Wilfried
Martens Centre
for European Studies

Horizon: Competitiveness

How FP10 Can Unlock Europe's Collective Intelligence for Science, Competitiveness and Strategic Autonomy

Craig Willy

Summary

October 2025

This policy brief offers a centre–right vision for the future of European research and innovation (R&I) policy under the next Framework Programme (FP10). In an era marked by rapid technological disruption and geopolitical volatility, the EU must mobilise its scientific talent and R&I capabilities to achieve competitiveness and strategic autonomy. The brief outlines a decentralised, market-based and geopolitical approach to R&I.

The recommendations aim to unleash the collective intelligence of the EU's rich and diverse R&I landscape by empowering researchers, businesses and civil society through trust, streamlined governance, and enabling conditions. Key recommendations include maintaining Horizon as a standalone excellence-focused programme, embracing innovation across all policies, and building shared platforms for key enabling technologies, such as AI, biotech and semiconductors.

The brief also calls for robust standardisation to unify markets and maximise the 'Brussels Effect', targeted brain-gain strategies to attract global talent, and nuanced dual-use R&I policies to strengthen Europe's defence and resilience. Finally, it urges investment in ethics and foresight activities to imagine realistic scenarios and policy options for a human-centric future amid transformative technological change. By avoiding overprescriptive central planning and enabling emergent creativity, FP10 can help Europe become a scientific and economic powerhouse capable of safeguarding freedom, prosperity and sustainability in the twenty-first century.

Keywords EU competitiveness – Research and innovation – Framework Programme

Introduction

Knowledge is power, as the old saying goes. The statement is especially true in science and innovation. Scientific knowledge, deployed socially in the form of technologies and economically valued applications, has been a preeminent source of power for nations in the modern world. The successful development and deployment of scientific knowledge multiply nations' technological, societal, economic and ultimately geopolitical capabilities. Societies lacking in techno-scientific capabilities tend to become dependent on more innovative powers.

The research and innovation (R&I) policy of the EU is at a pivotal moment as the EU considers the future of the Horizon Europe research programme beyond 2027. On the one hand, the EU remains one of the world's three great poles of scientific research, alongside the US and China.[1] As of 2022, the EU produced over 19% of the world's top 10% of the most-cited scientific publications, on a par with the US.[2] On the other hand, there are long-standing worries that the EU has been unable to sufficiently translate this scientific prowess into real-world companies and cutting-edge technological applications at scale.

While the EU's technological and economic underperformance may have been tolerable in periods of peace and stability, it is leading to severe vulnerability in our era of unprecedented geopolitical instability. As former European Central Bank president Mario Draghi noted when presenting his celebrated report on competitiveness,[3] of all the major economies, the EU is the most vulnerable to such instability. It is highly dependent on imported critical raw materials, imports 80% of its digital technology, relies heavily on imported energy and can claim only 4 of the world's top 50 tech companies as European. This translates into concrete dependence on American technology and space companies; Russian energy; and Chinese-made telecommunications equipment, electronics and medicines.

1 While there is no doubt China is a leading scientific power in the world today, there are concerns that common metrics of scientific output may be overstating its performance due to that country's excessive self-citation, citation cartels, scientific paper mills and fraudulent research. See D. Normile, 'China's Scientists Often Cite Work From Their Own Nation. Is That Skewing Global Research Rankings?' *Science* (2024); L. Shi et al., 'Mapping Retracted Articles and Exploring Regional Differences in China, 2012–2023', *PLOS One* 19/12 (2024), Article e0314622; H. Else and R. Van Noorden, 'The Fight Against Fake-Paper Factories That Churn Out Sham Science', *Nature* 591/7851 (2021), 516–19.

2 European Commission, Directorate-General for Scientific Research and Innovation, 'Scientific Knowledge Production', in European Commission, Directorate-General for Research and Innovation, *Science, Research and Innovation Performance of the EU 2024 Report* (Brussels, 2024), 169.

3 M. Draghi, *The Future of European Competitiveness—A Competitiveness Strategy for Europe* (Brussels, 9 September 2024).

The EU needs, among other things, to mobilise science to regain its economic competitiveness and strategic autonomy, especially in high-tech fields. This is not about selfish materialism or the mindless pursuit of GDP growth as an end in itself. Rather, groundbreaking R&I and economic competitiveness are the *sine qua non* for Europeans' collective capabilities and sovereignty in general. Due to costly welfare systems and an ageing population, R&I and competitiveness are key to the EU's socio-economic sustainability. Developing technological capabilities is equally needed to tackle environmental, health and other challenges, as well as to defend European values and interests in the world.

It has long been recognised that fluctuations in economic and techno-scientific capabilities inform long-term geopolitical trends such as national power and sovereignty[4] and the ability to tackle global challenges. As Draghi said when presenting his report, 'My concern is not that we will suddenly find ourselves poor and subservient to others. . . . It is that, over time, we will inexorably become less prosperous, less equal, less secure and, as a result, less free to choose our destiny.'[5]

Europe was the birthplace of capitalism and the scientific revolution, developments which birthed the modern world and which, despite real injustices, ultimately led to unprecedented expansion in standards of living, life expectancy and scientific understanding throughout the world. In the years to come, the EU must become a scientific and economic superpower if it is to be a viable geopolitical player and retain the capacity to contribute to global goods, from the fight against climate change to pandemic preparedness. EU R&I programmes are critical to these efforts.

The rise of EU science policy

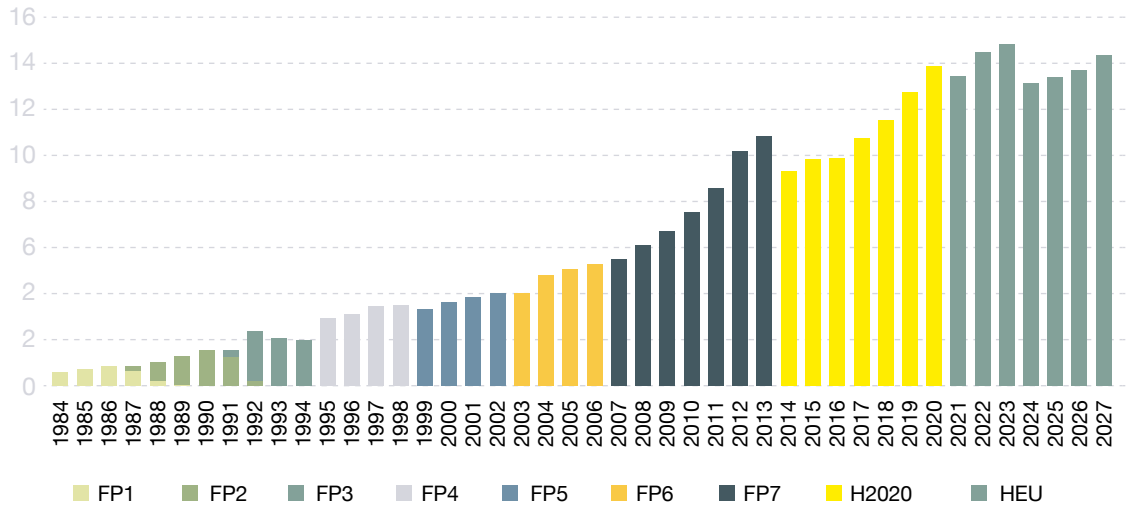
From humble beginnings in the 1980s, EU research spending under the framework programmes has risen prodigiously over the decades. The goal of promoting science was enshrined in 2009 in the Lisbon Treaty, which states that the EU 'shall have the objective of strengthening its scientific and technological bases', including through a European Research Area and framework programmes.

---

4 P. Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987).

5 M. Draghi, 'Presentation of the Report on the Future of European Competitiveness', address by Mr. Draghi to the European Parliament, Strasbourg, 17 September 2024.

Figure 1 Annual budgets of the framework programmes in € billion, at current prices



Source: European Commission.

European science funding has steadily expanded in scale and policy objectives. The European Research Council, established in 2007, has since proven itself to be a prestigious and effective funder of scientific research, with 14 European Research Council grantees having won Nobel Prizes. Horizon 2020, running from 2014 to 2020, was the first EU framework programme to integrate R&I with new support for public–private partnerships and innovative small and medium-sized enterprises.

Horizon Europe, the ninth framework programme, running from 2021 to 2027, is the largest so far with a budget of €93.5 billion, or almost 9% of the EU's multiannual budget. Over time, the programmes' objectives have been broadened to also address societal challenges, foster market-creating innovations and contribute to the EU's objectives in terms of the green transition, the digital transition, resilience and strategic autonomy.

EU-level funding still only accounts for about 10% of public research and development (R&D) spending in the EU despite the broadening of objectives.[6] As the Draghi report notes, spending 'is spread across too many fields'.[7] While this may be understandable given the need for consensus in EU policymaking and the need for programmes to contribute to the EU's various objectives, it also

[6] European Commission, *Implementation of the European Research Area (ERA): Strengthening Europe's Research and Innovation: The ERA's Journey and Future Directions*, COM (2024) 490 final (22 October 2024), 5.

[7] M. Draghi, *Future of European Competitiveness*, Part A, 29.

leads to bureaucratic complexity and the dispersal of efforts. As advised by the Draghi report, Horizon Europe should be laser-focused on excellence, EU-added value and scale.[8]

A centre–right approach to science and innovation

This brief outlines a centre–right approach to fostering science and R&I in the EU. The European People's Party, long-established as the strongest political force in Europe, has always sought to capture a broad range of values important to Europeans. The party has always been a strong supporter of innovation[9] and regulated market-based solutions. At the same time, Europe's centre–right has a long tradition of seeking to put economic and technological capabilities at the service of higher humanistic values such as freedom, human dignity and European solidarity, as well as ecological sustainability.

The relationship between science and policymaking is complex and bidirectional. Policymakers promote science partly to enable the disinterested pursuit of knowledge about our world, but also to yield findings that may be useful to society. Conversely, science can and should also influence policymaking so that decision-makers can take action not based on mere impressions and intuition, but on sound evidence and facts as best we know them.[10]

While recognising public support for R&I as essential, this brief calls for **epistemic humility** regarding the capabilities of policymakers to direct the economy and scientific endeavour. Policymakers must resist the ever-present temptation to engage in central planning and overprescriptive measures. Knowledge of the state of scientific discovery, technological development and their possible socio-economic applications is extraordinarily complex and constantly emerging.

Above all, this knowledge is *dispersed* among the wide range of Europe's remarkable landscape of scientific researchers, businesses and investors, local communities, civil society and other actors. Therefore, the goal of EU R&I policy should be to provide the right support and conditions to **unlock the collective intelligence** of Europe's researchers and innovators.

---

8 Ibid.

9 This is evident in the votes of the European People's Party Members of Parliament (MEPs), who have been by far the strongest supporters of innovation in recent years. See B. Moran, 'Where Do MEPs Really Stand on Innovation Policy?', *Delta V*, 26 March 2025.

10 C. Willy, "Closing the Gap Between Science and Politics: A European View," *Global Policy*, 5 December 2022.

Collective intelligence refers to the general capacity of human groups to solve problems, from individual teams to whole societies.[11] Crucially, a society's constantly changing knowledge, which is needed to solve problems, is dispersed among its members. In the context of R&I, maximising collective intelligence means developing and attracting human capital, competent researchers to investigate the scientific frontier as they best see fit, and creating the enabling conditions so that investors, companies and other innovators can leverage that knowledge to create value for society.

As such, this brief seeks to avoid excessively prescriptive approaches to R&I policy, let alone turning R&I into a branch of industrial policy. Rather, it proposes measures to empower researchers to pursue scientific curiosity in their area of expertise, create and enlarge markets to empower businesses to innovate and deploy solutions at scale, as well as retain and attract great minds and foster collaboration with like-minded partners. The recommendations are made in the belief that enabling the autonomy and collaboration of outstanding researchers and innovators is the key to scientific discovery and to deploying solutions to societal and global challenges.

1. Close the innovation loop

EU science policy alone cannot deliver the innovation which the continent needs. In recent years, there may have been too optimistic expectations of the capacities of government-led efforts to drive innovation and societal change.[12] The progress of scientific knowledge in universities is one thing; leveraging that knowledge to create value—economic, sanitary, environmental or any other kind—depends above all on iteration (at which the market far outperforms governments), decentralised action, and leveraging the dispersed knowledge of the market and civil society.[13]

We should not be under the illusion that increased public R&D spending, whether at the European or other levels, is the sole solution to the EU's falling behind in

[11] A. W. Woolley et al., 'Evidence for a Collective Intelligence Factor in the Performance of Human Groups', *Science*, 330/6004 (2010), 686–88; O. Lehto, *Evolution, Complexity, and Intelligence: The Methodological Foundations of Evolutionary Liberalism*, PhilArchive (2025).

[12] N. Karlson, C. Sandström and K. Wennberg, 'Bureaucrats or Markets in Innovation Policy? A Critique of the Entrepreneurial State,' *The Review of Austrian Economics* 34 (April 22, 2020), 81–95.

[13] N. Elert, M. Henrekson and M. Stenkula, *Institutional Reform for Innovation and Entrepreneurship: An Agenda for Europe* (New York: Springer, 2017).

innovation. It is noteworthy that the nations with the highest R&D spending as a share of GDP—such as the US, the Nordic countries and China—also tend to have a higher share of *private* R&D spending.[14] This suggests that European countries' failure to reach the EU's R&D spending target of 3% of GDP is not simply due to a lack of public spending, but rather to poor market incentives, which discourage private investment. In short, investing in R&D in the EU is currently relatively *unprofitable*, or at least perceived to be as such by investors.

The technological dominance of US and Chinese companies is driven by a combination of supportive government policies—including public support for R&I as well as subsidies, varying degrees of protectionism and other market distortions—and competitive internal market dynamics. This is the case in the areas of tech, AI, biotech and space, among others. The scale of the US and Chinese markets, the availability of private capital, and regulatory and cultural environments favourable to making large-scale and often high-risk investments have enabled practitioners to turn technical know-how into valued products and services. The unpredictable and decentralised process of creative destruction is the key to innovation. A large and growing economy is arguably, in itself, a prerequisite to be able to create well-funded public R&I programmes.

As detailed in the Draghi report,[15] the inability to translate the EU's strong academic research performance into competitiveness stems from a range of issues, of which science policy *stricto sensu* is only one component. The report notes, 'At the root of Europe's weak position in digital tech is a static industrial structure which produces a vicious circle of low investment and low innovation'.[16] Factors hampering private sector investment and economic deployment of technological innovations in the EU may include excessive taxation, market fragmentation, lack of access to capital, expensive energy and raw materials, and excessively precautionary regulation. These obstacles must be eliminated to close the innovation loop in the EU and create the conditions for a virtuous circle of growing private investment in R&D.

---

14 Ibid., 59–60.

15 See M. Draghi, *Future of European Competitiveness*, Part A, Chapter 2, 'Key Barriers to Innovation in Europe', 28–35. See this passage, in particular: 'In 2021, EU companies spent about half as much on R&I as share of GDP as US companies—around €270 billion—a gap driven by much higher investment rates in the US tech sector. . . . Once companies reach the growth stage, they encounter regulatory and jurisdictional hurdles that prevent them from scaling-up into mature, profitable companies in Europe. As a result, many innovative companies end up seeking out financing from US venture capitalists . . . and see expanding in the large US market as a more rewarding option than tackling fragmented EU markets.'

16 Ibid., 28.

Even the best public funding cannot enable innovation unless framework conditions are there to enable private/societal actors to operationalise and deploy technological breakthroughs to provide useful goods and services. The long-standing calls for the EU to embrace more market-based innovation[17] remain relevant. It follows that, in addition to well-funded and well-designed research programmes, the EU and its member states must systematically ensure policies in all areas foster innovation and competitiveness alongside other goals.

Recommendations to close the innovation loop

- Urgently act upon the pro-competitiveness recommendations of the Draghi report. This includes **eliminating barriers within the single market for innovation-intensive sectors** such as data, capital markets, pharmaceuticals and biotech, and defence.

- **Embrace an 'innovation-in-all-policies approach'** by systematically assessing the current and potential impact of policies at all levels in the innovation cycle.

2. Empower researchers: simplify and refocus Horizon Europe

Knowledge about the current state of the scientific frontier and potential breakthroughs is dispersed across the EU's diverse academic and research landscape. The revolutionary discoveries and game-changing applications of tomorrow cannot be predicted or prescribed by policymakers. Rather, Horizon Europe must empower the best science, technology, engineering and mathematics (STEM) researchers to undertake curiosity-driven science.

Curiosity-driven science means researchers can explore the scientific frontier, according to their own expert knowledge of the most interesting potential breakthroughs of a particular field, without being constrained by bureaucratic restrictions or the need for immediate applications. Future discovery depends on science remaining fundamentally open-ended and open-minded. There is no telling what applications an apparently obscure research area may ultimately yield. For example, CRISPR-Cas9 gene editing was co-developed by Emmanuelle Charpentier and Jennifer Doudna, initially based on research regarding the apparently niche

[17] *Science|Business*, 'Think-Tank Calls for Market-Friendly Innovation Policy,' 24 October 2007.

issue of bacterial immune systems. CRISPR is now being applied in fields as diverse as precision health, biofuels, novel foods and mosquito eradication.

Empowering European scientists means letting them focus on research rather than struggling with administration or constraining their work of discovery. Rules for Horizon applicants should be simple, stable and supportive of open-ended research. This also means Horizon should not be subsumed within a broader fund, which would inevitably lead to disruption, complexity and a dilution of the programme's mission. There is indeed a broad consensus among stakeholders that FP10 should remain a standalone framework programme, including among MEPs.[18]

Recommendations to empower scientists

- Maintain Horizon as a standalone programme.
- Support curiosity-driven science being done by the best research teams by **valuing excellence, making calls less prescriptive** for basic research and **simplifying reporting requirements**.
- **Implement a 'trust first, evaluate later'** model to streamline application processes, as recommended by the Heitor Report.[19]
- **Expand the use of lump sum grants** to reduce administrative costs.

3. Unlock key enabling technologies

The development of key enabling technologies (KETs) has a powerful impact on the economic competitiveness and geopolitical capabilities of nations. KETs are technologies with such ramified and disruptive current and potential applications as

[18] E. Francica, 'MEPs' Vote Reinforces Push for a Standalone FP10,' *Science|Business*, 24 April 2025.

[19] European Commission, Directorate-General for Research and Innovation, *Align, Act, Accelerate – Research, Technology and Innovation to Boost European Competitiveness* (2024), 86.

to be critical for EU competitiveness and sovereignty. Lists of KETs vary;[20] however, these should include technologies with cascading effects in terms of applications and further technological development, such as advanced manufacturing, advanced materials, biotechnologies, semiconductors and AI.

In today's geopolitical climate, the EU cannot be dependent on hostile or unreliable states for KETs. The EU's capabilities regarding KETs should preferably be developed through scientific excellence and an environment favourable to innovation rather than protectionism. The EU should not seek strategic autonomy in all economic sectors but, rather, aim to diversify and 'friendshore' dependencies while ensuring full autonomy in the most critical areas.[21] This ensures that the EU and partner economies benefit from the comparative advantages of trade while also safeguarding strategic interests.

Nor should the EU seek to 'pick winners' in particular technological areas. Rather, Horizon support to KETs should focus on pre-competitive research consortia and common platforms that can be used by both businesses and academia. Horizon Europe's Missions concept beyond 2030 should be refocused on KETs, as the development of fundamental technological capabilities is key to driving positive economic, environmental and societal changes. Horizon's activities on KETs must be carefully aligned and avoid duplication with the Commission's broader efforts on KETs, such as the Strategic Technologies for Europe Platform.

Recommendations to unlock KETs

- **Support research infrastructure for KETs**, such as pilot lines, digital and data infrastructure, clean-room fabrication hubs and biofoundries.
- **Refocus post-2030 Missions beyond 2030 on KETs**, prioritising objectives such as achieving EU autonomy on AI, space, critical medicines and dual-use technologies such as drones.

[20] The European Commission's 2012 *Communication on KETs*, still used by the Directorate-General of Research and Innovation, lists micro-/nanoelectronics, nanotechnology, photonics, advanced materials, industrial biotechnology and advanced manufacturing technologies, with AI and broader biotechnologies both lacking. By contrast, a 2021 European Parliament Panel for the Future of Science and Technology study broadens, perhaps overly so, the KETs concept to six clusters: advanced manufacturing, advanced (nano)materials, life-science technologies, micro-/nano-electronics and photonics, AI, and security and connectivity technologies. See European Commission, *A European Strategy for Key Enabling Technologies – A Bridge to Growth and Jobs*, COM (2012) 341 final (26 June 2012), 3; T. Ramahandry et al., *Key Enabling Technologies and Europe's Technological Sovereignty*, European Parliamentary Research Service (Brussels, December 2021).

[21] A. Chryssogelos, *European Sovereignty Between Autonomy and Dependence: A Guide for EU Policy*, Wilfried Martens Centre for European Studies (Brussels, 22 June 2023).

4. Leverage dual-use R&I

In the face of threats from Russian and other sources, as well as the manifest and unfortunate unreliability of the US, the EU must maximise its defence capabilities, including through R&I policies. This is simply a necessity for the EU in the world of today: freedom must be better armed than tyranny.[22] At the same time, rising defence spending—with member states authorised and encouraged to spend an additional €800 billion as part of ReArm Europe/Readiness 2030—will lead to spillover civil applications and potential synergies for civil research, which should be maximally exploited.

The European Commission intends to strengthen the EU's support for dual-use infrastructure and advanced technological capabilities.[23] However, concerning Horizon Europe, the Heitor report rightly notes that distinguishing between purely civilian and dual-use military-civil technologies is virtually impossible. Dual-use applications are 'ubiquitous' in fields as diverse as digital technology, telecommunications, drones and health.[24]

To avoid bureaucratic paralysis, EU research funds should therefore not seek to distinguish dual-use applications in research projects from regular civil research. Nonetheless, the Commission should be able to specify when a research project is sensitive enough to merit restricting the foreign partners European researchers may work with. This should be done on a pragmatic, case-by-case basis.

Recommendations for dual-use R&I

- **Avoid labelling research areas as dual-use within Horizon Europe**, while giving the Commission discretion to limit cooperation with particular countries for sensitive projects.

- Design European Defence Agency projects to **leverage EU and national civil research for defence applications** and design Horizon Europe projects to **leverage increased EU and national defence research for civil applications**.

[22] G. Walshe, *Freedom Must Be Better Armed Than Tyranny: Boosting Research and Industrial Capacity for European Defence*, Wilfried Martens Centre for European Studies (Brussels, November 2023).

[23] European Commission, High Representative of the Union for Foreign Affairs and Security Policy, *European Defence Readiness 2030*, White Paper, JOIN (2025) 120 final (19 March 2025).

[24] European Commission, Directorate-General for Research and Innovation, *Align, Act, Accelerate*, 111.

5. Empower businesses to better reflect market demand

When possible, market-driven solutions are generally more effective than top-down efforts and central planning. To maximally contribute to economic competitiveness and unlock the value of science to society, EU R&I programmes must better reflect actual market demand and industrial and ultimately consumer needs.

Science is of no social utility if the resulting insights languish in the lab. Whatever the role of the public sector in supporting basic science, it tends to be investors, entrepreneurs and businesses that go on to identify, develop and deploy useful applications at scale. To support competitiveness, EU R&I policy must enable industrial–academic collaboration, create enabling conditions for businesses and reflect market demand through mechanisms such as price signals and co-financing.

The EU's dependence in many technological sectors on foreign corporate giants is not an inevitability. The example of Airbus shows how, from humble beginnings and through steady action over the years, European companies can successfully collaborate to challenge and even achieve leadership in a market long dominated by foreign players. EU policy should not look to 'pick winners' by promoting particular companies but should proactively work to create conditions favourable to the rise of such European industrial champions.

The need to better reflect market demand is particularly relevant for research infrastructures and public–private partnerships. Policymakers must proactively ensure such activities are economically useful, including by co-designing projects with industry and other relevant stakeholders, such as academic partners and regional clusters. Horizon Europe can further foster cross-fertilisation between industry and academia in multiple ways. The circulation of knowledge and talent between academia and industry should be promoted by increasing the share of Industrial Fellowships within the Marie Skłodowska-Curie Actions. These should focus especially on KETs.

Recommendations to better reflect market demand

- **Enhance co-financing mechanisms** to ensure private actors have skin in the game.[25]
- **Ensure Research Infrastructures serve both academia and industry**, with modulated fees for services to enable price mechanisms while facilitating access for small and medium-sized enterprises and startups.
- **More proactively solicit industry group input** when designing Horizon activities.
- Within the Marie Skłodowska-Curie Actions, **increase the share of industrial fellowships** and encourage industry placements in key technological sectors.

6. Unify markets through standardisation

Trade barriers, both within the single market and with respect to other countries, have grown more significant as more complex sectors, notably in services, have grown to make up a greater share of the economy. Overcoming resulting non-tariff barriers in various sectors, such as data, telecommunications and medicines, has thereby become a constant struggle. Standardisation is a powerful way to overcome such barriers, enabling researchers and companies to fully benefit from the scale of the EU's single market of 450 million people.

Horizon Europe projects promoting standardisation of norms and processes must contribute to eliminating market barriers both within the EU and with respect to third countries. Where appropriate, standardisation should be embedded in R&I calls, such as through standards impact assessments identifying relevant gaps and standardisation work packages allocating budgets for participation in standardisation bodies such as the European Committee for Standardization, the European Electrotechnical Committee for Standardization and the European

[25] Having 'skin in the game' means a decision-maker has a personal stake in the outcome of a decision. A private individual or company spending their own money has a strong incentive to make careful purchasing and investment decisions. Increasing the share of private spending helps ensure funded projects answer real-world needs and are not the fruit of overly consensual box-ticking exercises. The concept was popularised by writer and statistician Nassim Nicholas Taleb.

Telecommunications Standards Institute. Such bodies have helped not only to define workable standards for operators within the EU, but also to foster aligned global standards. Horizon should also fund standardisation projects preparing or implementing EU legislation, such as the AI Act, the European Health Data Space and the Health Technology Assessment Regulation.

Combining both scale and a transparent and collaborative style of governance, the EU is uniquely placed among world powers to promote its standards and processes internationally. This can result in the 'Brussels Effect', whereby third-country companies and authorities comply with EU standards.[26] Horizon Europe projects should be designed to support third-country regulatory authorities and stakeholders adopting standards and processes compatible with those of the EU. Insofar as nations such as the UK, Türkiye and Japan align with EU standards, these reduce barriers to trade and research collaboration while moving towards the critical mass needed to become *de facto* global standards.

Recommendations for unifying markets through standardisation

- **Embed standardisation in R&I** calls, such as through standards impact assessments and work packages funding participation in standardisation bodies.
- **Maximise the Brussels Effect** by setting standards that can be emulated by third-country actors and, where relevant, make standardisation projects open to third-country participation.

7. Secure multilateralism

The fostering of international cooperation and scientific exchange has been one of the great successes of EU science policy. This is reflected in the dense network of association agreements between the EU and other countries enabling participation in Horizon Europe programmes.[27] In our era of unprecedented geopolitical instability and the return of great-power politics—which is to say

[26] A. Bradford, *The Brussels Effect: How the European Union Rules the World* (Oxford: Oxford University Press, 2019).

[27] European Commission, *List of Participating Countries in Horizon Europe* (20 August 2025).

international lawlessness—the EU has the potential to become **the lynchpin of the world's rules-based scientific powers**.

Many small or middle powers are at the cutting-edge of science and have a common interest in securing a rules-based international order in which the security of each is not beholden to the arbitrary whims of larger nations. The EU should develop and/or deepen scientific partnerships with nations such as Iceland, Norway, Switzerland, the UK, Ukraine, Canada, India, Japan, Singapore, South Korea, Australia and New Zealand. Infrastructure and platforms funded by Horizon, such as Gaia-X and the European Open Science Cloud, should, as appropriate, be open to such countries.

The EU must diversify its international relationships and dependencies in a context of severe geopolitical and economic disruption unprecedented since the 1930s. As a result, there must also be cooperation with friendly nations which may not always share our values domestically but which are respectful of EU interests and international stability. Relevant countries to collaborate with could include, for example, the Arab Gulf states, which are economically dynamic, increasingly host international scientific research and have a vested interest in the rules-based order.

As the Heitor report argues, R&I cooperation with other nations should be 'nuanced, granular and purpose-driven'.[28] The EU should actively pursue international cooperation in R&I while recognising that countries may be partners, competitors or systemic rivals in different scientific and technological domains. This requires a careful analysis of risks, such as technological leakage or empowering hostile states, and opportunities, such as enhancing R&I capabilities and reducing and diversifying dependencies.

Recommendations for securing multilateralism through R&I cooperation

- Continue to **develop and deepen Horizon Europe partnership agreements with friendly states**, including those with different political systems, provided these are stable, lawful and respectful of EU interests.
- **Develop infrastructure and platforms open to contributions and usage by friendly states**. Such infrastructure could include supercomputers, AI-for-research platforms and biomedical research infrastructure.

[28] European Commission, Directorate-General for Research and Innovation, *Align, Act, Accelerate*.

8. From brain drain to brain gain

Lee Kuan Yew, the late prime minister of Singapore, claimed that the single most important factor in the stupendous post-independence development of his country was the attraction and development of 'talent' as 'a country's most precious asset'.[29] Economists have long thought that human capital—valuable cognitive and non-cognitive skills, experience, health and other economically valuable human attributes—is crucial to economic development and productivity.[30] The Organisation for Economic Co-operation and Development has estimated that a significant part of the productivity slowdown in developed economies over the last decades may be due to the deceleration in human capital growth.[31]

As nations develop, the skills required in more advanced sectors become steadily more complex. The importance of human capital is particularly obvious in science and innovation as cognitively demanding and skill-intensive fields. EU science policy has a critical role to play in developing European talent and attracting the best researchers from around the world.

As the Draghi report notes, while EU universities are solid performers overall, they are underrepresented among top academic institutes in global rankings.[32] This places the EU at a disadvantage in fields in which attracting and retaining top performers is critical to future breakthroughs. In addition, the EU suffers from brain drain of researchers, especially to the US. In a world of geopolitical uncertainty and the rise of governments—in the US, Russia and elsewhere—remarkably repellent to many scientists, **the EU has an opportunity to become a global epicentre of brain gain**. The EU should develop, within Horizon Europe and other programmes, specific initiatives to retain native talent and attract talent from overseas.

Such programmes should provide a safe haven for alienated scientists abroad and even encourage immigration to the EU of top talent from systemic rivals. Horizon should create a 'Sakharov Fellowship' to welcome top talent as scientific refugees. With an immeasurably higher quality of life, respect for human dignity and scientific production than states such as Belarus and Russia, the EU should

29 K. Y. Lee, *From Third World to First: The Singapore Story: 1965–2000* (New York: Harper, 2000), 135–144.

30 D. Susskind, *Growth: A History and a Reckoning* (Cambridge, MA: Belknap, 2024).

31 D. Andrews, B. Égert and C. de la Maisonneuve, *From Decline to Revival: Policies to Unlock Human Capital and Productivity*, OECD Economics Department Working Papers No. 1827 (2024).

32 M. Draghi, *Future of European Competitiveness*, Part B, 240.

be a magnet for human capital from such dysfunctional autocracies. With the right security screening in place, such immigration is one of the single best ways to weaken hostile states while bolstering the capacities and moral appeal of the EU.

Recommendations for brain gain

- Encourage member states and provide funding to **upgrade at least 10 of the EU's leading universities into top 50 global universities by 2035** (as measured by rankings such as the Nature Index), to be competitive with top US and UK universities. This should be complementary to widening initiatives seeking to geographically broaden research excellence.

- Develop a '**Choose Europe**' **programme to incentivise universities to provide permanent employment to post-doctoral researchers**. This programme should target high-performing STEM researchers most likely to emigrate, with a focus on KETs, as well as European researchers abroad liable to return to the EU through circular migration.

- Establish a 'Sakharov Fellowship' **encouraging scientific refugees from systemic rivals** and dysfunctional autocracies.

9. Envisioning a human-centric future with transformational technologies

We are living in an era of unprecedented technological change. Rapid developments in AI, biotechnologies, virtual reality and other technologies are raising fundamental questions about basic aspects of our day-to-day life. Trends such as the automation of white-collar work, the epistemic challenge of AI-generated content and algorithmic curation, and new modes of reproduction such as embryo selection and artificial wombs pose many questions which policymakers are currently poorly equipped to answer.

For instance, no one can say today what education or work may or should plausibly look like in 10 or 20 years, nor can we predict with precision the opportunities and threats new technologies will bring. Creative and long-termist thinking will be needed to determine how best to use and socially adapt to transformative technologies to enable human flourishing. Policymakers will need conceptual

tools, alternative scenarios and policy options to be able to react appropriately and make the most of new technologies, while managing risk.

Horizon should then embed ethical frameworks and foresight activities in relevant calls and should finance projects specifically investigating the philosophical, societal, policy and futuristic aspects of transformative technologies. These may feature interdisciplinary teams including STEM researchers, philosophers and other humanists, practitioners and policymakers.

These activities should avoid precautionary bias by both investigating the risks of such technologies and creatively and constructively exploring the potentially radical positive implications and options for societal adaptation. Above all, we need imagination and open-mindedness to best build the world which is coming by fully harnessing the potential of technology for sustainability and human flourishing.

Recommendations for envisioning a human-centric future

- Embed ethics and foresight activities in relevant Horizon calls.
- **Fund projects investigating the ethical, legal and social issues of transformative technologies** (AI, virtual reality, biotech and so on) to provide policy recommendations and options for human-centric adoption and societal adaptation.

Policy recommendations

1. Close the innovation loop

- Urgently act upon the pro-competitiveness recommendations of the Draghi report. These include **eliminating barriers within the single market for innovation-intensive sectors** such as data, capital markets, pharmaceuticals and biotech, and defence.
- **Embrace an 'innovation-in-all-policies approach'** by systematically assessing the current and potential impact of policies at all levels in the innovation cycle.

2. Empower scientists

- **Maintain Horizon as a standalone programme.**
- Support curiosity-driven science by the best research teams.
- Make calls less prescriptive for basic research, and simplify reporting requirements.
- Implement a 'trust first, evaluate later' model to streamline application processes.
- Expand the use of lump sum grants to reduce administrative costs.

3. Unlock KETs

- **Support research infrastructure for KETs**, such as pilot lines, digital and data infrastructure, clean-room fabrication hubs and biofoundries.
- **Refocus post-2030 Missions beyond 2030 on KETs**, prioritising objectives such as achieving EU autonomy on AI, space, critical medicines and dual-use technologies such as drones.

4. Enable dual-use R&I

- **Avoid labelling research areas as dual-use within Horizon Europe**, while giving the Commission discretion to limit cooperation with particular countries for sensitive projects.
- Design European Defence Agency projects to leverage EU and national civil research for defence applications, and design Horizon Europe projects to leverage increased EU and national defence research for civil applications.

5. Empower business and better reflect market demand

- **Enhance co-financing mechanisms** to ensure private actors have skin in the game.
- Ensure research infrastructures serve both academia and industry, with modulated fees for services to enable price mechanisms while facilitating access for small and medium-sized enterprises and startups.
- More proactively solicit industry group input when designing Horizon activities.

- Within the Marie Skłodowska-Curie Actions, increase the share of industrial fellowships, and encourage industry placements in key technological sectors.

6. Unify markets through standardisation

- **Embed standardisation in R&I calls**, such as through standards impact assessments and work packages funding participation in standardisation bodies.
- **Maximise the Brussels Effect** by setting standards that can be emulated by third-country actors, and, where relevant, make standardisation projects open to third-country participation.

7. Secure multilateralism

- Continue to **develop and deepen Horizon Europe partnership agreements with friendly states**, including those with different political systems, provided these are stable, lawful and respectful of EU interests.
- **Develop mega-projects and infrastructure open to contributions and usage by friendly states**. Such infrastructure could include supercomputers, AI-for-research platforms and biomedical research infrastructure.

8. Maximise brain gain

- Encourage member states and provide funding to **upgrade at least 10 of the EU's leading universities into top 50 global universities by 2035** (as measured by rankings such as the Nature Index), to be competitive with top US and UK universities. This should be complementary to increasing initiatives seeking to geographically broaden research excellence.
- Develop a **'Choose Europe' programme to incentivise universities to provide permanent employment to post-doctoral researchers**. This programme should target high-performing STEM researchers most likely to emigrate, with a focus on KETs, as well as European researchers abroad liable to return to the EU through circular migration.
- Establish a 'Sakharov Fellowship' encouraging scientific refugees from systemic rivals and dysfunctional autocracies.

9. Envisioning a human-centric future

- Embed ethics and foresight activities in relevant Horizon calls.
- **Fund projects investigating the ethical, legal and social issues of transformative technologies** (AI, virtual reality, biotech and so on) to provide policy recommendations and options for human-centric adoption and societal adaptation.

Bibliography

Andrews, D., Égert, B. and de la Maisonneuve, C., *From Decline to Revival: Policies to Unlock Human Capital and Productivity*, OECD Economics Department Working Papers No. 1827 (2024), accessed at https://doi.org/10.1787/8d0d232c-en.

Bradford, A., *The Brussels Effect: How the European Union Rules the World* (Oxford: Oxford University Press, 2019).

Chryssogelos, A., *European Sovereignty Between Autonomy and Dependence: A Guide for EU Policy*, Wilfried Martens Centre for European Studies (Brussels, 22 June 2023), accessed at https://www.martenscentre.eu/publication/european-sovereignty-between-autonomy-and-dependence-a-guide-for-eu-policy/.

Draghi, M., 'Presentation of the Report on the Future of European Competitiveness', address by Mr. Draghi to the European Parliament, Strasbourg, 17 September 2024.

Draghi, M., *The Future of European Competitiveness—A Competitiveness Strategy for Europe* (Brussels, 9 September 2024), accessed at https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en.

Elert, N., Henrekson, M. and Stenkula, M., *Institutional Reform for Innovation and Entrepreneurship: An Agenda for Europe* (New York: Springer, 2017), accessed at https://doi.org/10.1007/978-3-319-55092-3.

Else, H. and Van Noorden, R., 'The Fight Against Fake-Paper Factories That Churn Out Sham Science', *Nature*, 591/7851 (2021), 516–19, accessed at https://doi.org/10.1038/d41586-021-00733-5.

European Commission, *A European Strategy for Key Enabling Technologies – A Bridge to Growth and Jobs*, COM (2012) 341 final (26 June 2012), accessed at https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM%3A2012%3A0341%3AFIN%3AEN%3APD.

European Commission, *Implementation of the European Research Area (ERA): Strengthening Europe's Research and Innovation: The ERA's Journey and Future Directions*, COM (2024) 490 final (22 October 2024), accessed at https://research-and-innovation.ec.europa.eu/document/download/1bde0a38-7c86-4e6c-a4b8-7f9605d9e7e7_en?filename=com_2024_490_en.pdf.

European Commission, *List of Participating Countries in Horizon Europe* (20 August 2025), accessed at https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf.

European Commission, Directorate-General for Research and Innovation, Align, Act, Accelerate – Research, Technology and Innovation to Boost European Competitiveness (2024), accessed at https://data.europa.eu/doi/10.2777/9106236.

European Commission, Directorate-General for Research and Innovation, 'Scientific Knowledge Production', in European Commission, Directorate-General for Research and Innovation, *Science, Research and Innovation Performance of the EU 2024 Report* (Brussels, 2024), 149–229, accessed at https://ec.europa.eu/assets/rtd/srip/2024/ec_rtd_srip-report-2024-chap-03.pdf.

European Commission, High Representative of the Union for Foreign Affairs and Security Policy, *European Defence Readiness 2030*, White Paper, JOIN (2025) 120 final (19 March 2025), accessed at https://defence-industry-space.ec.europa.eu/document/download/30b50d2c-49aa-4250-9ca6-27a0347cf009_en.

Francica, E., 'MEPs' Vote Reinforces Push for a Standalone FP10,' *ScienceIBusiness*, 24 April 2025, accessed at https://sciencebusiness.net/news/planning-fp10/meps-vote-reinforces-push-standalone-fp10.

Karlson, N., Sandström, C. and Wennberg, K., 'Bureaucrats or Markets in Innovation Policy? A Critique of the Entrepreneurial State,' *The Review of Austrian Economics* 34 (April 22, 2020), 81–95, accessed at https://doi.org/10.1007/s11138-020-00508-7.

Kennedy, P., *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Random House, 1987).

Lee, K. Y., *From Third World to First: The Singapore Story: 1965–2000* (New York: Harper, 2000).

Lehto, O., *Evolution, Complexity, and Intelligence: The Methodological Foundations of Evolutionary Liberalism*, PhilArchive (2025), accessed at https://philpapers.org/archive/LEHECA-2.pdf.

Moran, B., 'Where Do MEPs Really Stand on Innovation Policy?', *Delta V*, 26 March 2025, accessed at https://www.deltavpublicaffairs.eu/blog/mep-innovation-policy.

Normile, D., China's Scientists Often Cite Work From Their Own Nation. Is That Skewing Global Research Rankings? *Science* (2024), accessed at https://doi.org/10.1126/science.zwtuywu.

Ramahandry, T. et al., *Key Enabling Technologies and Europe's Technological Sovereignty*, European Parliamentary Research Service (Brussels, December 2021), accessed at https://www.europarl.europa.eu/RegData/etudes/STUD/2021/697184/EPRS_STU(2021)697184_EN.pdf.

Shi, L. et al., 'Mapping Retracted Articles and Exploring Regional Differences in China, 2012–2023', *PLOS One* 19/12 (2024), Article e0314622, accessed at https://doi.org/10.1371/journal.pone.0314622.

Susskind, D., *Growth: A History and a Reckoning* (Cambridge, MA: Belknap, 2024).

ScienceIBusiness, 'Think-Tank Calls for Market-Friendly Innovation Policy', 24 October 2007, accessed at https://sciencebusiness.net/news/71517/Think-tank-calls-for-market-friendly-innovation-policy.

Walshe, G., *Freedom Must Be Better Armed Than Tyranny: Boosting Research and Industrial Capacity for European Defence*, Wilfried Martens Centre for European Studies (Brussels, November 2023), accessed at https://www.martenscentre.eu/wp-content/uploads/2023/11/Martens-Centre-Policy-Brief.pdf.

Willy, C., 'Closing the Gap Between Science and Politics: A European View,' *Global Policy*, 5 December 2022, accessed at https://www.globalpolicyjournal.com/blog/05/12/2022/closing-gap-between-science-and-politics-european-view.

Woolley, A. W. et al., 'Evidence for a Collective Intelligence Factor in the Performance of Human Groups', *Science*, 330/6004 (2010), 686–8, accessed at https://doi.org/10.1126/science.1193147.

Credits

The Wilfried Martens Centre for European Studies is the political foundation and think tank of the European People's Party (EPP), dedicated to the promotion of Christian Democrat, conservative and like-minded political values.

Wilfried Martens Centre for European Studies
Rue du Commerce 20
Brussels, BE 1000

For more information, please visit www.martenscentre.eu.

External editing: Communicative English bv
Typesetting: Victoria Agency

This publication receives funding from the European Parliament.