccines), medical devices, digital tools, AI, immunity, infection and pathology, social and economic behaviour, wellbeing and crisis management[540].
- The Marie Skłodowska-Curie Actions supported doctoral candidates and post-doctoral researchers from Ukraine affected by the war by setting up the EUR 25 million MSCA4Ukraine scheme in 2022[541]. A EUR 10 million top-up was subsequently awarded in April 2024 to allow 50 additional researchers to continue their work safely in academia, businesses, research centres and public institutions based in the EU and countries associated to Horizon Europe. In total, 175 researchers from Ukraine had received a fellowship.
- The EIC and EIT published dedicated calls to tackle COVID-19[542]. The EIC also organised events to enable EIC companies to pitch to investors, companies and public healthcare authorities looking for innovative solutions to COVID challenges[543].
- At the end of 2023, the EIT set up the EIT Community Hub[544] in Kyiv, working to bridge Ukraine and the EU's innovation ecosystem and boost ideas and businesses emerging from Ukraine[545]. The overall EIT support has so far channelled more than EUR 2 million to Ukraine between 2022 and 2023.
- Following the start of the Russian invasion of Ukraine, Cluster 5 was better aligned with REPowerEU, resulting in EUR 172 million funding for strengthening the EU's energy independence[546].

What messages emerged from the targeted evaluation survey of Horizon Europe beneficiaries?

Across the Horizon Europe pillars, the percentage of beneficiaries who 'strongly agree' or 'rather agree' that **Horizon Europe gives more flexibility to respond to changing socio-economic needs compared with national and/or regional research funding** ranged from 45.6% in Pillar I and 54.2% in WIDERA actions. In contrast, the percentages of beneficiaries who 'Strongly disagree' or 'Rather disagree' were relatively low, ranging from 4.8% in Pillar III to 8.4% in Pillar II.

At project level, 13-15% of beneficiaries across Pillars II, III and WIDERA actions reported that the **COVID-19 pandemic was a challenge** to a 'large or very large extent', with a higher share of respondents under pillar I (19%). Similarly, the share of responding beneficiaries that reported that the **pandemic was not a challenge** when carrying

[536] https://www.thelancet.com/journals/lanepe/article/PIIS2666-7762(24)00021-8/fulltext
[537] https://www.sciencedirect.com/science/article/pii/S1201971223007634?via%3Dihub
[538] https://www.nature.com/articles/s41591-023-02393-6
[539] Resilient Europe evaluation study, Annex 5, benchmark study 1, p. 21. https://data.europa.eu/doi/10.2777/22355
[540] European Research Council, COVID-19 Frontier research in the spotlight, 2022. https://erc.europa.eu/sites/default/files/2022-08/COVID19-Frontier_research_in_the-spotlight.pdf
[541] Ibid, pp. 843-844, https://data.europa.eu/doi/10.2777/9552959
[542] Innovative Europe evaluation study, 2024, Chapter 9.1, p. 98. https://data.europa.eu/doi/10.2777/499132
[543] Deep Tech Europe. EIC Impact Report, 2021, p. 50. https://data.europa.eu/doi/10.2826/005280
[544] Innovative Europe evaluation study, 2024, Chapter 4.1, pp. 40-41. https://data.europa.eu/doi/10.2777/499132
[545] https://eit-ris.eu/ukraine/
[546] https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/commission-invests-eu172-million-research-and-innovation-projects-support-eu-energy-independence-2024-01-11_en#:~:text=The%20European%20Commission%20has%20awarded,independence%20of%20the%20European%20Union.

out their project was lower in Pillar I (23%), in contrast to Pillars II, III and WIDERA actions (31-36%). *NB. ERC beneficiaries were not asked this question.*

5. What are the conclusions and lessons learned?

5.1 Conclusions

To what extent has Horizon Europe been successful so far and why?

Horizon Europe is **on track to achieve its objectives**: the number of peer-reviewed publications, patent applications and other Key Impact Pathway indicators are at a similar level as in the previous programme, Horizon 2020, at the same stage of monitoring.

Regarding research, over 79% of all publications are reported by beneficiaries as published with open access, a moderate increase compared with Horizon 2020 at the same stage (69.8%). The programme continues to support excellent science: between 1985 and 2023, it supported 35 Nobel Prize winners, two more than was reported in the *ex post* evaluation of Horizon 2020. It strengthens human capital in research and innovation by boosting researchers' skills and providing unique career development opportunities.

Horizon Europe played a key role in mobilising additional R&I funding and it contributed to the EU's target of investing 3% of GDP in R&D. It offered opportunities for European businesses and research organisations to forge partnerships with other entities in Europe and beyond, fostering economic growth. Nevertheless, Horizon Europe investments only accounted for about 10% of public R&D expenditure in the EU; the rest of the funding comes from the Member States and regional bodies. While this investment in innovation is crucial for productivity, there are other factors at play such as the macroeconomic environment, property right enforcement, openness to trade, effective government, and properly regulated markets.

The programme is **effectively contributing to the twin transition**: its climate contribution was 35% of its funding by the end of 2023 – on track to reach the legal target, which was not achieved in Horizon 2020. Spending on biodiversity objectives exceeds the target level for 2024: 8.7% in 2023 (compared with the 7.5% target). Horizon Europe investments in the digital transformation for 2021-2023 are estimated to be at 33% of its budget (compared with 32% in Horizon 2020). The programme combines agility and long-term competence building in strategic areas for the Digital and Industrial Transition. The systemic and "technology neutral" approach enhances its capacity to deliver integrated solutions to complex challenges in this field.

Three macro-economic models used in this evaluation confirm that **Horizon Europe contributes to EU's GDP growth, according to expectations**. The limited share of Horizon Europe funding that has been allocated in the first three years of the programme is estimated to contribute to an increase in EU GDP of up to EUR 8.1 billion yearly between 2021 and 2050, on average.

10 077 SMEs received grants for a total of EUR 7.4 billion (17% of all the budget allocated). Pillar II involves 70% of all SME unique participants and provides 68% of all EU contribution for SMEs (EUR 4.7 billion). Approximately 15% of the joint undertakings' funding went to SMEs. In Pillar III, 32% of all EU contributions went to SMEs. In addition to this, the EIC Fund's approved equity investments for start-ups and SMEs add another EUR 1.7 billion for SMEs in the Horizon Europe period, bringing the total investment to EUR 9.1 billion.

Horizon Europe has tripled the budget for **widening** participation to 3% of the programme budget (compared with its predecessor Horizon 2020) and introduced several measures to increase the participation of organisations from widening Member States in the programme. First results of this increased focus on widening are positive both in terms of participation and the number of newcomers. The Horizon Europe Widening Member States have received 14% of the funding to

date, compared with 9% of the total funding they received in Horizon 2020. The rate of newcomers in widening Member States is 53%, which is greater than in non-widening ones (49%). In addition, 58% of collaborative projects include a participant from a widening Member State.

The **EU Missions** are proceeding towards their goals despite a cumbersome governance system and an incomplete monitoring framework for reporting on their progress.

Institutionalised European partnerships had an impact on the creation and diffusion of new high-quality knowledge and skills, as well as on the EU's global leadership and value chain resilience in key technologies. A smaller number of JUs had an impact on developing and accelerating the uptake of innovative solutions. **The partnerships' transparency and openness improved,** although SMEs and participants from widening countries still face some challenges. The number of new organisations involved in the partnerships slightly increased from 2022 to 2024: most of the 308 new organisations were associated with the EIT KICs, while other institutionalised partnerships had few newcomers. The share of SMEs members increased more than that of universities and private organisations between 2022 and 2024, primarily thanks to participation in the EIT KICs. Only three JUs disclosed SMEs as members: SNS, Clean Aviation, Single European Sky. Participation from widening countries has improved, but some partnerships still struggle to attract organisations from Central and Eastern Europe.

In addition to the EIT KICs who all prepared their phasing-out strategies to become financially sustainable after 15 years, three European partnerships have produced a phasing-out plan. Among the institutionalised partnerships, EIT InnoEnergy, EIT Digital, and EIT Climate-KIC reached the end of their partnership status in December 2024 and are continuing their activities as financially sustainable ecosystems with less EIT funding.

The **programme's internal coherence is hindered by a high number of instruments, which nevertheless achieve a broad TRL coverage (including low TRLs in Pillar II).** In Pillar II, there are three impact-oriented streams of activities under way (the EU Missions, European Partnerships and clusters), each with its own governance and often weak links between themselves (in particular between the Missions and partnerships). In Pillar III, there is overlap in support provided by the EIC, EIE and EIT in terms of activities, TRL levels covered and groups targeted – each with its own governance.

The overall landscape of EU programmes supporting innovation and deployment of research is increasingly complex and difficult to navigate for the beneficiaries targeted. Horizon Europe is pursuing synergies with 20 EU programmes – up from 13 at the time of the *ex post* evaluation of Horizon 2020. Developing synergies is labour-intensive: the Commission made efforts in work programme coordination, the development of new support actions and a guidance notice (ERDF), and monitoring bridging instruments and bonus points in project evaluation. Existing synergy tools have been more widely deployed (Seal of Excellence) and strengthened (combined funding under Teaming projects). New mechanisms such as transfers from national ERDF programmes to Horizon Europe have been used in two instances. Cumulative funding exists with Member States using their ERDF funds as contributions to European Partnerships. EU programmes have different programming cycles and timelines, which create challenges for coordination.

The **co-creation approach** was introduced in Horizon Europe to foster synergies with EU policies and programmes. A wide range of Commission departments, Member States and the European Parliament, as well as representatives from industry participate in setting priorities and the budget allocation, through complex governance arrangements.

The **Seal of Excellence** continues to facilitate synergies with national and regional programmes: it was awarded to 7 166 proposals that could not be funded due to budget limitations in 2021-2024.

What costs are borne by the beneficiaries and applicants?

Beneficiaries' administrative costs: Beneficiaries are expected to spend **between EUR 4.75 billion and EUR 6.47 billion** on administrative costs on projects signed under Horizon Europe so far over the project lifetime. This is equivalent to 9% - 12% **of the total project cost.** The interim estimate is an order of magnitude higher than the previous (non-robust) estimate for all of Horizon 2020. The difference should not be interpreted as a change in costs but is primarily due to improvements in data quality and survey question design.

Costs of applicants: Overall, stakeholder feedback signals there has been no substantial shift in the proposal preparation effort required to apply for Horizon Europe compared to Horizon 2020.

Results of the evaluation's large, targeted survey suggest that consortium coordinators and mono-beneficiaries typically spend between **36 to 45 person-days on a proposal**, in addition to the **16 to 25 person-days** typically spent by consortium partners. **Consortium size** is a dominant factor influencing the time cost of coordinators.

So far, the application costs of all applicants to Horizon Europe are estimated to add up to EUR 1.92 billion to EUR 2.82 billion. This estimate is based on Horizon Europe's committed operational expenditures up to 2024, therefore not covering the entire programme. It corresponds to an **average cost per proposal of EUR 21 000 to EUR 32 000**, compared with an estimate of EUR 18 000 to EUR 37 000 under Horizon 2020. Our level of confidence in the Horizon Europe estimate is higher than in that of the Horizon 2020 final evaluation. The difference between the estimates for the two programmes should not be interpreted as an underlying change in costs but is due to an improvement in the quality of evidence and estimation method.

The overwhelming majority (74-80%) of Horizon Europe proposals reaching the quality threshold have been written without the involvement of external consultancies. Well over half of Horizon Europe applicants received support to prepare their proposals from a range of sources, primarily from **specialised departments in the organisation** (51%), the **National Contact Points** (19%) and **consultancy firms inside or outside the consortium** (17%). Around 30% of the respondents indicated that they had not used any source of support.

Time-to-Grant target: Horizon Europe without the EIC reaches a TTG of 241 days (240 days when excluding EIC Accelerator only), staying below the performance of Horizon 2020 without the SME Instrument (209 days) but still on the target. While the average time-to-grant period is longer than under Horizon 2020, Horizon Europe's performance is meeting the target of 245 days for all programme parts to which it applies.

Horizon Europe's **public sector Benefit Cost Ratio** (BCR) suggests the programme generates **value-for-money** for the EU: **One euro of costs to society associated with the programme is estimated to bring about 5 to 6 euros of benefits for EU citizens (measured through GDP impact) in the period up to 2045**.

What were the results of the simplification efforts?

Simplification of the Partnership landscape: The number and types of partnerships were significantly reduced, from 120 partnerships in Horizon 2020 down to 60 in Horizon Europe.

Beneficiaries of lump sum grants (excluding ERC Proof of Concept grants) are estimated to **typically save between 96 and 128 person-days per grant,** as financial reporting documents no longer have to be submitted. ERC Proof of Concept lump sum beneficiaries typically save 6

to 8 person-days per grant. In addition, beneficiaries of **larger lump sum grants save the cost of a certificate on the financial statements** (CFS), which typically costs **EUR 4 500**.

At interim evaluation stage, only considering the grants that have been signed to date, **lump sum funding is estimated to already have secured savings for beneficiaries of between EUR 49.8 million and EUR 63.4 million** over their projects' lifetime (incl. ERC PoC). This is equivalent to 1.6% - 2.1% of the total grant value of lump sum grants and 14% - 30% of lump sum beneficiaries' administrative costs. The use of lump sum funding under Horizon Europe is scheduled to broaden and pick up speed in the coming years. **The potential for future simplification from lump sum funding** in the remaining years of Horizon Europe is expected to **add EUR 276 million to EUR 351 million in reporting burden reduction.**

The **blind evaluation of proposals** was proven to be feasible within the legal framework and the operational context of the R&I framework programme.

A reformed approach to the **ethics appraisal process** has brought simplifications for a large share of the proposals submitted to Horizon Europe.

The implementation of **monitoring and reporting** provisions in the Horizon Europe Regulation is partially complete. A single database (CORDA) exists and includes implementation data for all parts of the programme. Nonetheless, the central database remains incomplete in several aspects, including the EIC Accelerator and European Partnerships, because of technical issues linked to the implementation of new instruments and slow integration of data for actions managed outside of Commission IT systems. This affects the calculation of success rates and other programme statistics.

How has Horizon Europe made a difference so far?

Horizon Europe supports research that could not be funded at national/regional level, in particular collaborative actions in Pillar II involving multiple organisations from different countries, more than would be possible at national or regional level. Under Pillar I, projects support international cooperation and mobility opportunities for researchers, access to world-class research and technology infrastructures, and a drive for excellence through EU-wide competition for research funding. Horizon Europe also supports research topics and areas not covered by national and regional R&I funding programmes or where European-level action adds value in helping solve global challenges.

Additionally, the scale of Horizon Europe support is generally greater than national and regional funding: applicants that were unsuccessful in Horizon Europe and went on to look for additional funding had to reduce the scope and ambition of their projects. With its partnerships and participation in global consortia, the programme also aligns the R&I landscape in the EU and even globally, preventing duplication and addressing fragmentation by setting common strategic research agendas.

Horizon Europe brings co-investment from participants in research and innovation. To date, project participants have invested a total of EUR 10.2 billion of their own resources in Horizon Europe projects. Each euro the EU is investing in Horizon Europe R&I projects directly attracts additional R&I investments of about EUR 0.24 (almost the same as in Horizon 2020). This factor is higher for private for-profit entities: with each euro of EU contribution, Horizon Europe leveraged around EUR 0.5 in co-investment. European Partnerships, introduced to pool and align resources, have helped to increase the leverage effect of EU R&I investment and have a leverage factor of over 0.6 (EUR 7 billion as of December 2024). However, most JUs need additional activities to reach or approach an equal contribution between the EU and partners (leverage factor of 1) as private co-investment in call activities is usually not enough to match the contribution of the EU.

In European Partnerships, additional activities are activities that are not directly funded by the EU, but align with and contribute to the partnerships' objectives. Institutionalised partnerships, such as the EIT KICs and JUs, have the highest leverage factor when these activities are included, especially looking at the longer standing ones (2.83 for the first three KICs set up in 2010, and 1.76 for older JUs and Article 185 partnerships). When aggregated, additional activities constitute by far the largest source of leverage of partnerships.

The Innovative Health Initiative and EDCTP3 reported financial contributions from JU members to project activities, making 'cash' contributions to R&I expenditures. All other JUs reported that financial contributions from partners were used exclusively to cover administrative costs. This means that their cash contributions funded the running of JUs but did not contribute to the budget for the calls for proposals.

Three years in, does Horizon Europe remain relevant?

The relevance of Horizon Europe is confirmed, as private and public sector investment in R&D remains a necessary condition for strengthening Europe's competitiveness. With the framework programme's increased budget, the average success rate of proposals increased from 12% in Horizon 2020 to 16.4% in Horizon Europe. However, only 30.1% of the high-quality proposals could be funded with the available budget - an additional EUR 81.77 billion would have been needed in 2021-2024 to fund them all.

In addition, Horizon Europe showed its relevance in **responding to emergencies and changing priorities**, such as the COVID-19 pandemic and the Russian invasion of Ukraine. The first Horizon Europe call tackled the COVID-19 pandemic. Programme parts across all Horizon Europe pillars directed funding and initiatives to COVID-19 and coronavirus research and support for researchers from Ukraine.

The valorisation of R&D outputs remains a challenge: only about one-third of the patented inventions registered by European universities or research institutions are commercially exploited. The financing gap between the EU and the US is observed at all stages of development but remains more prominent in the scale-up phase. In Horizon 2020, there was a gap during the EIC Pilot stage for TRL 3-6 support as the EIC Launchpad Pilot offered only relatively small grants for bridging the 'valley of death' for organisations looking to commercialise the outputs of their research. The Transition instrument fills this gap and enabled the EIC to cover the entire TRL scale. Only the EIC Accelerator offers direct equity investment in companies with options for grant, blended finance (grant and equity) or equity-only support – this is where the EIC is unique in the framework programme. The EIT KICs are also developing innovative products and services, starting and supporting new companies The EIT's involvement in Academies is a unique support for skills building and learning, which does not exist in other Innovative Europe programme parts. The EIT is also distinct in the sense that it is present 'on the ground' in all Member States and thus offers direct support.

International cooperation in research and innovation plays a key role for European competitiveness, building and making use of partnerships around the world. Through improved reciprocity clauses, Horizon Europe opens access to resources, know-how and scientific excellence that are developing outside the EU.

Gender equality continues to be strengthened in the programme: the 50% political commitment relating to the share of women participating in advisory and expert groups was recently met and currently stands at 51% (up from 43% in Horizon 2020). The share of women in expert evaluation panels stands at 45%, (up from 42% but still below the 50% target). The share of project coordinators who are women increased from 24% in Horizon 2020 to 31% in Horizon Europe, while the share of researchers still hovers at 38%. These results correspond to the under-

representation of women in senior academic and decision-making positions in the EU generally. However, the programme exceeds the EU average share of women researchers (34%).

Horizon Europe changed the approach to social sciences and humanities (**SSH)** from a cross-cutting issue to requiring all projects to take these disciplines into account when appropriate. In addition, the Commission launched dedicated SSH calls for proposals. The evaluation could not draw a conclusion on these efforts as the first monitoring report on SSH in Horizon Europe will be published in 2025.

5.2 Lessons learned

The final evaluation of Horizon 2020 identified the need to broaden participation in the programme. This interim evaluation of Horizon Europe noted increased participation in widening Member States, as well as more SMEs in some European Partnerships.

The final evaluation of Horizon 2020 flagged the need to **monitor the framework programme's contribution to EU priorities and competitiveness**. The Key Impact Pathway data for short-term indicators is reported in this evaluation SWD for the first time. For future publications and the final evaluation, the medium- and long-term indicators should also be developed and reported on. Efforts to complete the central database with data on all programme parts should continue. In addition, more attention could be paid to the monitoring and evaluation of expected effects outlined in work programmes. The lack of results indicators and targets makes it difficult to assess their contribution to addressing global challenges and European industrial competitiveness.

The **new approach taken to strategic planning and programming in Horizon Europe**, as well as the impact orientation of the programme and projects, made the process more participatory through co-creation and added new requirements in the application forms. In the future, any new layers of decision-making and engagement in programming could be preceded by a simplification of existing complex governance arrangements.

It is useful to **include emergency provisions in work programmes**, as was done by cluster 1 on health. Inclusion of emergency provisions could be considered in other parts of the programme.

Additional efforts could also **improve the monitoring of European Partnerships** as data consistency and quality varies greatly across different types of Partnerships and is affected by significant lags and inconsistencies. Integration of proposal and grant management tools of partnerships in the IT systems used for the rest of the programme should become a precondition for the launch of institutionalised and co-funded partnerships: alternative approaches have resulted in severe reporting lags and considerable administrative burden. The monitoring of in-kind contributions to partnerships – both to operational activities and as additional activities – could be improved. This would enable an assessment of whether these are already ongoing activities or planned activities of the partners and whether they create additional value, such as increased qualified employment or investment in upgrading production systems and deploying solutions. Moreover, the full list of members should be published and kept up to date by JUs and co-programmed partnerships, enabling an independent assessment of the extent to which partners are meeting their legal obligations on contributions to research activities.

The **partnerships' leverage effect** could increase if private investments were incentivised within the framework of existing partnerships in favour of concrete steps towards deployment. This could be done by using lower funding rates, which would, for example, ensure that more private funding would be put into demonstrator projects. However, expectations for leverage concern the phase after the projects are funded, the use of private investments for deployment, and other

closely related activities (such as skills and the development of standards). This follow-up phase cannot be monitored adequately at present: due to confidentiality concerns, little is known about the extent of these additional activities, which are not necessarily linked to the funded projects. Micro-level data should be collected on the contribution of Member States and international organisations to JUs and co-funded partnerships, especially the extent to which this contribution originates from shared management EU programmes, such as cohesion funds and the RRF.

EU Missions were designed as an impact-oriented new instrument in the programme's policy mix. The Horizon Europe Regulation called for the Missions to 'be targeted, measurable and time-bound and have a clear budgetary envelope' and 'impact-driven, but [have] realistic goals and on research, development and innovation activities'. Due to the monitoring framework shortcomings, it has been challenging for this evaluation to draw conclusions on Missions' progress towards their goals and the extent to which their goals were realistic in the relative short time available for implementation (2021-2030) and given their budgetary allocation (10% of the clusters' budget).

To prepare for the Horizon Europe final evaluation, all Missions could finalise their monitoring and evaluation frameworks, building on the drafts available in the implementation plans.

- Mission Cancer: explain which workstreams count to meeting the goal of 3 million people whose lives have been improved and how these will be reported and aggregated, while minimising any risk of double counting.
- Mission Ocean and Waters: progress on the assessment of the outcomes and impacts of Mission activities (notably Horizon Europe-funded projects) with respect to the Mission specific objectives and targets, as well as considering evolving policy priorities (Ocean Pact, Water Resilience Strategy).
- Mission Soil: the transition to healthy soils by 2030 should be assessed using the indicators monitored in the EU Soil Observatory Dashboard – across the whole EU territory and in the specific areas where the Mission is more active. The Mission should also draw up an approach for monitoring the contribution of its living labs and lighthouses to soil health changes.
- Mission on Climate Adaptation: publish an operational definition of 'climate resilient' regions, providing guidance on what is a climate-resilient region together with a report that can monitor progress to the Mission's goal. The Mission should also identify indicators that will enable the monitoring and aggregation of the key changes that we expect will be observed in these cities (i.e. a reduction of CO2 emissions and other effects).
- Mission Cities: define how and when the assessment of cities carrying the Mission label is conducted and where the number and list of Climate-Neutral and Smart Cities will be published.

Data on funding leveraged by EU Missions was not available for this evaluation. In the future, the Missions could jointly agree on the methodology for monitoring the 'mobilisation of the resources and leverage of additional public and private funds required to deliver their outcome', which is set out in the Horizon Europe Regulation. This could focus on resources and funds that would not have been invested in the set goals without the EU Mission, in order to assess their added value in the final evaluation.

In the field of **efficiency**, the evaluation confirms the finding of the *ex post* evaluation of Horizon 2020 that there is a potential for efficiency savings through reducing the effort and costs of applicants, as a large majority of applicants are unsuccessful.

The *ex post* evaluation of Horizon 2020 identified **dissemination and exploitation** as an area for improvement and it continues to be a challenge. The new Horizon Results Booster was launched in November 2024 to increase exploitation of Horizon Europe projects, including

through matchmaking events with potential investors. Its effectiveness should be monitored in the second half of Horizon Europe and assessed in the final programme evaluation. In particular, the IPR results of Horizon Europe projects will be monitored through the Key Impact Pathways during implementation and evaluated in the ex post evaluation of the programme.

At this stage, the lack of data on the deployment and uptake of Horizon Europe-funded R&I hampers the analysis. In relation to dissemination, exploitation and deployment, **stronger synergies** were also recognised as an important mechanism in the *ex post* evaluation of Horizon 2020. Despite specific efforts to create synergies and guide beneficiaries among the different EU programmes, this report indicates that the funding landscape is too complex. Member States could consider voluntary reporting on their funding of proposals that have been awarded a Seal of Excellence.

In **international cooperation**, multilateral activities should be further pursued with programme-level cooperation (e.g. International Rare Diseases Research Consortium, Global Research Collaboration on Infectious Diseases Preparedness for coordinating international sectoral policy development and implementation, as well as to create greater scale. Efforts could be targeted at specific countries (world leaders) and associated with stronger incentives for third-country participation (e.g. simplified rules, specific funding rates).

As recommended in the final evaluation of Horizon 2020, continued attention is needed to **support women in research and innovation**. This report notes that some improvements are visible, but gender balance has not yet been achieved. The effectiveness of gender equality plans (GEPs) could be further supported by facilitating development of compliance plans, and by strengthening enforcement by means of *ex ante* verification and regular *ex post* compliance checks.

Regarding integration of **SSH**, this could be assessed in more depth, in preparation for the final evaluation of Horizon Europe so as to identify root causes of limited integration in some cases and potential solutions. Moreover, certain actions could already be implemented, such as giving more visibility to the Net4Society NCP project[547] that supports SSH integration across Horizon Europe. The project does this by organising brokerages, trainings for NCPs, and highlighting SSH research funding opportunities beyond flagged topics in Horizon Europe.

Regarding **simplification**, the evaluation recommends to pilot changes to the programme implementation through the use of small but well-designed policy experiments, that follow best practice (e.g. use randomisation to set up a treatment and control group) and are accompanied by careful monitoring and analysis. These pilots can generate a robust evidence base that can then underpin decisions on simplification measures for the wider programme.

[547] https://horizoneuropencpportal.eu/cluster-2