

# The EU's global approach to research and innovation

## SUMMARY

The magnitude of current global challenges, such as the climate crisis and the COVID-19 pandemic, stresses the relevance of joining forces worldwide and pooling human and financial resources to facilitate the creation and dissemination of knowledge and innovative solutions for EU research.

In 2021, the European Commission adopted a communication on a global approach to research and innovation – the new European strategy for international cooperation. In 2022, the European Parliament and the EU Member States responded to the communication with respectively a resolution and a declaration tabled by the Council presidency. Acknowledging the effects of the current geopolitical tensions, including the Russian invasion of Ukraine, they outlined how to ensure that Europe's openness to the world will safeguard EU strategic autonomy, interests and values.

Following the launch of Horizon Europe in 2021, the EU is expected to intensify international cooperation, including by extending association to the programme to new partners such as Australia, Canada, Japan, Singapore and New Zealand.

The participation of stakeholders in international cooperation activities is key to Europe's capacity to expand its scientific and technological leadership – thus far established in the domain of joint exploratory scientific activities, including transdisciplinary initiatives – to also cover technological development and standardisation. European research and innovation players are unambiguously supporting international cooperation for global goods, such as knowledge, the environment and global health. They also express hopes that the United Kingdom will swiftly join Horizon Europe as an associated country.

The first data available on non-EU-based legal entities' participation in Horizon Europe confirm a significant improvement: as of 21 February 2023, they take part in 42.17 % of the 5 200 grant agreements that have been signed since the programme was launched in 2021.

*This updates a briefing published in June 2022.*



### IN THIS BRIEFING

- Introduction
- Growing relevance of international cooperation in EU R&I
- Global approach to R&I: Intensifying cooperation
- International cooperation as an element of a holistic approach
- European Parliament and stakeholder positions



## Introduction

According to a 2021 [recommendation](#) by the Organisation for Economic Co-operation and Development (OECD), international cooperation in science and technology qualifies as bilateral and multilateral cooperation to advance knowledge through basic and applied research, with the involvement of a wide range of research and innovation (R&I) players as well as governments. International cooperation lies at the intersection between science, technology, foreign policy and the international dimension of public policies.

International cooperation in science has grown in importance due, among other things, to global challenges, such as climate change and the COVID-19 pandemic, but also to geopolitical tensions across the world. The political relevance of international cooperation in EU research and innovation is an opportunity for the EU to keep its role as a global powerhouse for science, deliver solutions for EU citizens and beyond, harness the digital and green transitions, and ensure EU strategic autonomy.

Following the adoption of Horizon Europe – the EU framework programme for research and innovation between 2021 and 2027 – the European Parliament, the Council of the EU and the European Commission launched converging initiatives to harness international cooperation in research and innovation as a way to support EU scientific leadership, and EU sustainable competitiveness and open strategic autonomy.

## Growing relevance of international cooperation in EU R&I

### International cooperation in science and technology

International cooperation is understood to be a relevant [feature](#) of modern and contemporary scientific and technological activities. In recent decades, technological drivers (such as digitalisation) and emerging policy priorities (such as climate change) have extended the scope of international cooperation in science and technology. Both the 2021 UNESCO science [report](#)<sup>1</sup> and scientific [literature](#) suggest that there has been a steady growth in international cooperation across several scientific fields since the 1990s, which has been driven by an increase in the number of both participating countries and individuals.

There are two types of international cooperation initiatives in science and technology: those aimed at creating, curating and disseminating knowledge as a global public good (diplomacy for science), and those seeking to harness science to support EU foreign policy ([science](#) for diplomacy).

**Knowledge creation** represents the classic rationale for international cooperation in science and technology. It entails a wide range of cooperative activities throughout the process of knowledge creation, curation and dissemination, carried out by public authorities (governments and academic institutions) in bilateral or multilateral settings (e.g. UNESCO). They aim at creating, curating and sharing knowledge and data, including through major scientific equipment (as in the case of CERN). There are also several prominent examples of civil society-led initiatives in the history of European science: for instance, the [Solvay conferences](#), organised in Belgium since 1911, have contributed to the advancement of knowledge in physics and chemistry.<sup>2</sup>

International cooperation in science and technology has increasingly contributed to EU **preparedness for and response to global challenges** such as climate change and the COVID-19 pandemic. According to the 2019 [edition](#) of the United Nations (UN) global sustainable development report, those challenges are characterised by the need to generate factual certainty at global level and to build societal support. In these circumstances, science is able to elaborate and inform underlying facts and interactions, and thereby to help frame evidence-based policies in a systemic way.

Technological and non-technological-innovation can offer solutions. The response to the COVID-19 pandemic illustrated both aspects: EU funded activities supported knowledge [creation](#) through transnational cooperation activities and investment in world-class scientific [infrastructure](#) (third-country legal entities represented 22% of the participants in the 105 COVID-19-specific projects launched under Horizon 2020 in 2020) and data [stewardship](#). In these endeavours, the EU joined forces with international partners, with a €100 million allocation to the Coalition for Epidemic Preparedness Innovations (CEPI) to support the rapid development of COVID-19 vaccines.

Russia's invasion of Ukraine has also reinforced the relevance of international scientific and technological cooperation in **building EU strategic autonomy**. In addition to EU R&I investment, other policy initiatives include relevant opportunities for international cooperation in science and innovation as well. In the 2022 joint [communication](#) on an EU approach to space traffic management, the EU is set to pursue a privileged discussion with the United States (US).

## Openness of Horizon investment: Results and impact

### Horizon 2020 and Horizon Europe, programmes open to the world

Throughout the duration of Horizon 2020, the EU research and innovation framework programme for the 2014-2020 period, participation in programme activities was open to all types of legal entities,<sup>3</sup> while funding was limited mainly to legal entities established in the EU; the 16 associated countries<sup>4</sup> under the conditions set out in Article 7 of [Regulation](#) (EU) 1291/2013 establishing Horizon 2020; and to participants established in a list of more than [100](#) low- and middle-income [countries](#). In addition to the horizontal support to international participation, the Commission and the Member States designed and launched targeted regional research and innovation initiatives with a strong international cooperation dimension.<sup>5</sup>

The impact of international cooperation can be summarised as positive. Non-EU legal entities participated in Horizon 2020 at a [rate](#) of 11.8% of overall participation, signed 27.7% of the grant contracts, and received €6.58 billion in EU contributions (corresponding to 9.7% of the total EU contributions allocated to beneficiaries). Associated countries accounted for the majority of third-country participants, grants signed and EU contributions received; non-associated countries constituted only 4% of participants and 98% of the signed grants. Only €0.52 billion of EU contributions was granted to those legal entities. Overall, the [US](#) was the main participant from among the non-associated countries (with roughly 10% of overall participation in the funded activities, corresponding to an EU contribution of roughly €0.128 billion). By comparison, [African countries](#) accounted for a mere 0.52% of total participants and 1.32% of the signed grants, corresponding to €0.185 billion, with two countries – Kenya and South Africa – accounting for more than 50% of the overall amount).

The difference between the figures for participation and the number of grants is explained by the collaborative nature of EU R&I framework programme activities: a majority of activities require the proposal to be structured around a consortium of at least three entities established in three different Member States and associated countries. The scope of cooperation covers not only the main curiosity-driven schemes of the programme (such as the Marie Skłodowska-Curie actions and the European Research Council) (see Figure 1) but also several societal challenges such as health, energy and the environment. Interestingly, the participation of international partners highlights the relevance of higher education institutions and public research organisations, which constitute the [bulk](#) of third-country participation (54%).

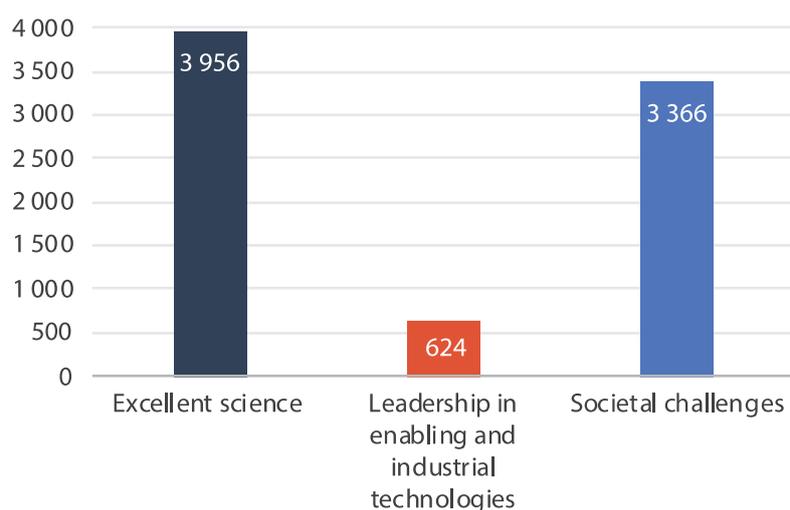
### Openness favours EU scientific leadership and scientific diplomacy

The openness of EU research and innovation policy to the world helps assert the EU's scientific leadership. For instance, the 2021 UNESCO science [report](#)<sup>6</sup> shows that between 2015 and 2019, the progression of the share of international scientific co-authorship increased more rapidly in Europe than in the rest of the world. In 2019, 41.1% of the total scientific European publications were co-

authored with at least one international partner, compared with 41.3% for the US, 23% for China and 23.5% for the rest of the world. Moreover, according to the EU science, research and innovation performance [report](#), the ranking of EU publications among the top 1% and 10% most cited scientific publications has remained unchanged since 2007. Last but not least, through the mandatory implementation of open access to scientific publications created as part of Horizon activities, knowledge can be disseminated across the world. According to a 2021 [report](#) by the Commission, 83% of the scientific publications generated by Horizon 2020 activities are already openly available.

Horizon 2020 has also contributed to socio-economic and policy impacts in line with different regional partners of the EU. In order to facilitate the contribution of research and innovation to EU foreign policy, regional approaches to scientific diplomacy (such as the African Union–European

Figure 1 – Participation by third countries in Horizon 2020 activities



Data source: [Horizon 2020 dashboard](#), data accessed on 6 December 2021.

Union high-level policy [dialogue](#) on science, technology and innovation, the All Atlantic Ocean Research [Alliance](#) and the Arctic Science [Agreement](#)) have been harnessed to facilitate the coordination of joint activities through a wide range of instruments, such as roadmaps and joint calls.

Scientific breakthroughs achieved under Horizon 2020 have also strengthened the international role of the EU (science for diplomacy). Two noteworthy examples include the development of a [vaccine](#) against Ebola and the contribution of the EU

research and innovation programme to the evidence underpinning the proceedings of the intergovernmental panel on climate change. According to a 2022 [study](#) by the European Commission, 12% of the scientific papers referenced in one of the reports of the International Panel on Climate Change (IPCC) sixth assessment report have been funded under Horizon 2020 or its predecessor, the 7th EU research and innovation framework programme, making the EU R&I programmes the second largest funding source of the scientific references mentioned in this IPCC assessment.

## Global approach to R&I: Intensifying cooperation

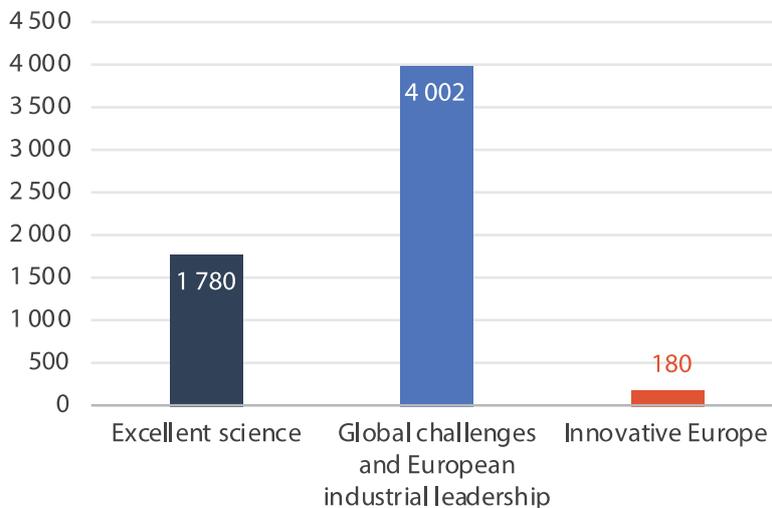
### Horizon Europe: Opening further, safeguarding EU interests

During the preparation and adoption of Horizon Europe, international cooperation gained a lot of prominence. This was done in the [awareness](#)<sup>7</sup> of the massive research and innovation efforts needed to address the global environmental crisis, to work on the United Nations 2030 [agenda](#) on sustainable development, to assuage the geopolitical tensions, and to address the [consequences](#) of Brexit on science. All these issues have highlighted the importance of keeping the EU open to the world, maintaining its leadership as a scientific powerhouse, and feeding its transition to sustainability with breakthrough knowledge and solutions. Under Horizon Europe, the legal provisions on international cooperation aim to intensify the involvement of international partners

and increase the number of associated countries, while safeguarding EU interests. Legal entities established outside the EU continue to be generally eligible for participation in the programme. Article 22(1) of the Horizon Europe Regulation stipulates that 'any legal entity, regardless of its place of establishment and including legal entities from non-associated third countries or international organisations, may participate in actions under the Programme'. As for eligibility for funding, Article 23 of the Horizon Europe Regulation has kept the provisions applicable to Horizon 2020: legal entities established in a non-associated country are not eligible for EU funding unless they belong to the list of [low- and middle-income countries](#) drawn up by the World Bank and mirrored in the [general annexes](#) to the Horizon Europe work programme, or unless their contribution to the project is deemed essential by the independent evaluators.

As of 15 January 2023, Horizon Europe already features 16 [associated](#) third countries;<sup>8</sup> three additional association agreements<sup>9</sup> are expected soon to produce legal effects. This includes the agreement with New Zealand, after the Commission concluded [negotiations](#) with the country in December 2022, paving the way for signing the association agreement in 2023. Moreover, [discussions](#) with democracies beyond the European Neighbourhood countries, in line with Article 16(1)(d)<sup>10</sup> of the Horizon Europe Regulation, are progressing: formal negotiations have

Figure 2 - Participation of third-country legal entities in Horizon Europe (scientific fields)



Source: [Horizon 2020 dashboard](#), data as of 21 February 2023.

started with Canada, while exploratory discussions are being held with Australia, Japan and Singapore. As of that same date, [Switzerland](#) was still not associated to Horizon Europe. As of 21 February 2023, participation of legal entities established in third countries in Horizon Europe activities shows promising first trends. More than 40% of the signed grants include at least one international partner. Among those participants, Horizon is also attracting private companies, which are involved in 16.2% of the signed grants.

#### Brexit and EU research and innovation policy: The case of Horizon Europe

The Trade and Cooperation [Agreement](#) between the EU and the United Kingdom (UK) signed on 24 December 2020 represents a harbinger of this new approach. Article 6 of the [draft protocol I](#) (programmes and activities to which the UK participates) reads: 'The United Kingdom and United Kingdom entities shall not participate in the European Innovation Council (EIC) Fund established under Horizon Europe. The EIC Fund is the financial instrument which is the part of the EIC Accelerator of Horizon Europe that provides investment through equity or other repayable form'. According to the [minutes](#) of the first meeting of the specialised committee on participation in EU programmes, held on 21 December 2021,<sup>11</sup> 'the EU highlighted that for the largest programmes, Horizon Europe and Euratom R&T, there were transitional arrangements in place allowing participants to submit applications and be evaluated as if the UK were associated'. The participation of UK legal entities is receding across the programme: as of 21 February 2023, it represents less than 4.75% of current overall [participations](#) in Horizon Europe.<sup>12</sup>

The increased opportunities for international cooperation are balanced with safeguards to ensure that the EU retains its scientific and technological edge through the investment it makes in research

and innovation. Article 22(5) of the Horizon Europe Regulation opens the possibility of restricting the participation of third-country legal entities in actions related to EU strategic assets, interests, autonomy or security. In addition, Article 40 of the regulation allows the Commission to object to transfers of ownership of results, or to grant of an exclusive licence regarding results, if: a) the beneficiaries that generated the results received EU funding; b) the transfer or licensing is to a legal entity established in a non-associated third country; and c) the transfer or licensing is not in line with EU interests. In the main part of the 2023-2024 Horizon work programme, the [cluster](#) 'digital, industry and space' activates Articles 22(5) for 13 topics, corresponding to roughly 7% of the total budget, on targeted fields such as quantum and space technologies. Moreover, across almost all of the six [clusters](#) of Horizon Europe's second pillar ('global challenges and European industrial competitiveness'), legal entities established in China are no longer eligible for the activities closest to the market ('innovation [actions](#)').

### International openness of US federal research and innovation programmes

In 2020, the US federal [appropriations](#) allocated to foreign persons participating in 28 federal US R&I programmes amounted to the equivalent of €0.477 billion. Whereas this absolute amount is significantly higher than investments in Horizon, the gap is also due to the different institutional set-up for research policies in the EU and the US (see below). However, two relevant lessons can be drawn. First, 79% of the federal appropriations allocated to non-US persons are covered by the Department of Defense and the Department of Health. This trend is in contrast with the respective trends in Horizon 2020, where EU funding extended to third-country entities is mostly covered by their participation in fully bottom-up initiatives such as the European Research Council and the Marie Skłodowska-Curie actions. Second, the share of spending allocated to non-US persons is low (approximately 0.6%). This result might indicate the existence of complementary funding streams for non-US participants, such as the Fulbright [programme](#).

Another comparison relates to the methodological choices made by the US legislator to modulate the eligibility of foreign entities to participate and access funding. Section 2101 under Title I (NSF Technology and Innovation) of the amended version of the [bill](#) stipulates: 'An Act to provide for a coordinated Federal research initiative to ensure continued United States leadership in engineering biology'. This shows that instead of adapting a principle of openness to specific situations, the US legislator prefers to opt for including third countries, to which it wants to grant eligibility to participate and get funding.

## EU institutions' convergence on a global approach to R&I

Following the entry into force of Horizon Europe, in May 2021 the Commission adopted a [communication](#) on the global approach to research and innovation, which sets out the EU strategy for international cooperation. It is grounded not only in the political priorities of Commission President Ursula von der Leyen, particularly the twin digital and green transitions but also the Global Compass, as well as the lessons learnt from the COVID-19 pandemic. It sets three main priorities for cooperation: a) pushing the frontiers of knowledge for sustainability and global public goods; b) harnessing cooperation to promote EU values and open strategic autonomy; and c) teaming the EU's and the Member States' approaches to cooperation. The communication was followed by a statement by the Council of the EU in March 2022 ([declaration](#) of Marseille on international cooperation in research and innovation), and by a European Parliament [resolution](#) of April 2022 on a global approach to research and innovation.

### Pushing the frontiers of knowledge for sustainability and global public goods

The three institutions concur on the two main grounds for pursuing an intensification of international cooperation. On one hand, it is a driver for achieving the objectives set by Article [179](#) TFEU concerning EU research and innovation policies: advancing the EU's scientific and technological bases while permitting free cooperation across borders. Interestingly, the Council declaration stresses the role of research excellence as a principle enabling the relevance of research and innovation outcomes. Parliament's resolution further points out that international cooperation is a lever for enhancing Europe's attractiveness, as well as for supporting continuous investments in

researchers' skills and careers, including brain circulation. On the other hand, the three institutions consider that, beyond supporting knowledge creation and dissemination, international cooperation can contribute to delivering on global public goods in addition to knowledge, such as climate, biodiversity and global health. They support the dissemination of knowledge and solutions to accelerate the transitions, not least through open access to scientific publications. The European Parliament mentions in particular more targeted fields for cooperation such as raw materials.

## Harnessing cooperation to promote EU values and open strategic autonomy

In 2020, the Ministerial Conference on the European Research Area adopted the Bonn [declaration](#) on freedom of scientific research.<sup>13</sup> It affirms the central role of scientific freedom as a common core value and principle for research cooperation with international partners. Beyond academic freedom, the three institutions highlight the need for international cooperation to contribute to gender equality, and to ensure a human-centric approach to technological development. The corollary of promoting academic freedom is the possibility to modulate the scope for cooperation based on the level of compliance maintained by the EU's international partners. As an effective principle to balance international cooperation with strategic autonomy, the three institutions highlight reciprocity as a tool offering the possibility to adapt the EU's bilateral relationships. This reciprocity entails not only compliance with EU values but also the possibility for EU research and innovation players to participate in relevant research and innovation activities, particularly in the associated countries. Any limitation to the eligibility of the legal entities established in a third country would be exceptional, in agreement with Member States and in full respect of the EU's commitments under bilateral agreements. Under the 2021-2022 Horizon work programme, fewer than 20 calls out of more than 1 000 were subjected to this provision.<sup>14</sup> Parliament's above-mentioned resolution calls on the Commission to adopt and publish its approach on this issue.

## Team Europe in research and innovation

Following the launch of the Team Europe [initiative](#) to pool EU and Member State investments to tackle the COVID-19 pandemic, the communication on the global approach calls for combining the actions of the EU, including its financial institutions, and the actions of the Member States, to strengthen the impact of EU research and innovation policy. The relevance of this approach is especially high for EU research and innovation policy: while being a shared competence of the EU and its Member States, it is the former of the two that makes the bulk of investments. In 2020, according to Eurostat, Member States' [spending](#) stood at €311 billion, whereas the appropriations for Horizon 2020's [work programme](#) for the 2018-2020 period were only €30 billion. However, the pooling of resources would benefit not only the EU. In fact, the pooling of Member States' initiatives is also a way to increase the effectiveness and efficiency of their relevant bilateral programmes, not least by enabling critical mass and networking effects. Cooperation between the African Union (AU) and the EU is a promising field for designing and implementing such initiatives. In 2020 a [report](#) by the European Research Area Committee (strategic forum on international cooperation) identified several relevant initiatives of seven Member States (Belgium, Germany, Estonia, France, Austria, Portugal and Finland), together with the streams of EU initiatives. This broad-ranging set of initiatives are mainly oriented towards diplomacy for science, whereas transnational cooperation in education and science is supported through diplomacy initiatives. The [statement](#) adopted at the 6th EU–AU summit – a joint vision for 2030 – refers to the common resolution to support scientific cooperation between researchers to develop knowledge together, as well as sharing technology and expertise, including through a joint AU–EU innovation agenda.

## International cooperation as part of a holistic approach

The growing relevance of societal challenges of a global scale, such as the climate crisis, is giving traction to a transversal approach to research and innovation investment programming. Consistently with the above-mentioned role of science and technology as a lever to sustainability, a holistic government [approach](#) implies that knowledge and creativity are to be harnessed to design

and implement the transformative pathways throughout the relevant policy cycles, including through innovative technological and non-technological solutions. Consequently, the effectiveness of international cooperation depends on its ability to build inclusive governance, and its interplay with other relevant policies aimed at attracting talents and investment, while reining in foreign interference.

## A successful strategy needs an inclusive multi-level governance

So far, the governance of international cooperation in research and innovation policies has been discussed in relation to the respective remit and initiatives of the EU and its Member States, derived from their shared competence set by [Title XIX](#) TFEU. However, there is a need to recognise the roles of a wide range of research and innovation players that contribute to agenda planning, knowledge creation and dissemination. A 2020 OECD policy [paper](#) on addressing societal challenges notes that science has a central role in informing the transformative policies needed to ensure sustainability. This is the case of transdisciplinary research, which draws on knowledge from several scientific fields together with non-scientific knowledge from relevant stakeholders. The paper speaks about a number of different stakeholders: from national governments, international organisations, academic institutions and communities, industry, and civil society (industry, finance and business, non-governmental organisations). Local authorities are also significant stakeholders in such transformative initiatives: as noted in a 2019 OECD policy [paper](#) on decentralised development cooperation, 'almost 60% of SDGs targets can only be achieved by [subnational](#) government'.

Complementary initiatives are being implemented or discussed in order to facilitate the inclusion and the active involvement of all relevant stakeholders mentioned in the paragraph above.

The launch of Horizon Europe [missions](#) conveys the EU's answer to a systemic challenge facing international cooperation, through transdisciplinary research. Based on long-term (10-year) objectives linked to EU sustainability, missions help pool the resources and coordinate the activities and agenda of all the relevant players in charge of creating, disseminating knowledge and solutions. However, in the work programme for 2023, only the missions on beating cancer and restoring EU soils include specific [priorities](#) for international cooperation.

In its 2022 [communication](#) on a European strategy for universities, the Commission notes that Europe's status as the biggest provider of cooperation on higher education is an asset to be leveraged, including through levelling it up across Member States. Since 1971, through the [COST](#) initiative, the EU, the Member States and more than 10 third countries support EU and foreign researchers to build their international research networks. According to the final impact [assessment](#) of COST under Horizon 2020, 92 000 researchers have benefited from its networking tools.

## Associating international cooperation with attractiveness policies

The EU global approach to R&I relies among other things on the EU's capacity to attract the talents and investment needed to compete for scientific and technological leadership along the continuum of research, innovation and education. In its 2022 [communication](#) on attracting skills and talents to the EU, the Commission notes that the EU needs to become more attractive for talent from around the world, notably in comparison with North America and Oceania. The abovementioned trends regarding the participation of third countries in Horizon 2020 are a measure of how attractive the programme is for the EU and the associated countries. The framework programme's curiosity-driven schemes for exploratory research (Marie Skłodowska-Curie actions; European Research Council) seem to enjoy the greatest popularity among the international community. Several Member States have also launched initiatives aimed at attracting international scientists. For instance, the Franco-German joint [initiative](#) 'make our planet great again' supports climate sciences through national calls funding research and training projects both for novice and experienced researchers. More than 50 [projects](#) have been launched under this initiative so far.

Attractiveness can support the global approach beyond science: it can just as well strengthen the EU research and innovation ecosystems' ability to disseminate and take up knowledge and solutions. In its 2022 [communication](#) on an EU strategy on standardisation, the Commission notes that the EU's capacity to frame international standards is essential not only to its ambition for establishing a resilient, green and digital economy but also to its technological sovereignty. It considers that Member States, European standardisation organisations, national standardisation bodies, industry, civil society and academia need to coordinate their efforts to ensure effective representation of European interests in international standardisation fora. In addition to supporting these coordination efforts, the strategy set out in the communication aims at fostering stronger involvement of researchers, innovators (including small and medium-sized businesses) in standardisation activities. More broadly, EU leadership in the emerging technologies rests with building critical mass for early deployment of such green and digital technologies.

Ensuring the EU's interests in the context of international cooperation is an ongoing task. Since 2019, the EU has adopted or implemented different initiatives, including legislative ones, to enhance the framework conditions and the skills of research and innovation players for the avoidance of misuse of EU technology and for curbing foreign interference with research and innovation ecosystems and institutions. As regards legislation, the adoption of [Regulation](#) 2019/452 (EU) establishing a framework for the screening of foreign direct investment into the Union gave the Commission specific prerogatives as of 2019. Whenever the Commission considers that foreign direct investment designated for projects or programmes of EU interest (including Horizon) is likely to affect public security or public order, it may issue an opinion addressed to the Member State in which the foreign direct investment is planned to be made or has been made.

With [Regulation](#) (EU) 2021/821 on setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items, the co-legislators reflect the challenges faced by academic and research institutions stemming from their general commitment to free exchange of ideas, the fact that their research work often involves cutting-edge technologies, their organisational structure and the international nature of their scientific exchanges. The co-legislators invite Member States and the Commission, where necessary, to raise awareness among the academic and research community and provide them with tailored guidance to address those distinct challenges. In 2022, the Commission adopted a staff working [document](#) on tackling R&I foreign interference. Defining foreign interference as a hybrid threat involving entities supporting and/or acting on behalf of foreign countries all along the range of research and innovation activities, it recalls the importance of cooperation beyond borders for science and technology. It also offers academic institutions (public research organisations and higher education institutions) a toolkit to mitigate the risks associated with their international exposure. In 2022, the US National Science and Technology Council issued similar [guidance](#) to the federal departments and agencies to strengthen the protection of US government-supported research and development against foreign government interference and exploitation, while maintaining an open environment to foster research discoveries and innovation that benefit the US and the rest of the world. Interestingly, its scope is larger than the Commission guidance mentioned above: for instance, unlike the Commission document, it makes recommendations to the federal agencies on how to mitigate the risk of foreign interference during the programming and evaluation of their calls for funding.

## The future of science in Ukraine

Since 2013, the trends in Ukraine's international partnerships in science have been shifting. In 2020, the publications co-authored with Polish partners rank first, while the share of Russian<sup>15</sup> co-authored publications has been losing ground since 2015.

On 9 June 2022, Ukraine's [association](#) to Horizon Europe and to the Euratom training programme entered into force (2021-2027). Since Ukraine's association to Horizon 2020 in 2016, Ukrainian participants have taken part in more than 230 projects, corresponding to an EU contribution worth € 52.4 million.

Russia's war is causing significant human and material [damage](#) to Ukraine researchers, students, research infrastructure and institutions. According to an OECD [brief](#) on the future of Science in Ukraine, up to a quarter of the country's researchers might have been forced to leave the country in 2022.

The Commission created the [ERA4Ukraine](#) website, which is a one-stop shop for information and support services to Ukraine-based researchers and researchers fleeing Ukraine. The portal brings together information on initiatives at the EU level, by country and by non-governmental groups.

As for the Member States, several research and innovation liaison offices (Czechia, Estonia, Latvia, Hungary, Poland, Slovenia, Slovakia and Finland) adopted a joint [statement](#) in token of their commitment to working with their European partners and stakeholders to develop and implement meaningful measures such as research and mobility funding instruments, administrative care, training and other support measures. They also refer to transnational academic initiatives, such as [#ScienceForUkraine](#), and the initiative [nep4dissent.eu](#), a COST action funded by Horizon 2020.

## European Parliament and stakeholder positions

This section complements a 2021 EPRS [briefing](#) analysing national, regional and local positions on the global approach to research and innovation.

### Parliament's position

The European Parliament adopted a [resolution](#) on 8 April 2022 on a global approach to research and innovation. In addition to the elements presented above, this resolution supports the openness of EU research and innovation. More specifically, taking note of the new framework for association, it calls on the Council and the Commission to enter into an interinstitutional agreement with the Parliament in order to give it a stronger role in the management of association agreements signed under Article 16(1)(d) of the Horizon Europe Regulation. It also calls on the governments of Switzerland and the UK, on the one hand, and the Commission, on the other, to re-establish constructive relations as a basis for closer cooperation and potential association to Horizon Europe. Regarding the Russian war on Ukraine, it calls on the Commission to develop, in cooperation with the Ukrainian government, calls for projects in Horizon Europe dedicated to strengthening the Ukrainian scientific sector as well as boosting cooperation between the EU and Ukraine.

Parliament has also mentioned international cooperation on research on other occasions: for instance, in its [resolution](#) of 20 May 2021 on accelerating progress and tackling inequalities towards ending AIDS as a public health threat by 2030, it urges the EU to offer support to developing countries, particularly the least developed ones, in the effective implementation of flexibilities provided for in the Trade-Related Aspects of Intellectual Property [Agreement](#) (TRIPS) for the protection of public health, notably on compulsory licensing and parallel import, and to optimise the use of voluntary licensing and technology sharing to meet public health objectives.

### Stakeholder positions

On the short term, the two main views supported by research and innovation stakeholders relate to their support to their Ukrainian counterparts (as referred to [above](#)), as well as their preference for swift finalisation of the association of the UK to Horizon Europe, and a rapid association of Switzerland as well. On this last point, in April 2022 a joint [statement](#) by CNR, CNRS, CSIC, Helmholtz

Association, Leibniz Association and Max Planck Society reaffirm their support for the association of Switzerland and the UK to Horizon Europe. In particular, they deem this detrimental to scientific cooperation and to the leadership of Europe. On 27 April 2022, the German U15, the Guild of European Research-Intensive Universities and Udice issued a joint [statement](#) on international cooperation, reflecting the views of the universities belonging to these networks. Six main messages are conveyed on the importance of international cooperation: i) it is essential for the progress of science and benefits humanity as a whole; ii) it is a major diplomatic tool; iii) research universities are willing to help prevent risks; iv) EU programmes in favour of academic and scientific cooperation must contribute to making Europe a more attractive territory, open to cooperation with the rest of the world; v) research universities are one of the pillars of European development and technological sovereignty; and vi) international collaboration in research and higher education is essential for achieving the UN Agenda 2030. On the question of deploying a Team Europe approach to support the EU global approach to R&I, on 16 February 2022, several European development and finance institutions adopted a [statement](#) to pool and step up their support to the investments for education and research in Africa. On the question of deploying a Team Europe approach to support the EU global approach to R&I, on 16 February 2022, several European development and finance institutions adopted a [statement](#) to pool and step up their support for investment in education and research in Africa.

Regarding the topic of international cooperation for innovation, on 3 May 2022, Business Europe issued a [statement](#) in view of the second ministerial of the EU–US Trade and Technology Council. As for the emerging technologies, it suggests to avoid divergent regulatory approaches. It also considers that the US and EU should support joint research collaboration efforts within areas such as 6G, AI, semiconductors, and advanced manufacturing with adherence to World Trade Organization technical barriers to trade [principles](#) for international standards development.

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## ENDNOTES

- <sup>1</sup> See Figure 1.4 – International scientific co-authorship, by region and selected country, 2015 and 2019, p. 36.
- <sup>2</sup> In a [contribution](#) to the 12th Solvay conference in 1961, Niels Bohr predicted that 'the careful recording ... of these meetings will in the future be a most valuable source of information for students of the history of science wishing to gain an impression of the grappling with the new problems raised in the beginning of our century'.
- <sup>3</sup> With restrictions set accordingly in the relevant financing decisions (such as work programmes).
- <sup>4</sup> Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, North Macedonia, Moldova, Montenegro, Norway, Serbia, Switzerland, Tunisia, Türkiye and Ukraine.
- <sup>5</sup> This is notably the case of [PRIMA](#), a partnership for a 10-year research and innovation programme in the Mediterranean area initiated under Article 185 TFEU (which authorises the EU to contribute to a research and innovation programme on water, agriculture and land) and, launched by 11 Member States (Germany, Greece, Spain, France, Croatia, Italy, Cyprus, Luxembourg, Malta, Portugal and Slovenia) and eight Mediterranean non-EU countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Tunisia and Türkiye).
- <sup>6</sup> Figure 1-4, p. 36.

- <sup>7</sup> According to the methodological approach applied by the United Nations in preparing the editions of the global sustainable development [report](#), science and technology, together with governance, economy and finance, individual and collective action are the four levers that enable transformative policies.
- <sup>8</sup> Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, North Macedonia, Norway, Serbia, Tunisia, Türkiye and Ukraine.
- <sup>9</sup> Morocco, New Zealand and the United Kingdom.
- <sup>10</sup> [Article](#) 16(1)(d) of the Horizon Europe Regulation allows for an additional ground for associating any third country that would comply with three sets of additional criteria: (i) a good capacity in science, technology and innovation; (ii) commitment to a rules-based open market economy, including fair and equitable dealing with intellectual property rights, respect of human rights, backed by democratic institutions; (iii) active promotion of policies to improve the economic and social well-being of citizens. Under this scheme, the scope of the association would take into account an analysis of the benefits for the Union and the objective of driving economic growth in the Union through innovation. In other words, parts of the programme may be excluded from an association agreement.
- <sup>11</sup> As of 21 February 2023, the minutes of the second [meeting](#) held on 21 September 2022 were not yet published.
- <sup>12</sup> To support further participation by UK legal entities, the UK government commits to providing a funding [guarantee](#) to such entities that would successfully pass the evaluation of Horizon Europe calls for funding with a deadline by 31 March 2023.
- <sup>13</sup> [Article](#) 13 of the Charter of Fundamental Rights of the EU stipulates that 'the arts and scientific research shall be free of constraint. Academic freedom shall be respected'.
- <sup>14</sup> 21 topics include the activation of one or several of the limitations provided for in the above mentioned Article 22(5) of the Horizon Europe Regulation. Under the Horizon Europe [work programme](#) 2021-2022, they are all found under Horizon Europe's Cluster 4 – Digital, industry and space, and entail only certain activities related to space, or to quantum.
- <sup>15</sup> On 3 March 2022, the Commission [suspended](#) cooperation with Russian entities in research, science and innovation. Following the adoption of the fifth package of sanctions against Russia on April 2022, the [participation](#) of all Russian public bodies or related public entities in ongoing Horizon 2020 projects will be terminated. Furthermore, no new contracts will be signed with these entities under Horizon Europe. EU researchers accounted overall for more than 50 % of internationally co-authored Russian scientific [publications](#). The impact on Russian scientific and technology capacity is expected to be [significant](#).

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